THE

ZOOLOGICAL RECORD

FOR 1872;

785

BEING

VOLUME NINTH

OF THE

RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY

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'Explorate solum: sic fit via certior ultr

BOOK NO.
1152

LONDON:

JOHN VAN VOORST, PATERNOSTER ROW.

M.DCCC.LXXIV.

Acc. No. 230
dt. 20.11.06

Acc. No. - 230
20/11/06

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

591-05
GUN

PREFACE.

Again I have to introduce to the zoological public another volume of this work, and the last with which I shall have the honour of being connected. When, in 1870, I accepted the Editorship of the present Annual, I did so simply in the hope that I might be enabled to continue what all who had knowledge of it agreed in regarding as a great help to working zoologists; though circumstances, sufficiently explained in the preface to Volume VII., rendered it not unlikely that the undertaking might come to a sudden stop. That hope, through the generous support I received, was abundantly fulfilled; but I never intended to retain the office of Editor, which I knew would be onerous enough, after I had secured the services of a willing and competent successor.

Such a successor I happily found in Mr. Rye, who has most admirably discharged the duties of Subeditor of this and the preceding volume. Being fully assured of his fitness for the task which he expressed his readiness to perform, I, more than a year ago, tendered my resignation of the Editorship to the Council of the Zoological Record Association; and this resignation being accepted in a manner very gratifying to me, I had the further satisfaction of seeing Mr. Rye appointed in my room.

That under his management the Zoological Record will maintain the distinguished position it has from the first assumed I have no doubt: but I feel it to be my duty to entreat all who are interested in its welfare to continue their support to the undertaking; for the time is approaching (if not already arrived) when it must stand unaided by the liberal subsidies by which it has hitherto been encouraged.

Once more I have the pleasure of acknowledging a grant of £100 towards the expenses of the volume from the British Association for the Advancement of Science, and of a contribution of £58 11*s.* 10*d.* (the interest of the Davis Bequest) from the Council of the Zoological Society of London. I have again to return my thanks to the Subeditor and the various Recorders —among whom I have been so fortunate as to enlist Dr. Lütken—for their kind and invaluable cooperation. It will always be a satisfaction to me that I have had the honour of conducting, now for the space of three years, a publication so useful and (thanks entirely to my fellow-labourers) so ably executed as the Zoological Record.

ALFRED NEWTON.

Magdalene College, Cambridge,
April, 1874.

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

LIST OF THE

PRINCIPAL ABBREVIATED TITLES OF JOURNALS

QUOTED IN THIS VOLUME.

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

Abh. Ges. Nürnb.—Abhandlungen der naturhistorischen Gesellschaft zu Nürnberg.

Abh. schles. Ges.—Abhandlungen der schlesischen Gesellschaft für vaterländische Cultur.

Abh. Ver. Brem.—Abhandlungen herausgegeben vom naturwissenschaftlichen Vereine zu Bremen.

Abh. Ver. Hamb.—Abhandlungen herausgegeben von dem naturwissenschaftlichen Verein zu Hamburg.

Act. Lund.—Acta Universitatis Lundensis.

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

Act. Soc. L. Bord.—Actes de la Société Linnéenne de Bordeaux.

Alb. Nat.—Album der Natuur.

Am. J. Conch.—American Journal of Conchology.

Am. J. Sc. (3).—American Journal of Science and Art. Third series.

Am. Nat.—American Naturalist.

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

Ann. Ent. Belg.—Annales de la Société entomologique de Belgique.

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

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

Ann. Mus. Nap.—Annuario del Museo zoologico della R. Università di Napoli.

Ann. N. H. (4).—Annals and Magazine of Natural History. Fourth Series.

Ann. Sci. Géol.—Annales des Sciences Géologiques.

Ann. Sc. Nat. (5).—Annales des Sciences Naturelles. 5me Série.

Ann. Soc. Ent. Fr. (5).—Annales de la Société entomologique de France. 5me Série.

Ann. Soc. Esp.—Anales de la Sociedad Española de Historia Natural.

Ann. Soc. L. Lyon.—Annales de la Société Linnéenne de Lyon.

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

Arch. Anat. Phys.—Archiv für pathologische Anatomie und Physiologie.
Arch. Antr. Etn.—Archivio dell' Antropologia e la Etnologia.
Arch. f. Nat.—Archiv für Naturgeschichte.
Arch. Landesdurchf. Böhm.—Archiv für die naturwissenschaftliche Landesdurchforschung von Böhmen.
Arch. mikr. Anat.—Archiv für mikroskopische Anatomie.
Arch. Néerl. (and *Arch. sci. nat.*).—Archives Néerlandaises des Sciences exactes et naturelles.
Arch. path. Anat.—Archiv für pathologische Anatomie und Physiologie.
Arch. Tr. Orl. Co. Soc.—Archives of Science and Transactions of the Orleans County Society of Natural Sciences.
Arch. Ver. Mecklenb.—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
Arch. Z. Par. (and *Arch. Z. expér.*).—Archives de Zoologie expérimentale et générale.
Atti Acc. Nap.—Atti dell' Accademia di scienze fisiche e mathematiche di Napoli.
Atti Acc. Tor.—Atti della R. Accademia delle scienze di Torino.
Atti Soc. Ital.—Atti della Società Italiana di scienze naturali.
Atti Soc. Pad.—Atti della Società Veneto-Trentina di scienze naturali.

Berl. klin. Woch.—Berliner klinische Wochenschrift.
Ber. senck. Ges.—Bericht der senckenbergischen naturforschenden Gesellschaft.
Ber. St. Gal. Ges.—Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft.
B. E. Z.—Berliner entomologische Zeitschrift.
Bull. Ac. Belg. (2).—Bulletin de l'Académie Royale des Sciences de Belgique. 2me Série.
Bull. Congr. Arch.—Bulletin du Congrès International d'Archéologie préhistorique (Copenhagen).
Bull. Ent. Ital.—Bullettino della Società Entomologica Italiana.
Bull. Mal. Belg.—Bulletin des séances de la Société malacologique de Belgique.
Bull. Mosc.—Bulletin de la Société impériale des Naturalistes de Moscou.
Bull. Mus. C. Z.—Bulletin of the Museum of Comparative Zoölogy (Cambridge, U.S.A.).
Bull. Pétersb.—Bulletin de la classe physico-mathématique de l'Académie impériale des Sciences de St. Pétersbourg.
Bull. Soc. Ent. Fr.—Bulletin des séances de la Société entomologique de France.
Bull. Soc. L. Norm.—Bulletins de la Société Linnéenne de Normandie.
Bull. Soc. Vaud.—Bulletin de la Société Vaudoise des Sciences Naturelles.
Bull. Soc. Vétér.—Bulletin de la Société centrale de Médecine Vétérinaire.

Canad. Ent.—Canadian Entomologist.
Cat. Mus. C. Z.—Illustrated Catalogue of the Museum of Comparative Zoölogy (Cambridge, U. S. A.).
CB. Ver. Regensb.—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg.
CB. Ver. Riga.—Correspondenz-Blatt des Naturforscher-Vereins in Riga.
C. H.—Coleopterologische Hefte.

Cist. Ent.—Cistula Entomologica.
C. R. (and *CR. Ac. Sci.*).—Comptes Rendus de l'Académie des Sciences.
CR. Ent. Belg.—Comptes-rendus des séances de la Société entomologique de Belgique.
CR. Soc. Rouen.—Comptes rendus de la Société des Amis des Sciences naturelles de Rouen.

Dan. Selskr. Skr.—K. Danske Videnskabernes Selskabs Skrifter.
Denk. Ak. Wien.—Denkschriften der k. Akademie der Wissenschaften zu Wien.

Ent.—The Entomologist.
Ent. Ann.—The Entomologist's Annual.
Ent. M. M.—Entomologist's Monthly Magazine.

Forh. Selsk. Chr.—Forhandlinger i Videnskabs-Selskabet i Christiania.

Geogr. MT.—Mittheilungen aus Justus Perthes' geographischer Anstalt &c.
Geol. Mag.—Geological Magazine.

Hor. Ent. Ross.—Horæ Societatis Entomologicæ Rossicæ.

Ibis.—The Ibis.
Izvest. Obsh. Iest. Mosk.—Izvestia Imperatorskeio Obshtshestra Ljubiteloi Iestestvasnanija (Trans. Imp. Soc. Nat. Sci. Moscow).

J. Anat. Phys.—Journal of Anatomy and Physiology.
J. A. S. B.—Journal of the Asiatic Society of Bengal.
JB. Ges. Hannov.—Jahresbericht der naturforschenden Gesellschaft in Hannover.
JB. schles. Ges.—Jahresbericht der schlesischen Gesellschaft für vaterländische Cultur.
J. de Conch.—Journal de Conchyliologie.
J. de l'Anat. Phys.—Journal de l'anatomie et de la physiologie.
Jen. Z. Nat.—Jenaische Zeitschrift für Medicin und Naturwissenschaft.
J. f. O.—Journal für Ornithologie.
J. G. Soc.—Quarterly Journal of the Geological Society.
JH. Ver. Württ.—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg.
J. L. S.—Journal of the Linnean Society.
J. Mus. Goddefr.—Journal des Museum Goddefroy: Geographische, ethnographische und naturwissenschaftliche Mittheilungen.
Jorn. Sc. Lisb.—Jornal de Sciencias da Academia de Lisboa.
J. R. Dubl. Soc.—Journal of the Royal Dublin Society.
J. Zool.—Journal de Zoologie.

L'Ab.—L'Abeille.

Madras M. M. J.—Madras Monthly Journal of Medical Science.
Mal. Bl.—Malakozoologische Blätter.

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

Med. Chir. Rev.—Medico-Chirurgical Journal and Review.

Med. Times.—Medical Times and Gazette.

Mél. Biol.—Mélanges biologiques tirés du Bulletin de la classe physico-mathématique de l'Académie Impériale des Sciences de St. Pétersbourg.

Mém. Ac. Belg.—Mémores de l'Académie Royale des Sciences de Belgique.

Mém. Ac. Montp.—Mémoires de l'Académie des sciences et lettres de Montpellier.

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

Mem. Ist. Lomb.—Memorie del R. Istituto Lombardo di scienze.

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

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

Mém. Pétersb.—Mémoires de l'Académie impériale des Sciences de St.-Pétersbourg.

Mém. Soc. Cherb. (2).—Mémoires de la Société des sciences naturelles de Cherbourg. 2me Série.

Mém. Soc. Lille.—Mémoires de la Société des sciences &c. de Lille.

Mém. Soc. L. Norm.—Mémoires de la Société Linnéenne de Normandie.

Mém. Soc. Oise.—Mémoires de la Société académique du département de l'Oise.

Mém. Soc. Phys. Genève.—Mémoires de la Société de physique et d'histoire naturelle de Genève.

M. Micr. J.—Monthly Microscopical Journal.

MT. anthr. Ges. Wien.—Mittheilungen der anthropologische Gesellschaft zu Wien.

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

MT. schw. ent. Ges.—Mittheilungen der schweizerischen entomologischen Gesellschaft.

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

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

Nachr. mal. Ges.—Nachrichtsblatt der deutschen malako-zoologischen Gesellschaft.

N. Arch. Mus.—Nouvelles Archives du Muséum d'Histoire Naturelle.

Nat. Mex.—La Naturaleza.

Nat. Tids.—Naturhistorisk Tidsskrift.

Nature.—Nature.

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

N. Mag. Naturv.—Nyt Magazin for Naturvidenskaberne.

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

Nouv. et Faits.—Nouvelles et Faits divers.

Nouv. Mém. Soc. Helvét.—Neue Denkschriften der allgemeinen schweizerischen Gesellschaft für die gesammten Naturwissenschaften.

Œfv. Ak. Förh. (and *Œfv. Vet. Ak.*).—Œfversigt af K. Vetenskaps Akademiens Förhandlingar.

Overs. Dan. Selsk.—Oversigt over det K. Danske Videnskabernes Selskabs Forhandlinger.

P. Ac. Philad.—Proceedings of the Academy of Natural Sciences of Philadelphia.
P. A. S. B.—Proceedings of the Asiatic Society of Bengal.
P. Bost. Soc.—Proceedings of the Boston Society of Natural History.
P. Cal. Ac.—Proceedings of the California Academy of Sciences.
P. E. Soc.—Proceedings of the Entomological Society of London.
Pet. Nouv.—Petites Nouvelles Entomologiques.
Phil. Tr.—Philosophical Transactions of the Royal Society.
P. N.-Scot. Inst.—Proceedings and Transactions of the Nova-Scotian Institute of Natural Sciences.
Pollich.—Jahresbericht der Pollichia.
Pop. Sc. Rev.—The Popular Science Review.
P. R. Soc.—Proceedings of the Royal Society.
P. R. Soc. Edinb.—Proceedings of the Royal Society of Edinburgh.
P. R. Soc. Maur.—Proceedings of the Royal Society of Arts and Sciences of Mauritius.
P. Soc. Dubl.—Proceedings of the Natural-History Society of Dublin.
P. Z. S.—Proceedings of the Zoological Society.
P. Zool. Soc. Vict.—Proceedings of the Zoological and Acclimatization Society of Victoria.

Q. J. Micr. Sc.—Quarterly Journal of Microscopical Science.

Rec. Am. Ent.—Record of American Entomology.
Rendic. Acc. Nap.—Rendiconti dell' Accademia di scienze fisiche e matematiche di Napoli.
Rend. Ist. Lomb.—Rendiconti del R. Istituto Lombardo di scienze &c.
Rep. Am. Ass.—Proceedings of the American Association for the Advancement of Science.
Rep. Br. Ass.—Report of the British Association for the Advancement of Science.
Rep. Ins. Mass.—Annual Report on the Injurious and Beneficial Insects of Massachusetts.
Rep. Ins. Mo.—Annual Report on the noxious, beneficial, and other Insects of the State of Missouri.
Rep. N.-York Cab.—Annual Report of the New-York State Cabinet of Natural History.
Rep. Peab. Ac.—Annual Report of the Trustees of the Peabody Academy of Arts and Sciences.
Rev. Montp.—Revue des Sciences Naturelles (Montpellier).
R. Z.—Revue et Magasin de Zoologie pure et appliquée.

SB. Ak. Wien.—Sitzungsberichte der mathemat.-naturwiss. Classe der Akademie der Wissenschaften zu Wien.
SB. bayer. Ak.—Sitzungsberichte der k. bayerischen Akademie der Wissenschaften.
SB. Ges. Marb.—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
SB. nat. Fr.—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.
SB. Soc. Erlang.—Sitzungsberichte der physicalish-medicinischen Societät zu Erlangen.

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

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

Schr. Ges. Danz.—Neueste Schriften der naturforschenden Gesellschaft zu Danzig.

Schr. Ges. Marb.—Schriften der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.

Sci. Goss.—Science Gossip.

Scot. Nat.—The Scottish Naturalist.

S. E. Z.—Stettiner entomologische Zeitung.

Str. F.—Stray Feathers.

Sv. Ak. Handl.—K. Svenska Vetenskaps-Akademiens Handlingar.

TB. Vers. Natur.—Tageblatt der Versammlung deutscher Naturforscher und Aerzte.

Term. Közl.—Természettudományi Közlemének.

Tijdschr. Ent.—Tijdschrift voor Entomologie.

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

Tr. Am. Phil. Soc.—Transactions of the American Philosophical Society.

Tr. Ent. Soc. N. S. W.—Transactions of the Entomological Society of New South Wales.

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

Tr. L. S.—Transactions of the Linnean Society.

Tr. North. Durh.—Natural-History Transactions of Northumberland and Durham.

Tr. Norw. Soc.—Transactions of the Norfolk and Norwich Naturalists' Society.

Tr. N. Z. Inst.—Transactions and Proceedings of the New-Zealand Institute.

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

Tr. Z. S.—Transactions of the Zoological Society.

VB. westph. rheinl. Ver. Bien. Seidenz.—Vereinsblatt des westphalischen rheinlandischen Vereins für Bienen und Seidenzucht.

Ver. Berl. Ges. Anthropol.—Verhandlungen der Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte.

Verh. Ges. Bas.—Verhandlungen der naturforschenden Gesellschaft in Basel.

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

Verh. schw. Ges.—Verhandlungen der schweizerischen naturforschenden Gesellschaft.

Verh. Utr. Gen.—Natuurkundige Verhandelingen uitgeven door het provinciaal Utrechtsch Genootschap van Kunsten en Wetenschappen.

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

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

Versl. Akad. Amst.—Verslagen en Mededeelingen der k. Akademie van Wetenschappen.

Vid. Medd.—Videnskabelige Meddelelser fra den Naturhistoriske Forening.

Württ. nat. JH.—Württembergische naturwissenschaftliche Jahreshefte.
Würzb. nat. Z.—Würzburger naturwissenschaftliche Zeitschrift.

Z. Ethnol.—Zeitschrift für Ethnologie.
Z. Ferd.—Zeitschrift des Ferdinandeums.
Z. ges. Naturw. (2).—Zeitschrift für die gesammten Naturwissenschaften. Neue Folge.
Zool. Gart.—Der zoologische Garten.
Zool. Rec.—Record of Zoological Literature (and Zoological Record).
Zool. s. s.—The Zoologist. Second Series.
Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie.

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Acc no. 230
dt. 20.11.06

ZOOLOGICAL RECORD

FOR 1872.

MAMMALIA

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

THE GENERAL SUBJECT.

a. Separate Publications.

DARWIN, C. The Expression of the Emotions in Man and Animals. London: 1872. 16mo, pp. 374, with photographic and other illustrations.

Chapters iv. and v. bring this work within the scope of the Mammalian portion of the 'Zoological Record.' In the first of these chapters the author treats of the means of expression in animals, such as the emission of sounds produced by the vocal organs or otherwise, the erection of dermal appendages and hairs under the emotions of anger and terror; the drawing back of the ears as a preparation for fighting; the erection of the ears and raising the head as a sign of attention. In the fifth chapter the special expressions of various animals (dogs, cats, horses, ruminants, and monkeys) are discussed (pp. 83–146).

——. The Origin of Species by means of Natural Selection, or the preservation of favoured Races in the struggle for Life. Sixth edition, with additions and corrections. London: 1872. 16mo, pp. 458.

Beside small corrections and additions, some of greater importance have been made in the fifth and sixth editions. For

the convenience of those who have studied previous editions the latter are tabulated by the author on p. xii. The author enters in the present edition into an examination of the arguments brought forward in Mivart's 'Genesis of Species.'

Houzeau, J. C. Études sur les Facultés mentales des animaux comparées à celles de l'homme. Mons: 1872. 8vo, vol. i. pp. 364; vol. ii. pp. 644.

Milne-Edwards, H. & A. Recherches pour servir à l'histoire naturelle des Mammifères. Paris: 4to.

See Zool. Record, v. p. 3, vi. p. 2, and viii. p. 2. Six more parts (nos. 10–15, to p. 304) have been issued. They contain the conclusion of the account of the Mammalian fauna of China, which is followed by a description of the Mammals of Tibet.

Schmidt, M. Zoologische Klinik. Handbuch der vergleichenden Pathologie und pathologischen Anatomie der Säugethiere und Vögel. Bd. I. Abtheil. 2. Die Krankheiten der Raubthiere. [The diseases of Carnivora.] Berlin: 1872. 8vo. [*Cf.* Zool. Record, vii. p. 4.]

β. *Anatomy and Physiology.*

Alix, E. Sur l'existence du nerf dépresseur chez l'Hippopotame. Journ. Zool. 1872, pp. 279, 280. [See Zool. Rec. viii. p. 4. Cyon, E.]

——. Sur la glande parotide de l'Hippopotame. *Ibid.* pp. 470, 471.

Chatin, J. Observations sur la myologie de l'*Hyæmoschus*. Ann. Sc. Nat. xv. 1872, pp. 32, pls. 7–9.

Dietl, M. J. Untersuchungen über Tasthaare. Wien. Sitzgsber. 1871, lxiv. pp. 62–76, with 2 plates.

Eimer, Th. Die Schnautze des Maulwurfs als Tastwerkzeug. Arch. mikr. Anat. vii. pp. 181–191, Taf. 17. [The snout of the mole as an instrument of touch.]

Ercolani, —. De la portion maternelle du placenta chez les Mammifères. Journ. Zool. 1872, pp. 472–480, pl. 24.

This is an abstract of the memoir which has been published in Mem. Ac. Bologn.

Flower, W. H. Lectures on the Comparative Anatomy of the Organs of Digestion of the Mammalia. Delivered at the Royal College of Surgeons of England in February and March 1872. Published in the 'Medical Times and Gazette,' 1872, Nos. 1130 (Feb. 24th), 1132, 1134, 1136,

1138, 1140, 1142, 1144, 1146, 1149, 1151, 1153, 1157, 1160, 1162, 1164, 1170, 1172 (Dec. 11th).

Contain a description of the principal modifications of the mouth, tongue, salivary glands, alimentary canal, liver, and pancreas of the various groups of mammals, illustrated with forty woodcuts. Particular attention is given to the form of the liver, and a new arrangement of the lobes and fissures of this organ proposed, by which the homologous parts are readily recognized and described throughout the series. In the typical mammalian liver the principal lobes are named *left lateral, left central, right central, right lateral, spigelian,* and *caudate,* and the fissures the *portal, umbilical, left lateral, right lateral,* and *caudate.* Among other new points the liver of the gorilla is shown to differ from that of the other anthropoid apes in having well-marked lateral fissures, as in the lower monkeys: also a parotid salivary gland in the seal is described.

GERVAIS, P. Mémoire sur les formes cérébrales propres à différents groupes de Mammifères. Journ. Zool. 1872, pp. 425–469, pls. 20–23.

The author treats of the forms of brain obtained by means of casts of the cerebral cavity of various fossil Mammals, and of the brains of Insectivora, Chiroptera, and Rodents.

GILLETTE, —. Description et structure de la Tunique musculaire de l'œsophage chez l'homme et chez les animaux. Journ. de l'Anat. Phys. 1872, pp. 617–644.

GOTTSTEIN, J. Ueber den feineren Bau und die Entwicklung der Gehörschnecke der Säugethiere und des Menschen. Arch. mikr. Anat. viii. pp. 145–199, Taf. 6–8.

HAUGHTON, S. On some elementary principles in Animal Mechanics. No. VI. Theory of Skew Muscles, and investigation of the conditions necessary for maximum work. Proc. Roy. Soc. 1872, pp. 330–332.

HYRTL, J. Das Nierenbecken der Sæugethiere und des Menschen. Denkschr. Ak. Wiss. Wien, xxxi. 1872, pp. 107–140, with 7 plates.

The method followed by the author is to inject the kidneys from the ureter, and after the injected mass has been hardened, to destroy the renal substance with concentrated muriatic acid.

KÖLLIKER, A. Dritter Beitrag zur Lehre von der Entwicklung der Knochen. Berl. klin. Wochenschrift, 1872, pp. 258–273. [Third contribution to the theory of the growth of bones.]

LIEBERKÜHN, L. Ueber das Auge des Wirbelthier-Embryo. Cassel: 1872. 8vo (with 11 plates).

Macalister, A. The Myology of the *Chiroptera*. Proc. Roy. Soc. 1872, pp. 94, 95 (abstract); Philos. Trans. 1872, pp. 125–172, pls. 13–16.

——. Further observations on the myology of *Sarcophilus ursinus*. A. & M. N. H. 1872, x. pp. 17–20.

——. The muscular anatomy of the Koala. *Ibid.* pp. 127–134.

Nuel, —. Beitrag zur Kenntniss der Säugethier-Schnecke. Arch. mikr. Anat. viii. pp. 200–215, Taf. 9 & 10.

Ogle, J. W. On hereditary transmission of structural peculiarities. Med.-Chir. Rev. April 1872, pp. 25.

Pritchard, U. On the structure and function of the rods of the cochlea in Man and other Mammals. Proc. Roy. Soc. 1872, pp. 370–272 (abstract).

Robinski, —. Zur Anatomie, Physiologie und Pathologie der Augenlinse des Menschen und der Wirbelthiere. Arch. Anat. Phys. 1872, pp. 178–205, Taf. 7.

Sanson, A. Mémoire sur la théorie du développement précoce des animaux domestiques. Journ. de l'Anat. Phys. 1872, pp. 113–159, pls. 7 & 8.

Schöbl, J. Das äussere Ohr der Mäuse als wichtiges Tastorgan. Arch. mikr. Anat. vii. pp. 260–268, Taf. 21–24. [The external ear of Mice an important organ of touch.]

——. Die Flughaut der Fledermäuse, namentlich die Endigung ihrer Nerven. *Ibid.* pp. 1–31, Taf. 1–5. [The wings of Bats, especially the termination of their nerves.]

——. Das äussere Ohr des Igels als Tastorgan. *Ibid.* pp. 295–316, Taf. 14. [The external ear of the Hedgehog an organ of touch.]

Seeley, H. G. The origin of the Vertebrate Skeleton. A. & M. N. H. 1872, ix. pp. 265–280, x. pp. 21–45.

Stieda, L. Die angeblichen Terminal-Körperchen an den Haaren einiger Säugethiere. Arch. mikr. Anat. viii. pp. 274–278. [The alleged terminal corpuscles of the hairs of some Mammals.]—A reply by Schöbl, *ibid.* pp. 655–659.

γ. *Faunæ.*

Siberia. Mag. F. Schmidt has published a detailed report on the expedition undertaken to the lower parts of the Jenissei with the object of obtaining the body of a Mammoth known to have been found by the natives, and on the scientific results obtained during the expedition. Mém. Ac. Sc. St. Pétersb.

xviii. no. 1, 1872, pp. 168, with a map and five plates. The author gives an account of the physical geography of the country, and of all the circumstances connected with the locality in which the body of the Mammoth was found. On pp. 37–42 he enumerates 22 species of Mammalia collected by him, among them *Pteromys volans*, *Ægoceras montanus*, and *Moschus moschiferus*.

Denmark. Prof. Steenstrup mentions the following mammalian remains from Danish Kitchenmiddens:—*Bos primigenius* (skeleton, pl. 6), *Bos bison*, *Cervus alces*, *C. tarandus*, *C. elaphus*, *C. capreolus* (*C. giganteus*), *Sus scrofa*, *Canis lupus*, *C. domesticus*, *Ursus arctos*, *Felis catus*, *F. lynx*, and *Castor fiber*. Bull. Congrès Internat. d'Archéol. préhist. en 1869: Copenh. 1872, pp. 135–174.

Austria. In a paper entitled "Die vorgeschichtlichen Alterthümer der Stadt Olmütz und ihrer Umgebung," and published in Mittheil. anthropol. Ges. Wien, 1872, pp. 95, Prof. Jeitteles describes remains of *Cervus elaphus* and *C. dama*, *Lepus cuniculus*, *Sus scrofa*, *palustris*, and *domesticus*, *Bos taurus*, *Capra hircus*, *Ursus arctos*, and several varieties of Dog.

Sicily. Prof. P. Doderlein gives a sketch of the vertebrate fauna of Sicily. He enumerates about 60 mammals now found in the island, and, by comparing this fauna with that of the quaternary fauna, indicates the physical changes which must have taken place since that period. Ann. Soc. Mod. vi. 1872, pp. 60.

Nova Scotia. Dr. Gilpin has continued his observations on the Mammalian Fauna [see Zool. Rec. vii. p. 2], Proc. & Trans. N. Scot. Inst. Nat. Sc. 1872, iii. pp. 46–61 and pp. 109–125. These parts treat of *Lepus americanus*, *Cervus tarandus*, and *Cervus alces*. In conclusion, the author gives a list of the Nova-Scotian Mammals.

United States. Dr. Elliott Coues has published "Notes on the Natural History of Fort Macon, N.C., and vicinity. No. 1," in Proc. Ac. Nat. Sc. Philad. 1871, in which he enumerates, with notes, 18 Mammalia, pp. 12–18.

China and Tibet. A Report by the Abbé David of his travels in the western provinces of China is published in Nouv. Arch. Mus. vii. (1872), Bull. pp. 75–100, giving a list of 110 Mammals collected or observed by himself north of the Yangzekiang, of which more than 40 are referred to new species by A. Milne-Edwards, who has added very brief notes to those not previously described. The detailed descriptions of the species discovered (which will be noticed in the special part of this Record) are in 'Rech. Mammif.' (*suprà*, p. 2), accompanied by magnificent plates.

"Notes on Chinese Mammalia observed near Ningpo," by R. Swinhoe, P. Z. S. 1872, pp. 813–818.

India. In an "Account of a visit to the eastern and northern frontiers of Independent Sikkim. Part II. Zoology," Mr. W. T. Blanford publishes notes on the Mammalia of the Alpine and Subalpine Regions. J. A. S. B. 1872, pp. 30–41. The number of Mammals observed is 18.

For Capt. T. Hutton's account of the Bats of the North-western Himalayas, see below, p. 9.

Dr. Stoliczka has paid a visit to the province of Kachh [Cutch]. He makes general remarks on the physical features of the country, followed by notes on 28 Mammalia collected by him. J. A. S. B. 1872, pp. 211–229.

Central America. "On the Quadrumana found in America north of Panama," by P. L. Sclater, P. Z. S. 1872, pp. 2–9. Ten species, whose northern limits are pointed out.

Brazil. Dr. Hensel has continued his very valuable "Beiträge zur Kenntniss der Thierwelt Brasiliens," Zool. Garten, 1872, pp. 1–7, 33–39, 76–87, 151–154, 176–179 [see Zool. Rec. iv. p. 9, and vi. p. 7]. In these parts he treats of the Dogs, Rodents, and Edentata.

New Zealand. On Bats of New Zealand, F. W. Hutton & Knox, Trans. N. Z. Inst. iv. 1872, pp. 184–188.

QUADRUMANA.

Broca, P. L'ordre des Primates, parallèle anatomique de l'homme et des singes. Paris: 1870. 8vo.

Is known to the Recorder only from a notice in Arch. f. Nat. 1872, ii. p. 53, according to which the author adopts the view that man forms the first family of Primates.

Hamy, E. T. Contribution à l'étude du développement des lobes cérébraux des Primates. Arch. Zool. Expérim. 1872, pp. 429–436.

Simiidæ.

Simia satyrus. A case of abnormal dentition noticed by Peters, SB. ntrf. Freund. Berl. 1872, p. 76.

Troglodytes niger. E. H. Giglioli attempts to show in a very long paper, entitled "Studii craniologici sui Cimpanzé" (Ann. Mus. Civ. Genov. iii. pp. 56–179, pls. 7 & 8), that the Central-African Chimpanzee observed by Issel, Schweinfurth, and others [see Zool. Rec. vii. p. 7] is specifically distinct from that of the west coast, naming it *T. schweinfurthi*. Besides the example described by Issel, the author had one other skull, also four or five skulls of the west-coast Chimpanzee for comparison. [The differences pointed out by the author are of less significance than those observed between specimens from the west coast.]

R. Hartmann has examined the same subject, in a paper entitled "Beiträge zur zoologischen und zootomischen Kenntniss der sogenannten anthropomorphen Affen," in Arch. Anat. Phys. 1872 (partly published in 1873), pp. 107–152, Taf. 3 & 4, pp. 474–502, Taf. 6. This paper is not yet completed. In the parts published the author gives a history of our knowledge of the Chimpanzees generally, and then proceeds to a detailed examination of the skull, especially that of the "Bam-Chimpanzee of Central Africa."

Presbytes schistaceus. Note by Blanford, J. A. S. B. 1872, p. 32.

Macacus. A case of hybridism between *M. nemestrinus* and *M. cynomolgus* reported by T. G. Gentry, Philad. Proc. 1872, p. 122.

Macacus maurus. Description of the external and anatomical characters of this monkey, by Dr. Murie, P. Z. S. 1872, pp. 721–728, with woodcuts.

Macacus cyclopis. Distinctive specific characters, external as well as anatomical, pointed out by Dr. Murie, *l. c.* pp. 771–780, with woodcuts.

Macacus speciosus. Observations on its osteology and other parts of its anatomy, by Dr. Murie, *l. c.* pp. 780–787, with woodcuts.

Macacus brunneus (Anderson). Further remarks on its external characters and anatomy, by Anderson, P. Z. S. 1872, pp. 203–212, pl. 12. Is considered by Sclater to be identical with *M. arctoides* (Is. Geoffr.), *ibid.*, and likewise by Murie, *ibid.* pp. 770 & 771.

Macacus rufescens indicated as a new species by Anderson, *l. c.* p. 204, figured, p. 495, pl. 24.

Macacus rheso-similis, sp. n., Sclater, *l. c.* p. 495, pl. 25, is described at length by Anderson, *ibid.* pp. 529–533 (with figure of skull and skull of *Inuus rhesus*): may be *M. assamensis* (M'Clell.), Blyth, *ibid.* p. 532, note.

Macacus tcheliensis (A. M.-Edw.) = *M. lasiotus* (Gray). A. M.-Edwards, Rech. Mammif. p. 227, pls. 32, 33.

Macacus tibetanus described. *Id. l. c.* p. 244, pls. 34, 35.

Rhinopithecus, gen. nov. Type *Semnopithecus roxellanæ*. *Id. l. c.* p. 233, pls. 36, 37.

Cynocephalus hamadryas. On its myology, Macalister, A. & M. N. H. 1872, x. pp. 62–65.

Cebidæ.

On the species found north of Panama, see Sclater, P. Z. S. 1872, pp. 2–9.

Mycetes villosus and *M. caraya.* Heads figured, with notes. *Id. l. c.* p. 5.

Ateles. Prof. Reinhardt considers it improbable that two closely allied species should inhabit the same districts in Mexico or in Central America and thinks that the Mexican specimen in the Berlin Museum, named *A. melanochir*, should be again compared with *A. vellerosus.* He also shows that monkeys go further northward along the east coast of Central America than on the west coast. Vid. Medd. 1872, pp. 150–155 (see P. Z. S. 1872, p. 797).

Ateles ornatus and *A. albifrons* (Gray) are varieties of *A. melanochir*, according to Sclater, *l. c.* p. 4.

Ateles vellerosus (Gray) and *Ateles fusciceps* (Gray) figured by Sclater, *l. c.* pls. 2, 54.

Ateleles rufiventris, sp. n., Sclater, *l. c.* p. 688, pl. 57, Columbia.

Chrysothrix œrstedii is described as a new species by Reinhardt, *l. c.* pp. 155–158, tab. 3, Costa Rica. [Prof. Reinhardt is quite right in presuming that a specimen in the British Museum from Veragua, named *C. entomophaga*, belongs to this *C. œrstedi*, although it has neither the mouth so black *, nor the limbs so olive-coloured, as represented in the figure given by him. But, then, the British Museum possesses another example from Cosnipata, Peru, which has also the black head of *C. œrstedi*. Unfortunately it is rather young, and we cannot say whether it would have had with age the shining red coloration of the back and sides.]

Iacchus rufiventer is not from Mexico but Brazil. Sclater, *l. c.* p. 8.

Saimaris usta distinct from *S. sciurea*. Sclater, *l. c.* p. 688, with woodcut of head.

Nyctipithecus rufipes, sp. n., Sclater, *l. c.* p. 3, pl. 1, Nicaragua.

Lemuridæ.

Dr. Gray has revised the systematic division of the genera of this family, P. Z. S. 1872, pp. 846–860. He has come to the conclusion that the manifold variations of colour of *Propithecus* as well as *Indris* are not entitled to specific distinction. He figures *Prosimia rufipes*, pl. 69, *Opolemur* [*Chirogaleus*] *milii*, pl. 70, and *Chirogaleus typicus*, pl. 71; also the skulls of the two latter, *Azema smithi*, *Sciurochirus* (*Galago*) *alleni*, and *Otolicnus gabonensis*.

Prof. Gervais describes various forms of brain of this family. Journ. Zool. i. 1872, pp. 2–27, pl. 2.

Indris. These Lemurs vary much in coloration; a new variety is named *I. variegatus*. Gray, A. & M. N. H. 1872, x. p. 474.

Propithecus bicolor, described as a new species by Dr. Gray, A. & M. N. H. 1872, x. p. 206, is *P. edwardsi* (Grandidier), Sclater, *ibid.* p. 298.—The presumed species of this genus are mere varieties of colour, Gray, *ibid.* p. 474.—*Propithecus sericeus* described as a new species by Milne-Edwards and Grandidier, Rev. et Mag. Zool. 1872, p. 274. (*P. candidus*, Grandid., = *P. deckeni*, Peters.)

Lepilemur pallidicauda, sp. n., Gray, P. Z. S. 1872, p. 850.

Galago garnetti (Ogilb.) = *Otolemur agisymbanus* (Coquerel), Sclater, P. Z. S. 1872, p. 689.

Stenops tardigradus. Notes on a living example by Schmidt, Zool. Gart. 1872, pp. 52–54.

CHIROPTERA.

Prof. Macalister's memoir on the myology of Chiroptera has been noticed above, p. 4.

Schöbl, J. Die Flughaut der Fledermäuse, namentlich die Endigung ihrer Nerven. See above, p. 4.

* Prof. Reinhardt informs us in a letter that his artist has coloured this part too intensely black.

Capt. T. Hutton has given an account of the Bats of the North-western Himalayas in P. Z. S. 1872, pp. 690–714. He describes the following species:—*Pteropus edwardsi*, p. 691; *Cynopterus marginatus* (B. H.), p. 693; *Rhinolophus luctus* (Temm.), p. 694, *Rhinolophus affinis* (Horsf.), p. 696; *Rhinolophus rouxi* (Temm.), p. 697; *Rhinolophus ferrum-equinum*, p. 698; *Rhinolophus minor* (Horsf.), p. 698; *Rhinolophus macrotis* (Hodgs.), p. 699; *Rhinolophus petersi* (Dobson), p. 700; *Phyllorhina armiger* (Hodgs.), p. 700; *Phyllorhina bicolor* (Temm.), p. 702; Phyllorhina micropus (*sp. n.*), p. 703; *Barbastella communis*, p. 703; *Plecotus auritus*, p. 704; *Nycticejus luteus*, p. 706; *Vesperugo leisleri*, p. 707; *Vesperugo imbricatus* (Horsf.), p. 707; Vesperugo micropus (*sp. n.*), p. 708; *Miniopterus blepotis* (Temm.), p. 709; *Vespertilio blythi* (Tomes), p. 709; *Vespertilio adversus* (Horsf.), p. 710; *Kerivoula formosa*, p. 711; Harpyiocephalus huttonii (*sp. n.*), p. 711; Murina grisea (*sp. n.*), p. 712; *Megaderma lyra* (Geoffr.), p. 712.

Mr. G. E. Dobson has published "Notes on some species of Chiroptera collected by W. Theobold, Esq., in Barma [Burmah]," P. A. S. B. 1872, pp. 154–162. The species collected are:—*Cynonycteris amplexicaudatus*, *Macroglossus spelæus*, *Rhinolophus pusillus*, *Phyllorhina larvata* and *fulva* (see also J. A. S. B. 1872, p. 220), *Taphozous longimanus*, *Nycticejus luteus*, and *Vesperugo imbricatus*.

On Bats of *New Zealand*, F. W. Hutton & Knox, Trans. N. Z. Inst. iv. 1872, pp. 184–188.

Megaderma. Synopsis of the four known species by Peters, Berl. Monatsb. 1872, pp. 192–196; one is new, *M. cor*, from Abyssinia.

Rhinolophus larvatus indicated as a new species from Moupin, by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 91; described, Rech. Mammif. p. 248, pl. 37 *a*. fig. 1, pl. 37 *c*. fig. 1.

Phyllorhina micropus, sp. n., Hutton, P. Z. S. 1872, p. 703, N.W. Himalayas; or Peters, Berl. MB. 1872, p. 256.

Triænops persicus. Skeleton described and figured by Dobson, J. A. S. B. 1872, pp. 136–142, pl. 6. He adds an arrangement of the *Rhinolophidæ* from osteological characters.

Mormopes. Prof. Peters gives a synopsis of the bats belonging to this group, viz. 2 spp. of *Mormops*, 4 spp. of *Chilonycteris*, and 1 sp. of *Pteronotus*. Berl. MB. 1872, pp. 358–361.

Taphozous. G. E. Dobson gives a synopsis of the species of this genus, P. A. S. B. 1872, pp. 151–154, and describes *T. theobaldi*, sp. n., from Tennasserim, p. 152.—*T. kachhensis*, sp. n., Dobson, J. A. S. B. 1872, p. 221, Cutch.

Dysopes cestonii (var. *nigro-griseus*) described from a specimen obtained in Switzerland by G. Schneider, Nouv. Mém. Soc. Helvet. xxiv. 1871, pp. 9, with a plate.

Harpyiocephalus huttonii, sp. n., Peters, P. Z. S. 1872, p. 711, N.W. Himalayas; or Berl. MB. 1872, p. 257.

Vesperugo micropus, sp. n., Hutton, P. Z. S. 1872, p. 708, N.W. Himalayas; or Peters, Berl. MB. 1872, p. 259.

Vesperus (*Marsipolæmus*) *albigularis*, subg. et sp. n., Peters, *l. c.* p. 260, Mexico.

Vesperus propinquus, sp. n., from Guatemala, and *Vesperus tenuipinnis*, sp. n., from Guinea, Peters, *l. c.* pp. 262, 263.

Vespertilio moupinensis indicated as a new species from Moupin, by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 91; described Rech. Mammif. p. 253, pl. 37 *a*. fig. 2, pl. 37 *c*. fig. 4.

Vespertilio calcaratus, Pr. Max., described by Peters, who retains Gray's generic name, *Centromycteris*, for it. Berl. MB. 1872, pp. 699–703.

Vespertilio pachypus, Temminck, is the type of a new genus, *Tylonycteris*, Peters, *l. c.* p. 703, to which belongs also *T. meyeri*, sp. n., from Luzon, p. 705.

Pipistrellus leucotis, sp. n., Dobson, J. A. S. B. 1872, p. 222, Kachh.

Murina grisea, sp. n., Hutton, P. Z. S. 1872, p. 712, N.W. Himalayas; or Peters, Berl. MB. 1872, p. 258.

Murina aurata and *M. leucogaster* indicated as new species from Moupin, by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 91; described, Rech. Mammif. p. 250, pl. 37 *b*. fig. 1, and p. 252, pl. 37 *b*. fig. 2, pl. 37 *c*. fig. 3.

INSECTIVORA.

Erinaceus. Dr. Stoliczka gives a general review of the Indian Hedgehogs and describes as new *Erinaceus* (*Hemiechinus*) *pictus* from Cutch, J. A. S. B. 1872, p. 223, and *E.* (*H.*) *albulus* from Yarkand, p. 226.

Geogale is described as a new genus of the group *Centetinæ*, and connecting the Tenrecs with *Potamogale*, by A. Milne-Edwards, Ann. Sc. Nat. 1872, xv. p. 5.—*Geogale aurita*, sp. n., from Madagascar.

Soricidæ. The genera and subgenera arranged and tabulated. *Id.* Rech. Mammif. pp. 255–259.

Crocidura attenuata indicated as a new species from Western China. *Id.* Nouv. Arch. Mus. vii. Bull. p. 92; described, Rech. Mammif. p. 263, pl. 28 *b*. fig. 1, pl. 39 *a*. fig. 2.

Sorex cylindricauda and *S. quadraticauda* indicated as new species from West China. *Id. l. c.* 1°; described, *l. c.* 2°, pp. 260 & 261, pls. 38 *a*. fig. 3, 38 *b*.

Anurosorex squamipes described. *Id.* Rech. Mammif. p. 264, pl. 38. fig. 1, pl. 38 *a*. fig. 1.

Nectogale elegans described. *Id. l. c.* p. 266, pl. 39, pl. 39 *a*. fig. 1.

Uropsilus (*soricipes*) indicated as a new genus, intermediate between *Urotrichus* and *Sorex*, from Moupin. *Id.* Nouv. Arch. Mus. vii. Bull. p. 92; described, Rech. Mammif. p. 272, pls. 40, 40 *a*. fig. 1.

Scaptonyx indicated as a new genus, intermediate between *Talpa* and *Urotrichus*, from Western China. *Id.* Nouv. Arch. Mus. *l. c.*; described with the type, *S. fusicaudatus*, Rech. Mammif. p. 278, pls. 38 *b*. fig. 4, 40 *b*. fig. 2.

Talpa longirostris described. *Id. l. c.* p. 281, pls. 38. fig. 2, 17 *a*. fig. 2. A synopsis of the known species of *Talpa* is added.

Talpa europæa. "Die Schnautze des Maulwurfs als Tastwerkzeug" [*suprà*, p. 2].

CARNIVORA.

Felis. Philippi describes and figures *F. guinna* (Mol.) and the skulls of *F. colocolo* and *F. pajeros.* Wiegm. Arch. 1873, pp. 8–15, pls. 2 & 3.—Giebel makes some remarks on the skulls of *F. concolor*, *F. eyra*, and *F. yaguarundi.* Zeitschr. ges. Ntrw. 1872, vi. p. 431.

Felis pardinoides (Gray)=*Felis geoffroyi* (D'Orb.), according to Elliot, P. Z. S. 1872, p. 203.

Felis. M. A. Milne-Edwards continues his account of the Chinese species in Rech. Mammif. :—*F. irbis* (distinct from *F. tulliana*), p. 213, *F. chinensis*, p. 216, pl. 31 *a*. fig. 2, *F. microtis*, sp. n., p. 221, pls. 31 *a*, 31 *b*. fig. 1, *F. tristis*, sp. n., p. 223, pl. 31 *d*, and *F. manuz*, p. 225.

Felis scripta is indicated as a new species from Moupin. *Id.* Nouv. Arch. Mus. vii. Bull. p. 92.

Canis. Besides the common wolf, Prof. Jeitteles divides the wild dogs into two groups :—*a*. The jackal of the Mediterranean fauna. *b*. The prairie-wolf of North America (*Canis lupaster*), the Pyrenean wolf, the prairie-wolves of Eastern Europe, the dingo, F. Cuvier's *Canis anthus*, ♂, from the Senegal, and perhaps the wolf of Japan, are varieties of one and the same form, which may be termed *Canis lycoides.* Mittheil. anthrop. Ges. Wien, 1872.

Canis familiaris. A case of a bitch producing a litter of ten female pups at a birth, and another of a litter of sixteen, only one of which was of the male sex, are recorded in the Zoologist, 1872, pp. 2290, 3016.

Dr. Hensel relates his experiences with the domestic dog in Southern Brazil. Zool. Gart. 1872, pp. 1-7, 33–39, 78.

Canis jubatus and *C. azaræ.* Notes by Dr. Hensel, *l. c.* pp. 76, 77.

Cuon [*Cyon*]. Dr. Murie regards the Indian wild dogs, which have been specifically separated, as variations of one and the same form, for which the name *Canis primævus* may be retained. He describes the external and internal characters of the Dukkun variety. P. Z. S. 1872, pp. 715–721, with woodcuts.

Canis mesomelas. A case of abnormal dentition noticed by Dönitz. SB. ntrf. Freund. Berl. 1872, p. 54.

Canis vulpes. On a whitish variety, Krauss, Württ. ntrw. Jahresh. 1872, pp. 39–45.

Nandinia binotata. Note on the anatomy, by W. H. Flower, P. Z. S. 1872, pp. 682–683.

Herpestes griseus described by Stoliczka, J. A. S. B. 1872, p. 227.

Fossa daubentoni. Animal and skull described and figured by Gray, A. & M. N. H. 1872, x. p. 206, and P. Z. S. 1872, pp. 869–872, pl. 74.

Putorius moupinensis, *P. astutus*, and *P. davidianus* indicated as new species from Western China, by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 92.

Galera barbara. Note on varieties by Gray, A. & M. N. H. 1872, x. p. 405.

PINNIPEDIA.

A short account, with figures of the skulls, of "The Seals

that permanently reside in or occasionally visit the British Islands" is given by Dr. Gray, Zoologist, 1872, pp. 3333–38.

Arctocephalus. Dr. Gray describes and figures the skulls of *A. nigrescens* from the Falkland Islands, *A. cinereus* from New Zealand, and *Gypsophoca tropicalis* from Auckland Island, referring at length to the literature on these and allied species. P. Z. S. 1872, pp. 653–662.

Arctocephalus. Notes on the Fur-seal of New Zealand (*A. cinereus*?), by Hector & Webb, Trans. N. Z. Inst. iv. 1872, pp. 196–202, pl. 12 (skulls).—The skull regarded by Dr. Hector as a young *Arctocephalus cinereus* is referred to *Gypsophoca* by Gray, *l. c.* p. 743.

Eumetopias stelleri. Adolescent skull from Japan, and fœtal skull from California, described and figured by Gray, *l. c.* pp. 737–743, figs. 1–5.

Arctocephalus hookeri is very distinct from, although resembling the young of, *Otaria jubata.* Burmeister, Anal. Mus. Buenos Air. 1870, translated in A. & M. N. H. 1872, ix. pp. 89–91.

Otaria. On the habits of the Eared Seals of the Falkland Islands, H. Pain, P. Z. S. 1872, pp. 681 & 682.

Halichœrus gryphus on the Welsh coast. Gray, A. & M. N. H. 1872, ix. p. 322.

RODENTIA.

Dr. v. Martens has published an article on the names of Rodents in various languages. Zool. Gart. 1872, pp. 40–49. [See Zool. Rec. vi. p. 13, vii. p. 9, viii. p. 13.]

Sciurus pernyi described. A. Milne-Edwards, Rech. Mammif. p. 302.

Macroxus medellinensis, sp. n., allied to *M. tephrogaster*, Gray, A. & M. N. H. 1872, x. p. 408, New Granada.

Pteromys magnificus (Hodgs.) figured, P. Z. S. 1872, pl. 50.

Pteromys alborufus described. A. Milne-Edwards, Rech. Mammif. p. 298, pls. 45, 15*a*. fig. 1.

Arctomys robustus is indicated as a new species from Moupin. *Id.* Nouv. Arch. Mus. vii. Bull. p. 92.

Castor fiber. "On the construction of a Beaver-dam in Digby County, N. Sc.," by J. B. Gilpin, Proc. & Trans. N. Scot. Inst. N. Sc. 1872, iii. pp. 152–155.—"Observations on the Beaver of Orleans County," by J. Parker, Arch. Tr. Orl. Co. Soc. i. pp. 97–102.

Jaculus hudsonius, its hibernation. S. Tenney, Am. Nat. 1872, pp. 330–332.

Mus. Dr. Schöbl has recognized the external ear of mice as an organ of touch. Arch. mikr. Anat. vii. pp. 260–268, Taf. 21–24.

Mus decumanus. F. von Fischer calculates that a single pair might have, after 10 years, a progeny of 48,319,698,843,030,344,720 individuals. Zool. Gart. 1872, pp. 125 & 126.

Mus rattus found in New Zealand. Hutton, Trans. N. Z. Inst. iv. 1872, p. 183.

Mus flavipectus, M. griseipectus, M. ouang-thomæ, and *M. confucianus* indicated as new species from Western China by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 93; described, Rech. Mammif. pp. 286 *et seqq.* pls. 40–42.

Two other new species from the same country are *M. chevrieri*, p. 288, pl. 40. fig. 2, and *M. pygmæus*, p. 291, pl. 43. fig. 1.

Mus brevicaudatus, sp. n., Philippi, Zeitschr. ges. Ntrw. 1872, vi. p. 446, Valdivia.

Oxymycterus niger, sp. n., Philippi, *l. c.* p. 445, Chile.

Arvicola melanogaster indicated as a new species from Moupin by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 93; described, Rech. Mammif. p. 284, pls. 44, 46 *a*. fig. 1.

Rhizomys vestitus is indicated as a new species from Moupin. *Id. l. c.* 1°. p. 92; described, *l. c.* 2°. p. 292, pl. 46.

Sphingurus villosus. Notes by Dr. Hensel, Zool. Gart. 1872, p. 81.

Cavia cobaya. On its origin and natural history, Kolazy, Verh. z.-b. Ges. Wien, 1872, pp. 225–230.

Cœlogenys paca. Dr. Hensel has found that a place at the inner margin of the fore foot of the Paca and Aguti, corresponding to the part with which Rodents are in the habit of cleaning head and face, is covered with very short and fine hairs, and that this peculiarity is visible already in the fœtus. He regards this as an instance of an originally acquired peculiarity having become hereditary. Zool. Gart. 1872, p. 85.

Dasyprocta aguti. See *Cœlogenys paca*.

Dactylomys amblyonyx has one young only at a birth. Hensel, Zool. Gart. 1872, p. 80.

Ctenomys maulinus, sp. n., Philippi, Zeitsch. ges. Ntrw. 1872, vi. p. 442, Province Maule, Chile.

Lagostomus trichodactylus. "On the habits of the Vizcacha," by W. H. Hudson, P. Z. S. 1872, pp. 822–833.

Lagomys roylii is the Sikkim species, according to Blanford, who examines in detail the question of its nomenclature. J. A. S. B. 1872, p. 35.

Lagomus thibetanus is indicated as a new species from Moupin by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 93.

Lepus. A treatise on the hybrids between Hare and Rabbit, by A. Sanson, Ann. Sc. Nat. 1872, xv. pp. 26, pl. 6 (skulls).

Lepus americanus. A detailed account by Gilpin, Proc. & Trans. N. Scot. Inst. Nat. Sc. 1872, iii. pp. 46–55.

EDENTATA.

BURMEISTER, A. Osteologische Notizen zur Kunde der Panzerthiere Südamerika's. 2. Der Halstheil der Wirbelsäule. 3. Die verschiedenen Typen der Vorderfüsse. Arch. Anat. Phys. 1871 (published May 1872), pp. 694–715, Taf. 18.

This is the continuation of the paper noticed in Zool. Rec. viii. p. 14, where it is erroneously stated to have been published in 'Zeitschr. wiss. Zool.'

Manis. L. J. Fitzinger has compiled a synopsis of the species. SB. Ak. Wien, 1872, lxv. pp. 75.

Dasypus. L. J. Fitzinger has compiled a synopsis of the species. SB. Ak. Wien, 1871, lxiv. pp. 209–276, 329–390.

Dasypus. On South-Brazilian species, Hensel, Zool. Gart. 1872, pp. 151–154.

Scleroplewra, g. n., A. Milne-Edwards, Nouv. Arch. Mus. vii. 1871 (? 1872), p. 176. Distinguished from *Dasypus* in having the middle of the back and head nearly destitute of scutes. *S. bruneti*, sp. n., pl. 12, from the Province Ceara.

Myrmecophaga jubata. "Sur la composition vertébrale du Tamanoir," by G. Pouchet. Journ. de l'Anat. Phys. 1872, pp. 539–549.

Myrmecophaga tetradactyla. On its habits, Hensel, *l. c.* p. 177, and Zietz, *ibid.* pp. 301–304.—On the structure of the placenta, A. Milne-Edwards, Ann. Sc. Nat. xv. 1872, pp. 4, pl. 5.

Cholopus hoffmanni and *didactylus* figured, P. Z. S. 1872, pl. 72.

PACHYDERMATA.

Elephas primigenius. F. Schmidt's report on the Mammoth discovered on the lower Jenissei has been noticed above (pp. 4, 5).

Elephas indicus. "Contributions to the Anatomy of the Indian Elephant. Part II. Urinary and generative organs," by M. Watson, in Journ. Anat. & Physiol. 1872, pp. 60–74, pl. 4. [See Zool. Rec. viii. p. 15.]

Elephas africanus. On the kidneys, W. Dönitz, in Arch. Anat. Phys. 1872, pp. 85–89, Taf. 2 B.

Hippopotamus amphibius. "Additional notes on the breeding of the Hippopotamus in the Society's Gardens," by A. D. Bartlett, P. Z. S. 1872, pp. 819–821.—"Note on the Placenta," by A. H. Garrod, *ibid.* pp. 821–822.—On the visceral anatomy of a newly-born individual, J. W. Clark, P. Z. S. 1872, pp. 185–195, with woodcuts.

Sus moupinensis is indicated as a new species from Moupin, by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 93.

Rhinoceros sumatrensis. Notes on an example captured at Chittagong, and sent to the Zoological Gardens, Regent's Park, by Anderson, P. Z. S. 1872, pp. 129–132.—Mr. Sclater proposes the name of *R. lasiotis* for it, and figures it, *ibid.* p. 493, pl. 23. [This figure is much too dark, the animal being of a decidedly greyish colour, with the *hairs* brown.]—Dr. Gray considers this to be the true *R. sumatranus*; and a second example received by the Zoological Society from Malacca he has recognized as his *R. crossii*, A. & M. N. H. 1872, x. pp. 207–209. The latter example is *R. sumatrensis*, Sclater, *ibid.* p. 298.—Mr. Blyth, in a paper "On the species of Asiatic Two-horned Rhinoceros," *ibid.* pp. 399–405, gives it as his opinion that Sclater's *R. lasiotis* is very probably the same as *R. crossi*, and that the Malacca animal is the veritable *R. sumatrensis*, but not the animal figured under that name by Temminck & Schlegel. Mr. Sclater gives woodcuts of the heads of the two species, P. Z. S. 1872, pp. 792 & 793, and figures what he considers to be *R. sumatrensis*, pl. 67.

On *Rhinoceros sondaicus* and *R. indicus*, Blyth, Zool. 1872, pp. 3104–3108.

Tapirus. Dr. Gray describes some specimens of "Hairy Tapir" from Ecuador as *T. leucogenys*, sp. n., P. Z. S. 1872, p. 488, pl. 21, and points out its differences from *T. roulini*. He describes and figures (on pl. 22) the young of *T. ænigmaticus*, sp. n.?, p. 490, *T. ecuadorensis*, sp. n., and *T. terrestris*, p. 492, and *T. peruvianus*, sp. n., from the Upper Amazons, p. 624, pl. 54.

Tapirus bairdi, juv., and *T. terrestris* figured, P. Z. S. 1872, pls. 51 & 52.

Equus caballus. Another case of polydactylism [see Zool. Rec. viii. p. 16] is mentioned by Prof. Leidy, Proc. Ac. Nat. Sc. Philad. 1871, p. 112.

RUMINANTIA.

Gray, J. E. Catalogue of Ruminant Mammalia (Pecora, Linnæus) in the British Museum. Lond.: 1872. 8vo, pp. 102, with 4 plates.

This catalogue contains references to all the species known, especially to the specimens in the British Museum. All the genera, and the majority of the species, are characterized by short diagnoses. The plates represent skulls of species which will be mentioned below.

Capra picta, ♀, figured by Sclater, P. Z. S. 1872, p. 689, pl. 58.

Antilope. Dr. Gray figures the skulls of the following Antelopes in Catal. Rumin. Mamm.:—*Nesotragus livingstonianus*, fig. 1; *Neotragus saltianus*, fig. 2; *Adenota lechee*, fem., fig. 4; *Pelia capreola*, fig. 5; *Damalis pygarga*, fig. 6; *Grimmia madoqua*, fig. 7; and *Urotragus caudatus*, fig. 8.

Oryx beatrix comes from Arabia. Sclater, P. Z. S. 1872, p. 603.

Gazella granti, sp. n., Sir V. Brooke, P. Z. S. 1872, p. 601, pl. 41, Ugogo.

Antilope hodgsoni. Its head figured in R. Shaw's 'Visits to High Tartary, Yarkand, and Kashgar.' London: 1871, 8vo, p. 169.

Nemorhedus griseus is indicated as a new species from Western China by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 93.

Nanotragus. Sir V. Brooke regards *Nanotragus*, *Calotragus*, *Scopophorus*, *Nesotragus*, and *Oreotragus* as divisions of the same generic group, which he characterizes and compares with *Cephalophus*. He has worked out the literary history and synonymy of *Nanotragus pygmæus*, which is figured on pl. 53. P. Z. S. 1872, pp. 637–643, with woodcut of skull.

Nanotragus nigricaudatus, sp. n., Brooke, *l. c.* p. 874, pl. 75, Gambia.

Camelopardalis. The list of Giraffes which have lived in the Gardens of the Zoological Society of London is carried down to the present date by Sclater, P. Z. S. 1872, p. 184.

Dr. Murie has examined the horns, viscera, and muscles of two Giraffes which perished by fire in those Gardens, A. & M. N. H. 1872, ix. pp. 177–195, pls. 7, 8. In the conclusions at which he has arrived he agrees with those who look upon the three bony protuberances on the skull as extraneous ossific centres adherent primarily in the manner of epiphyses. He asks whether, after all, the different horned types in Ruminants may be but textural shades of kind of but one organic homologue? The discrepancies in the statements of authors as regards the length of the alimentary canal are explicable on the grounds of age and sex; and the presence of a gall-bladder is of such unfrequent occurrence, that it may be classed as an anomaly. The author has studied also more particularly the muscles of the neck.

Cervus alces. A detailed description of the Moose of Nova Scotia by Gilpin, Proc. & Trans. N. Scot. Inst. N. Sc. 1872, iii. pp. 109–121.

Cervus tarandus. A detailed description of the Cariboo of Nova Scotia by Gilpin, *l. c.* pp. 55–61.

Cervus dama. According to Jeitteles the fallow deer was distributed all over Europe during the diluvial period and in still later times. Mittheil. anthropol. Ges. Wien, 1872.

Cervus axis. A case of abnormal dentition noticed by Dönitz. SB. ntrf. Freund. Berl. 1872, p. 54.

Cervus savannarum, ♂, figured by Sclater, P. Z. S. 1872, p. 690, pl. 59.

Cervus alfredi is from the Philippine Islands. Sclater, *l. c.* p. 24.

Cervus superciliaris described by Schmidt, Zool. Gart. 1872, p. 74.

Cervus capreolus. On monstrous horns, Schröckinger-Neudenberg, Verh. z.-b. Ges. Wien, 1872, p. 223.

Capreolus pygargus. Note by Dr. Gray, A. & M. N. H. 1872, x. p. 407.

Cervus. Dr. Gray now believes he has received the true Guémul of Molina (*Huamela leucotis*); the Deer formerly described under this name [see Zool. Record, vi. p. 22, vii. p. 14] is a distinct animal, which may be called now *Xenelaphus anomalocera.* Gray, A. & M. N. H. 1872, x. pp. 445, 446.

Elaphodus cephalophus is indicated as a new genus, intermediate between *Cervus* and the Muntjacs, from Moupin, by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 93.

Cervus muntjac. Notes on a living example, Schmidt, Zool. Gart. 1872, pp. 22–25.

Cervulus reevesi. Skull of male figured by Gray, Cat. Rum. Mamm. fig. 3.

Cervulus sclateri is described as a new species from Ningpo by Swinhoe, P. Z. S. 1872, p. 814.

Cervulus lacrymans is indicated as a new species from Moupin by A. Milne-Edwards, Nouv. Arch. Mus. vii. Bull. p. 93.

Hydropotes. Sir V. Brooke has examined and figured the skull, P. Z. S. 1872, pp. 522–525; he is inclined to leave it in a group of *Cervidæ* by itself. —Note referring to its natural history by Cornely, Bull. Soc. Acclim. 1872, p. 791.—Notes by Swinhoe, P. Z. S. 1872, p. 815.

Hyæmoschus. Its myology described by Chatin. Ann. Sc. Nat. xv. 1872, pp. 32, pls. 7–9.

SIRENIA.

Rhytina borealis. Notes relative to Dr. Alex. Brandt's paper on the skin of *Rhytina* [see Zool. Record, viii. p. 18] by Dr. Murie, A. & M. N. H. 1872, ix. pp. 306–313, pl. 19.

Manatus americanus. A very elaborate monograph "On the Form and Structure of the Manatee" by Dr. Murie has been published in Trans. Zool. Soc. viii. 1872, pp. 127–202, pls. 17–26.—Dr. F. Krauss describes the pelvic bones, Arch. Anat. Phys. 1872, pp. 257–292, Taf. 9 and 10.

CETACEA.

Prof. J. F. Brandt has published a preliminary notice of a memoir (on which he is engaged) on a new classification of the Balænoidea, including the extinct genera. He does not adopt the elaborate subdivisions proposed by recent authors, but admits only the following families and genera (Bull. Ac. Sc. St. Pétersb. xvii. 1872, pp. 113–124) :—

Fam. 1. Balænidæ: gen. *Balæna.*

Fam. 2. Balænopteridæ.

a. Subfam. *Balænopterinæ*: gen. *Kyphobalæna* and *Pterobalæna*.
b. Subfam. *Cetotheriopsinæ*: gen. *Cetotheriopsis*.
c. Subfam. *Cetotheriinæ*: gen. *Cetotherium*, *Plesiocetus*, and probably *Pachyacanthus*.

Eschrichtius robustus. Description of the remains of a skeleton of this subfossil Whale, found in Cornwall under similar circumstances as the type, by Prof. Flower, A. & M. N. H. 1872, ix. pp. 440–442.

Balænoptera. "On the cervical vertebræ and their articulations in Fin-Whales," by J. Struthers, in Journ. Anat. & Phys. 1872, xi. pp. 1–55, pls. 1 & 2.

Balænoptera. Prof. Burmeister distinguishes now three species from the Argentine coasts:—*B. patachonica*, *B. bonaerensis*, and *B. intermedia*, sp. n. He describes the skeleton of the last, comparing it with the two first. Bol. Mus. Buen. Air. 1872, pp. xi–xiv; translated in A. & M. N. H. 1872, x. pp. 413–418.

Balænoptera rostrata figured by Gervais in Nouv. Arch. Mus. Paris, vii. pl. 3*.

Balænoptera musculus. Dr. T. Dwight has given a detailed description of the skeleton in the possession of the Boston Natural-History Society, adding remarks on the classification of Fin-Whales. Mem. Bost. Soc. Nat. Hist. 1872, ii. pp. 203–230, with 11 woodcuts and 2 plates.

Physeter. P. Fischer has compiled a list of the Cachalots known to have been stranded on the coasts of France. Journ. Zool. 1872, pp. 236–242.—A note on the same subject by Gervais, *ibid.* p. 537.

Physeter macrocephalus. "Additional notes on the occurrence of the Sperm-Whale in the Scottish Seas," by Turner, Proc. R. Soc. Edinb. 1871–72, pp. 632–644, with woodcuts.

Monodon monoceros. Prof. Turner has found that the Narwhal, at a very early stage of development, has four teeth in the upper jaw. Journ. Anat. & Phys. vii. pp. 75–79.

Delphinus delphis. A fœtus, 0·10 mètre long, noticed and figured by P. & H. Gervais, Journ. Zool. 1872, pp. 323 & 324, pl. 17.

Delphinus desmaresti (Risso). Note by Dr. Gray, A. & M. N. H. 1872, x. p. 468.

Lagenorhynchus clanculus. Notes on its external characters and skull, by Dr. Hector, A. & M. N. H. 1872, ix. pp. 436–438, with woodcut.

Pseudorca. *Globiocephalus grayi* (Burm.) is a distinct species of this genus. Burmeister, A. & M. N. H. 1872, x. pp. 51–54.—Prof. Reinhardt shows that, hitherto, no characters have been pointed out by which this Dolphin could be distinguished from *P. crassidens*. Vid. Medd. 1872, pp. 95–108.

Orca rectipinna (Cope). A Cetacean with a similar dorsal fin has been seen by Holdsworth on the coast of Ceylon. P. Z. S. 1872, pp. 583–586, with woodcut.

Globiocephalus macrorhynchus. Notes on a fœtus by P. Fischer. Journ. Zool. 1872, pp. 273–276.

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* At the time of the preparation of our last Record we were in possession of only a portion of M. Gervais's memoir (Zool. Rec. viii. p. 19). However, we have nothing to add to the notice then given, except that the memoir is illustrated by seven plates (3–9).

Globiocephalus edwardsi not specifically distinct from *G. melas*. Skeleton noticed by Fischer, *l. c.* pp. 276–278.

Grampus griseus=rissoanus. A detailed description of the examples captured on the British coast is given by Prof. Flower in Trans. Zool. Soc. viii. 1872, pp. 1–21. He refers this Dolphin to the subgenus *Grampus*, which he characterizes in comparison with *Globiocephalus*. Pl. 1 represents the animal, pl. 2 the skeleton.

Ziphius. In a paper published in the Trans. Zool. Soc. viii. 1872, pp. 203–234, Prof. Flower has collected all available information with regard to these Cetaceans. He points out that there exist well-marked structural characteristics by which certain small groups of species are differentiated from one another, viz. *Ziphius, Hyperoodon, Mesoplodon*, and *Berardius*. The skeleton of *B. arnouxi* is fully described and figured on pls. 27–29. —As regards *Mesoplodon*, Prof. Turner comes to the same conclusion as Prof. Flower. Trans. R. Soc. Edinb. xxvi. 1872, p. 777.

Ziphius cavirostris. Prof. Turner describes and figures the skull of an example from Shetland. Trans. R. Soc. Edinb. xxvi. 1872, pp. 759–770, pls. 29 & 30 (part.).

Mesoplodon sowerbii. Prof. Turner describes and figures a skull in his museum, *l. c.* pp. 771–780, pls. 29 & 30 (part.).

MARSUPIALIA.

Owen, R. On the Fossil Mammals of Australia.—Part V. Genus *Nototherium*. Phil. Trans. 1872, pp. 41–82.—Part VI. Genus *Phascolomys*. *Ibid.* pp. 173–196, pls. 17–23. [See Zool. Rec. viii. p. 21.]

Didelphys virginiana. Notes on its variation, by Dr. Elliott Coues, Proc. Ac. Nat. Sc. Philad. 1871, pp. 15–18.

Sarcophilus ursinus. "Further observations on the Myology," by A. Macalister, A. & M. N. H. 1872, x. pp. 17–20.

Phascolarctos cinereus. "The Muscular Anatomy of the Koala," by A. Macalister, *l. c.* pp. 127–134. This animal presents, in its muscular system, a greater number of structural divergences from the general placental type than, perhaps, any other Didelphian.

Phascolomys. The craniological characters of the living species compared with those of the extinct in Prof. Owen's memoir noticed above.

Phascolomys latifrons. Notes by A. Macalister, with figure of skull, P. Z. S. 1872, pp. 497–502.

Phascolomys assimilis noticed as a new species by Krefft, *l. c.* p. 796.

AVES

BY

R. Bowdler Sharpe, F.L.S., F.Z.S., &c.

The past year has been characterized by the increased attention given to the anatomy of Birds. The remarkable attempt at a natural classification of the class by Prof. Sundevall, and the somewhat pretentious 'Thesaurus' of Prof. Giebel, portions of which have appeared, will always render the ornithological literature of 1872 memorable, to say nothing of the commencement in India of a new journal, 'Stray Feathers,' solely devoted to the advancement of this branch of science.

BIBLIOGRAPHY AND CRITICISM.

Hartlaub, G. Bericht über die Leistungen in der Naturgeschichte der Vögel während des Jahres 1871. Arch. f. Nat. xxxviii., ii. pp. 42.

With this twenty-fifth annual report on the progress of ornithology during the previous year, the author takes leave of the duty which he has so efficiently discharged for a quarter of a century.

Salvin, O., & Sclater, P. L. Index to the Ornithological Literature of 1871. Ibis, 1872, pp. 413–468.

In continuation of the paper noticed last year (Zool. Rec. viii. p. 28). Well executed, and of some practical utility, but requiring beforehand a knowledge either of the name of any author to whose work reference is desired, or of that of the genus under which any species is mentioned.

Giebel, C. G. Thesaurus Ornithologiæ. Repertorium der gesammten ornithologischen Literatur und Nomenclator sämmtlicher Gattungen und Arten der Vögel nebst Synonymen und geographischer Verbreitung. Leipzig: 1872. 8vo. Halbband i. & ii., pp. i–viii, 1–868.

The portion of the work at present published is divided into two heads, the 'Repertorium Ornithologicum' and the 'Nomenclator Ornithologicus.' The first refers exclusively to literature, the papers being ranged in alphabetical order under the following classified heads:—'Ornithologia generalis.—Systema.—Nomenclatura' (pp. 1–9), 'Opera periodica' (pp. 9, 10), 'Opera illus-

trata et collectiva' (pp. 10–13), 'Monographiæ.—Familiæ.—Genera.—Species (pp. 13–81), 'Pterylographia' (pp. 81–85), 'Anatomia. Physiologia' (pp. 85–105), 'Embryologia' (pp. 105–108), 'Oologia. Nidologia' (pp. 108–116), 'Propagatio' (pp. 116–122), 'Biologia' (pp. 122–145), 'Migratio' (pp. 146–155), 'Distributio geographica,' with various subdivisions (pp. 155–212), 'Aves monstrosæ, abnormes, hybridæ' (pp. 212–217), 'Palæornithologia' (pp. 217–223), 'Aves domesticæ et captivæ' (pp. 223–238), 'Ornithologia agraria et venatoria' (pp. 238–243), 'Ornithologia vulgaris' (pp. 243–247), 'Collectiones' (pp. 248–250), 'Taxidermia' (pp. 250–252). The second part, 'Nomenclator Ornithologicus,' proceeds as far as the letter C, and serves sufficiently as a specimen of what the whole work will be like. So many and just criticisms have been passed upon this much talked-of book, that it is not proposed here to do more than to confirm the opinions of reviewers to the full extent. To suppose that a work like the present could be devoid of all utility would be unfair; but the arrangement of the subjects under the various headings are so arbitrary, confusing, and erroneous, that it will always be difficult to obtain from it any information required, and when obtained it cannot be trusted. As regards the second part of the work, ornithologists will decline to recognize in the author an authority who is to act as censor of the science, in the face of the evident proofs of incompetency flagrant on every page. Had he but been content to take Gray's 'Hand-list,' and supply the references there unfortunately wanting, giving his own opinions freely but separately, Prof. Giebel would have earned the lasting gratitude of ornithologists. For such a task, however, he is manifestly unfit. [*Cf.* J. f. O. 1872, pp. 225–230; Literarisches Centralblatt, 1872, pp. 215–217, 318; Z. ges. Naturw. Feb. 1872; Ibis, 1872, pp. 191–193; Am. Nat. vi. pp. 549–551.]

THE GENERAL SUBJECT.

Brehm, A. E. Bird-Life. Translated from the German by H. M. Labouchere and W. Jesse. London: 1872. 8vo. Parts iv.–vi.

A continuation of the work before noticed (Zool. Rec. viii. p. 25).

Cope, E. D. Synopsis of the extinct Batrachia, Reptilia, and Aves of North America. Tr. Am. Phil. Soc. xiv. pp. 1–250, pls. i.–xiv. [*Phasianidæ, Pelecanidæ.*]

Hutton, F. W. On the Flight of Birds. Ibis, 1872, pp. 139–143.

The author, returning to the subject he has before discussed (Zool. Rec. vi. p. 28), agrees in all but one point with M. Marey

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(*loc. cit.*), and criticizes the opinions of Dr. Pettigrew (Zool. Rec. v. p. 38).

HUTTON, F. W. On the flight of the Black-backed Gull. [See *Laridæ*.]

KIRBY, W. F. On the Geographical Distribution of the Diurnal Lepidoptera as compared with that of Birds. J. L. S. Zool. xi. pp. 431–439.

The author bases his remarks on the old estimate of 7500 species of Birds, though admitting that 11,000 have now been enumerated, while with regard to Butterflies he takes his own recent estimate of 7700 species; the results therefore are hardly satisfactory.

MARSH, O. C. Notice of some new fossil Mammals and Birds from the Tertiary formation of the West. Am. J. Sc. (3) ii. pp. 120–127. [*Falconidæ, Strigidæ, Phasianidæ.*]

——. Preliminary description of *Hesperornis regalis*, with notices of some other new species of Cretaceous Birds. *Op. cit.* iii. pp. 360–365. [*Scolopacidæ, Pelecanidæ, Colymbidæ.*]

——. Notice of some new Tertiary and Post-tertiary Birds. *Op. cit.* iv. pp. 256–262. [*Picariæ, Grallæ, Gruidæ, Alcidæ, Saururæ.*]

PREEN, C. Ausrottung der Singvögel. J. f. O. 1872, pp. 209–224, 275–286.

Discusses very ably the causes which in Germany affect the abundance of song-birds, showing that decrease in their numbers is the effect of physical causes and not of direct human agency, the consequences of which are scarcely appreciable.

SUNDEVALL, CARL J. Methodi Naturalis Avium disponendarum Tentamen. 8vo. Stockholm: 1872–73, pp. A–F, lxix, 187, 11*.†

Without expressing an opinion as to whether the author has found the natural system for which he has been searching, no doubt can exist as to the importance of this unpretending little tract. After a short Preface (pp. C–F) comes an Introduction (pp. i–xxxiv), in which many subjects highly interesting to the general naturalist are discussed, as will be seen from the headings of the chapters into which it is divided:—1. Remarks on the growth of the Ornithological System (pp. i–vii); 2. On the idea of Affinity as the ground of a Natural System (pp. viii–xv); 3. On the object of Systematic Exposition (pp. xv–xx); 4. Remarks on the Arrangement here admitted (pp. xx–xxiv); and 5. On Systematic Names (pp. xxiv–xxxiii). Both Preface and

† Properly only the former part (pp. i–xlviii, 1–72) of this work belongs to the literature of 1872; but, to obviate the need of recurring to it, the latter part is noticed here as well, though, owing to the author's ill health, not published till 1873. The latter part contains several corrections, the effects of which are incorporated in our abstract.

Introduction are accompanied by a French translation (pp. xxxv–lxix), which of course renders them far more accessible than if the original Swedish had alone been given. We need only remark of these disquisitions that Prof. Sundevall protests (p. d) against the bad but common practice of giving the name of a genus, followed by that of its author and date, without any indication of the work in which it was bestowed, and also (p. xvi) against "the common but altogether false belief that anatomical or internal characters are always better and surer than external characters." Then follows, in Latin, a 'Methodi Avium disponendarum Expositio,' which, with its *addenda*, is so masterly handled in a small space (pp. 1–158), that not only have we the characters of every group larger than a genus explicitly given, but even those of many genera are also indicated. The arrangement he follows is based on that he promulgated in 1835 (Sv. Ak. Handl. pp. 43–130), and still further in 1843 (*op. cit.* pp. 303–384), and is as follows :—

Agmen I. **PSILOPÆDES** sive **GYMNOPÆDES** (p. 158).

Ordo I. **Oscines.**

Series i. *LAMINIPLANTARES.*

Cohors 1. CICHLOMORPHÆ. Phalanx 1. *Ocreatæ* (7 fam.), 2. *Brevipennes* (12 fam.), 3. *Æquiparatæ* (10 fam.), 4. *Brachypodes* (8 fam.), 5. *Latirostres* (7 fam.), 6. *Novempennatæ* (6 fam.).

2. CONIROSTRES. Phalanx 1. *Decempennatæ* (3 fam.), 2. *Amplipalatales* (2 fam.), 3. *Arctipalatales* (6 fam.), 4. *Simplicirostres* (4 fam.).

Cohors 3. COLIOMORPHÆ. Phalanx 1. *Novempennatæ* (3 fam.), 2. *Humilinares* (4 fam.), 3. *Altinares* (4 fam.), 4. *Idiodactylæ* (5 fam.).

4. CERTHIOMORPHÆ (3 f.).

5. CINNYRIMORPHÆ (5 f.).

6. CHELIDONOMORPHÆ (1 f.).

Series ii. *SCUTELLIPLANTARES.*

Cohors 1. HOLASPIDEÆ (2 fam.).

2. ENDASPIDEÆ (3. fam.).

3. EXASPIDEÆ (3 fam.).

Cohors 4. PYCNASPIDEÆ (3 fam.).

5. TAXASPIDEÆ (5 fam.).

Ordo II. **Volucres.**

Series i. *ZYGODACTYLÆ.*

Cohors 1. PSITTACI (6 fam.).

2. PICI (6 fam.).

Cohors 3. COCCYGES (12 fam.).

Series ii. *ANISODACTYLI.*

Cohors 4. CŒNOMORPHÆ (4 fam.) (*cf.* p. 155).

5. AMPLIGULARES (4 fam.).

Cohors 6. MELLISUGÆ (*cf.* p. 155) (12 fam.).

7. SYNDACTYLÆ (4 fam.).

8. PERISTEROIDEÆ (3 f.).

Agmen II. **PTILOPÆDES** sive **DASYPÆDES** (p. 158).

Ordo III. **Accipitres.**

Cohors 1. Nycthareages (4 fam.).
2. Hemerohareages (8 f.).
3. Saprohareages (2 fam.).
4. Necrohareages (2 fam.).

Ordo IV. **Gallinæ.**

Cohors 1. Tetraonomorphæ (2 f.).
2. Phasianomorphæ (4 f.).
3. Macronyches (2 fam.).
4. Duodecimpennatæ (2 f.).
5. Struthioniformes (1 f.).
6. Subgrallatores (2 fam.).

Ordo V. **Grallatores.**

Series i. *Altinares.*

Cohors 1. Herodii (1 fam.).
2. Pelargi (4 fam.).

Series ii. *Humilinares.*

Cohors 3. Limicolæ (2 fam.).
4. Cursores (8 fam.).

Ordo VI. **Natatores.**

Cohors 1. Longipennes (3 fam.).
2. Pygopodes (3 fam.).
3. Totipalmatæ (1 fam.).
4. Tubinares (3 fam.).
5. Impennes (1 fam.).
6. Lamellirostres (2 f.).

Ordo VII. **Proceres.**

Cohors 1. Veri (2 fam.).
2. Subnobiles (1 fam.).

Ordo VIII. **Saururæ.**

In this arrangement the author finds it necessary to make 25 new genera, which will be mentioned under the families to which they belong, and 18 genera receive new names in place of those before used; while the names of 14 others are correctly modified and 13 old generic names are restored, the whole number recognized being 1229. A good Index is added; and the work is completed by an Appendix, pp. 1*–11*, containing an explanatory list of ornithographical terms.

PALÆARCTIC REGION.

Collett, R. Remarks on the Ornithology of Northern Norway. Forh. Selsk. Christ. 1872, pp. 1–123.

The results of the author's explorations during the summers of 1871 and 1872, in Namdalen, Nordland, and West Finmark, in continuation of those before noticed (Zool. Rec. viii. p. 31), and of considerable interest. The paper is in English, and is accompanied by a useful map.

Dresser, H. E. [See Sharpe, R. B.]

Cordeaux, J. Birds of the Humber District. London: 1872. Sm. 8vo, pp. xii, 231.

Treats of 276 species found within the limits of the district, which extends from Flamborough Head, on the Yorkshire coast, in the north, to Skegness, in Lincolnshire, in the south, and inland as far as the junction of the Ouse and Trent with the Humber. The information as regards migration is valuable.

Feilden, H. W. The Birds of the Færoe Islands. Zool. s. s. pp. 3210; also separately, pp. 47.

Adds considerably to our knowledge of Færoese birds, the author having received much help from Herr H. C. Müller, whose excellent paper on the subject (Vid. Medd. 1862, pp. 1–78) is well known. The number of species observed is raised to 138, of which one (*Sturnidæ*) is named as new in the separately printed copies.

Finsch, O. Ueber eine Vögelsammlung aus den Küstenländern der chinesisch-japanischen Meere. Verh. z.-b. Wien, xxii. pp. 253–272.

Notes on 57 species.

Fischer, J. von. Verzeichniss der Vögel des St.-Petersburgen Kreises. J. f. O. 1872, pp. 385–390.

This welcome addition to what is known of the ornithology of Russia records 147 species, some few doubtfully.

Fritsch, A. Die Vögel Böhmens. *Tom. cit.* pp. 366–384.

Concludes the paper before noticed (Zool. Rec. viii. p. 32), 297 species being altogether included. Tables of the resident and migratory birds are added.

Godman, F. Du Cane. Notes on the Resident and Migratory Birds of Madeira and the Canaries. Ibis, 1872, pp. 158–177, 209–224.

A valuable paper, embodying the results of previous observers, as well as the author's own experience, and noticing 85 species, of which one (*Columbidæ*) is new.

Gould, J. The Birds of Great Britain. Parts xx., xxi. London: 1872. Folio.

The customary parts of this work are of more than average excellence, containing several fine plates by Mr. Wolf.

Hanf, P. B. Ornithologische Beobachtungen. Verh. z.-b. Wien, xxii. pp. 399–404.

In continuation of last year's notes (Zool. Rec. viii. p. 32).

Harting, J. E. A Handbook of British Birds, showing the distribution of the resident and migratory species in the British Islands, with an index to the records of the rarer visitants. London: 1872. 8vo, pp. i–xxiv, 1–198.

This useful book, the object of which is fully explained by its

title, gives the British Ornis 261 resident and migrant species, and 135 rare visitants, in all 396.

Heuglin, M. T. von. Notes on the Birds of Novaja Zemlia and Waigats Island. Ibis, 1872, pp. 60–65.

——. Die Rosenthal'sche Expedition nach dem Nordpolarmeer. Ornithologie von Novaja Semlja und der Waigatsch-Inseln. J. f. O. 1872, pp. 113–128; Nachtrag, p. 464.

These include the birds observed by Herr Spörer and by Mr. Gillett (Zool. Rec. vii. p. 23), bringing the number of species known to inhabit those countries up to 43.

Homeyer, E. F. von. Bemerkungen über einige Vögel Norddeutschlands, mit besonderer Rücksicht auf die Vögel Pommerns. *Tom. cit.* pp. 332–340.

Some short but interesting notes.

Newton, Alfred. A History of British Birds. By the late William Yarrell. Fourth edition. Revised. 8vo. Parts iii. iv. London: 1872.

Carries the work into the *Sylviidæ*.

Norguet, — de. Études d'Ornithologie Européenne. Des Races Locales. Lille: 1868. 8vo, pp. 132. [Extract from Mém. Soc. Lille (3) vi.]

The author examines 27 "races," of which he declares 10 (*Gyps occidentalis, Aquila chrysaetus, A. clanga, Hierofalco islandicus, Accipiter major, Noctua persica, Hydrobata melanogaster, Cyanecula cærulecula, Larus niveus, Anser pallipes*) to be individual varieties, 10 (*Garrulus krynicki, Sturnus unicolor, Passer italiæ, P. hispaniolensis, Pyrrhula coccinea, Budytes rayi, B. cinereocephala, B. melanocephala, Motacilla yarrelli, Hirundo cahirica*) to be good species. Want of evidence at present makes him doubtful as to the remaining 7; but he thinks 4 (*Corvus leucophæus, Saxicola lugens, Pelidna torquata, Uria mandti*) are probably varieties, and 3 (*Cygnus immutabilis, Uria ringvia, Podiceps holbœlli*) are probably good species.

Rey, E. Synonymik der europäischen Brütvogel und Gäste. Systematisches Verzeichniss nebst Angaben über die geographische Verbreitung der Arten unter besonderer Berücksichtigung der Brutverhältnisse. Halle: 1872. 8vo, pp. xvi, 257.

Gives the principal synonymy and distribution of 616 species, with a very full index.

——. Zur Ornis von Portugal. J. f. O. 1872, pp. 140–155.

Treats of 111 species, adding much to what was before known of the subject (Zool. Rec. vii. p. 25).

Salvadori, T. Fauna d'Italia. Parte seconda. Uccelli. Milano: 1872. 8vo, fasc. 3–8, pp. 81–352.

This useful work (Zool. Rec. viii. p. 34) is here concluded. The distribution of the 414 species now known to have occurred in Italy is compendiously shown in tables, while the introduction contains a good bibliography.

Saunders, H. On a new species of Green Woodpecker [*Picidæ*] from Southern Europe. P. Z. S. 1872, p. 153.

Schmidt, M. F. Wissenschaftliche Resultate der zur Aufsuchung eines angekündigten Mammuthcadavers von der k. Akademie der Wissenschaften an den unteren Jenissei ausgesandten Expedition. Mém. Ac. Imp. Sci. St. Pétersb. xviii. pp. 1–168.

A list of the birds obtained is given (pp. 42–44). [*Cf. suprà*, pp. 4, 5.]

Sharpe, R. B., & Dresser, H. E. A History of the Birds of Europe, including all the species inhabiting the western Palæarctic Region. London: 1872. Parts x.–xv. 4to.

The birds figured are noticed under the heads of their respective families.

Taczanowski, L. Briefliche Mittheilungen des Capitains Przewalski aus Ost-Asien. J. f. O. 1872, pp. 137 & 138.

Notes on 19 species obtained on a journey from Kiachta to Peking, over the Gobi desert.

——. Bericht über die ornithologischen Untersuchungen des Dr. Dybowski in Ost-Sibirien. *Tom. cit.* pp. 340–366, 433–454.

The best and most connected account of this traveller's discoveries, with copious notes by him. One species is described as new (*Paridæ*).

Tschusi-Schmidhofen, Victor von. Ornithologische Mittheilungen aus Oesterreich (1871). *Tom. cit.* pp. 131–139.

Field-notes of local interest.

Yarrell, William. [See Newton, Alfred.]

ETHIOPIAN REGION.

Andersson, C. J. Notes on the Birds of Damara Land and the adjacent countries of South-west Africa. Arranged and edited by J. H. Gurney. 8vo. London: 1872, pp. xlviii. 394, pls. iv.

In publishing his unfortunate friend's notes, the editor has done great service, as this book, including an account of 428

species, fills the great gap formerly existing between the limits of Mr. Layard's work (Zool. Rec. iv. p. 60) and Dr. Hartlaub's 'Ornithologie West-Africa's.'

Bocage, J. V. Barboza du. Aves das possessões Portuguezas da Africa occidental. Sexta Lista. Jorn. Sc. Lisb. 1872.

A list of 46 species, collected on the Coroca, south of Mossamedes. One, said to be new, is indicated, but not named (*Laniidæ*).

Buckley, T. E. [See Shelley, G. E.]

Gurney, J. H. [See Andersson, C. J.]

Heuglin, M. T. von. Ornithologie Nordost-Afrika's, der Nilquellen- und Küsten-Gebiete des Rothen Meeres und des nördlichen Somal-Landes. Lieferungen 24–27. Cassel: 1872. Imp. 8vo, pp. i–xlviii, 853–916, pls. ii., iii., xlii., xliii.

This work makes satisfactory progress. Parts 24 and 25 contain an appendix on the *Accipitres*, containing an excellent series of notes by Dr. Finsch. Part 26 begins the second volume. [See also "Ooology."]

Newton, Alfred. On an undescribed Bird from the Island of Rodriguez. Ibis, 1872, pp. 31–43. [*Aridæ*.]

Reichenow, Dr. A. Briefliche Reiseberichte aus West-Afrika. J. f. O. 1872, pp. 390–392.

Sharpe, R. B. On recent Collections of Birds from the Fantee Country in Western Africa. Ibis, 1872, pp. 66–74.

Contains notices of many rare species. The number now seen by the author from this locality is 271.

——. Contributions to the Ornithology of Madagascar.—Part iii. P. Z S. 1872, pp. 866–869, pl. lxxiii.

Contains a few additional remarks to former papers (Zool. Rec. viii. p. 37).

Sharpe, R. B., & Ussher, H. T. On Three new Species of Birds from the Fantee Country. Ibis, 1872, pp. 181–183. [*Strigidæ, Trogonidæ, Nectariniidæ*.]

Shelley, G. E. A Handbook to the Birds of Egypt. Roy. 8vo. London: 1872, 342 pp., xiv. pls.

A handy volume, collecting together many scattered notes by recent writers on 352 species found in Egypt, to which much original matter is added.

Shelley, G. E., & Buckley, T. E. Two months' Bird-collecting on the Gold Coast. Ibis, 1872, pp. 281–308.

Short notes on many of the birds observed, and descriptions

of their soft parts. The number of species previously known from the locality is increased by 37.

STANLEY, H. M. How I found Livingstone. Travels, Adventures, and Discoveries in Central Africa. London: 1872. 8vo, pp. xiv, 736.

Contains very few notes on birds, beyond a passing allusion to *Indicator* (p. 353).

USSHER, H. T. [See SHARPE, R. B.]

INDIAN REGION.

ANDERSON, A. Notes on the Raptorial Birds of India. [See "ACCIPITRES."]

BALL, V. Notes on a collection of Birds made in the Andaman Islands by Assistant-Surgeon G. E. Dobson during the months of April and May. J. A. S. B. xli. pp. 273–290.

An interesting paper, eclipsed by a subsequent one of the author (Stray Feathers, i. pp. 51–90). A new species (*Campephagidæ*) is described.

BLANFORD, W. T. Account of a visit to the Eastern and Northern Frontiers of Independent Sikkim, with Notes on the Zoology of the Alpine and Subalpine regions.—Part II. Zoology. J. A. S. B. 1872, pp. 30–73.

Contains the zoological portion of the paper noticed last year (Zool. Rec. viii. p. 38), and describes more fully the new species there mentioned.

——. Notes on a collection of Birds from Sikkim. *Tom. cit.* pp. 152–170, pls. vii., viii.

Excellent notes on many rare species, three of which are new (*Timeliidæ, Sylviidæ, Fringillidæ*).

BLYTH, E. Letter from. Ibis, 1872, pp. 87–90.

Besides some corrections of names of Indian birds, the writer gives a list of birds collected by Griffith, probably in the Khasia hills and not in Afghanistan, as stated by Messrs. Horsfield and Moore (Cat. E.-I. Mus.).

BROOKS, W. E. Notes on the Ornithology of Cashmir. J. A. S. B. xli. pp. 73–86.

Contains short but interesting observations, and six new species (*Certhiidæ, Sylviidæ, Motacillidæ*, and *Alaudidæ*).

——. On two undescribed Cashmir Birds [*Sylviidæ*]. *Tom. cit.* pp. 327–329.

——. The Imperial Eagles of India [*Falconidæ*]. P. A. S. B. 1872, pp. 64, 65.

Bruce, H. J. Some of the familiar Birds of India. Am. Nat. 1872, pp. 460–471.

Field-notes on many birds observed at Rahouri, in the Godavery valley.

Godwin-Austen, H. H. Third list of Birds obtained in the Khasi and Garo Hill Ranges, with some corrections and additions to the former lists. J. A. S. B. xli. pp. 142, 143.

Notices 25 species.

Gould, J. The Birds of Asia. Part xxiv. London: 1872.

The species included (most of which have lately been figured elsewhere) are mentioned under their proper families.

Holdsworth, E. W. H. Catalogue of the Birds found in Ceylon; with some Remarks on their Habits and Local Distribution, and Descriptions of two New Species peculiar to the Island. P. Z. S. 1872, pp. 404–483, pls. xvii.–xx.

The number of species is believed to be 323, of which 37 are peculiar to the island; and on most of them interesting notes are given. The new species are mentioned elsewhere (*Turdidæ*, *Meliphagidæ*).

Hume, A. O. Descriptions of Six new Species of Indian Birds [*Muscicapidæ*, *Sylviidæ*, *Fringillidæ*]. Ibis, 1872, pp. 107–111.

——. Stray Feathers: a Journal of Ornithology for India and its Dependencies. Calcutta: Nov. 1872. Part I. pp. 1–50. 8vo.

The first part of this new journal is wholly from its editor's pen; but, except the brief paper next to be noticed, its contents fall under our special division, and will there be mentioned. About a dozen species are described as new, and the occurrence in India of several others for the first time are announced.

——. Contributions to the Ornithology of India. Sindh, No. 1. *Tom. cit.* pp. 44–49.

The preliminary portion of a paper (*tom. cit.* pp. 91–289) published in the present year.

Jerdon, T. C. Supplementary Notes to 'The Birds of India.' Ibis, 1872, pp. 1–22, 114–139, 297–310, pls. i, vi.

This valuable series of notes (Zool. Rec. viii. p. 39) has been most unfortunately brought to a premature end by the author's death.

Layard, E. L. [See Walden, Viscount.]

Stoliczka, F. Notice of the Mammals and Birds inhabiting Kachh [Cutch]. J. A. S. B. xli. pp. 211–258.

The birds are fully treated of, with many excellent field-notes. One new species (*Sylviidæ*) is described.

Swinhoe, R. Descriptions of two new Pheasants and a new *Garrulax* from Ningpo, China [*Turdidæ* and *Phasianidæ*]. P. Z. S. 1872, pp. 550–554.

Walden, [Arthur Hay,] Viscount. On a Collection of Birds recently made by Mr. A. H. Everett in Northern Borneo. Ibis, 1872, pp. 360–383, pl. xii.

Of the 49 species received, one (*Falconidæ*) is new. Synonymy is most elaborately given.

——, & Layard, E. L. On Birds recently observed or obtained in the Island of Negros, Philippines. *Tom. cit.* pp. 93–107. pls. iv.–vi.

Of the 17 species collected 3 are new (*Picidæ, Dicruridæ, Columbidæ*). [See also "Oology."]

AUSTRALIAN REGION.

Buller, W. L. A History of the Birds of New Zealand. 4to. London: 1872. Parts 1–4, pp. 1–288, pls. 1–27.

This admirable work, which places New Zealand in the front rank of countries from an ornithological point of view, does credit to all concerned in it. Nothing seems to have been spared to make it as good as possible; and this fact is the more gratifying as in a few years many of the native species will probably have become extinct, and the opportunity of observing their habits, which are in most cases very fully described, will be lost for ever. The selection of the species for illustration is judicious, and the plates are good. [*Cf.* Ibis, 1872, pp. 194, 338.]

Finsch, O. Zur Ornithologie der Samoa-Inseln. J. f. O. 1872, pp. 30–59.

The researches of Drs. Gräffe and Kubary, supplementing those of Peale, bring the number of species inhabiting the group up to 51, of which 18 are peculiar to it. Their distribution in the three islands composing it is given in a tabular form; and, as usual with this author, the paper contains many valuable critical notes.

——. Remarks on some Birds of New Zealand. Tr. N. Z. Inst. v. pp. 206–212.

An abstract of the following paper.

——. Revision der Vögel Neuseelands. J. f. O. 1872, pp. 81–112, 161–188, 241–274.

Embodies the results of a long study of this remarkable Ornis.

FINSCH, O. Ueber die von Frau Amalie Dietrich in Australien gesammelten Vögel. Verh. z.-b. Wien, xxii. pp. 315–340.
Contains a list of 205 species, mostly from Queensland.

——. [See also HARTLAUB, G.]

GRAY, G. R. Descriptions of new Species of Birds from the Solomon and Banks's groups of Islands. Ann. N. H. (4) v. pp. 327–331.
Five species (*Falconidæ, Meliphagidæ, Columbidæ, Megapodiidæ*) are described from the former group and two (*Campephagidæ, Muscicapidæ*) from the latter. One (*Meliphagidæ*) from the New Hebrides is also described.

HARTLAUB, G., & FINSCH, O. On a fourth Collection of Birds from the Pelew and Mackenzie Islands. P. Z. S. 1872, pp. 87–114.
An important paper, in connexion with the author's former researches (Zool. Rec. iv. pp. 65 & 66, v. p. 51, vi. p. 44, vii. p. 32, viii. p. 40). The number of Pelew birds is now raised to 53, and of those of the Mackenzie group to 20,—11 being described as new in the present paper (*Strigidæ, Caprimulgidæ, Meliphagidæ, Muscicapidæ, Campephagidæ, Columbidæ, Rallidæ, Anatidæ*).

HUTTON, F. W. Notes on some Birds from the Chatham Islands, collected by H. H. Travers, Esq., with Descriptions of two new Species [*Muscicapidæ, Rallidæ*]. Ibis, 1872, pp. 243 250.
A list of 50 species, with brief notes.

——. Notes on some of the Birds brought by Mr. Henry Travers from the Chatham Islands, with Descriptions of the New Species. Tr. N. Z. Inst. v. pp. 222 & 223.
Notices 9 of the species included in the last paper mentioned [*cf. infrà*, TRAVERS, H. H.].

MORTON, JAMES. Notes on some of the New-Zealand Birds. *Tom. cit.* pp. 225 & 226.
Brief notes on 4 species.

PELZELN, A. VON. Ueber eine Sendung von Vögeln von den Aru-Inseln und den Molukken. Verh. z.-b. Wien, xxii. pp. 425–430.
Notes on 28 species, of which one (*Campephagidæ*) is new.

——. Ueber Geschlechtsdifferenzen bei den Meliphagiden der Sandwich Inseln. [See *Meliphagidæ*.]

POTTS, T. H. Notes and descriptions of some Birds lately added to the Museum, Canterbury, New Zealand [*Rallidæ, Laridæ, Apterygidæ*]. Ibis, 1872, pp. 35–39.

Potts, T. H. On the Birds of New Zealand.—Part III. Tr. N. Z. Inst. v. pp. 171–205, pls. xvii. & xviii.

Notes on 32 species, of which 2 (*Scolopacidæ* and *Procellariidæ*) are said to be new, in continuation of former papers (Zool. Rec. vii. p. 38, viii. p. 48), but not, like their contents, so specially restricted to oological matters, though these are largely treated.

Travers, H. H. & W. T. L. On the Birds of the Chatham Islands, with Introductory Remarks on the Avifauna and Flora of the Islands in their relation to those of New Zealand. *Tom. cit.* pp. 212–222.

Contains notes on 43 species, 2 of which (*Muscicapidæ* and *Rallidæ*) are new, but 3, inserted in Capt. Hutton's 'Catalogue' (Zool. Rec. viii. p. 41) as inhabiting the group, are now believed not to occur there, while 5 others are added, 3 of which have not been found in New Zealand, though the Ornis of the two groups is nearly identical [*cf. suprà*, Hutton, F. W.].

Walden, (Arthur Hay,) Viscount. A list of the Birds known to inhabit the Island of Celebes. Tr. Z. S. viii. pp. 23–108, pls. iii.–x. Appendix, pp. 109–118, pls. xi.–xiii.

The important paper mentioned last year (Zool. Rec. viii. p. 41). Referring to the account of the characteristics of the island in Mr. Wallace's work (Zool. Rec. vi. p. 43) as rendering any further observations almost unnecessary, a tabular comparison of its genera with those of the Indian and Australian Regions is made, to determine the affinities of its avifauna. From this it appears that 37 Indian and 23 Australian genera occur there; while 18 Celebean genera are common to both Regions; 9 genera are peculiar to the island, which also possesses one genus in common with the Philippines, one with Sanghir, and one with Ceram; 48 Celebean genera occur in the Indian and not in the Australian Region, and 23 in the Australian Region which are not found in the Indian; so that the Celebean Ornis is rather more Indian than Australian, while retaining an individuality of its own. The whole paper deserves careful study; for not only is the synonymy of each species mentioned very completely treated, but a synopsis of many of the genera is added. A sufficiently good map accompanies the essay.

NEARCTIC REGION.

Allen, J. A. Notes on Birds observed in Western Iowa, in the months of July, August and September; also on Birds observed in Northern Illinois, in May and June, and at Richmond, Wayne Co., Indiana, between June third and tenth. Mem. Bost. Soc. i. pp. 488–526.

This excellent paper, though published in 1868, has hitherto

escaped notice here. In his prefatory remarks the author observes that range in the breeding-season must form the basis for defining the limits of different ornithological districts. He also notices that among migrants of the same species the examples which arrive in spring the earliest are bigger and more brightly tinted than those which come later, and, conversely, on their return the examples last seen are bigger than the summer specimens. Hence it would appear that the largest individuals are those which go furthest north in summer, and, he also adds, are those which live furthest north in winter [but on this point some difference of opinion may be expected]. Some characteristics of the ornithological provinces of North America are next briefly mentioned; and then follow the lists of the species observed, as stated in the title. In Iowa about 108 or 110 species were seen, of which at least 100 breed in the State. For Illinois two lists are given, one of 84 species in Ogle County, the other of 94 species in Cook County. At Richmond 72 species were observed by himself and Dr. Haymond. Some critical notes on supposed species (*Turdidæ, Laridæ*) are added in the course of the paper.

Allen, J. A. Notes of an ornithological reconnoissance of portions of Kansas, Colorado, Wyoming, and Utah. Bull. Mus. C. Z. iii.* pp. 113–183.

The results of the author's researches confirm the general conclusions of his former remarkable paper (Zool. Rec. viii. p. 24), and show the existence of several well-marked geographical races not before chronicled. There are three distinct lists of birds observed at different localities in Kansas, the first enumerating 121 species, the second 61, and the third 25. In Wyoming 41 species were seen. For Colorado also three lists are given, the first of 81 species, the second of 54, and the third of 36. In Utah 137 species were noticed. Finally, a combined list is given, containing the 228 species altogether observed. Many useful remarks are made throughout the paper, which, like most of Mr. Allen's, has a very general bearing.

——. Ornithological Notes from the West. Am. Nat. 1872, pp. 263–280, 343–351, 394–404.

These articles contain a summary of the preceding paper.

Burmeister, H. Synopsis of the *Lamellirostres* of the Argentine Republic. [See "Anseres."]

Coues, Elliott. 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

* The signatures of the sheets are "vol. ii."

and United States Boundary. Royal 8vo. Salem, Mass.: 1872, pp. 361.

This work is divided into three parts—an Introduction, giving a popular elementary explanation of the leading principles of ornithology, an analytical Key to the North-American genera and subgenera, and a Synopsis of the species. The Key is the most original part, forming an artificial analysis to facilitate the discovery of the name of any bird which may chance to come into the hands of one who knows nothing of the subject, and as such is much to be commended. The drawbacks of the book are its size, to some extent unavoidable, and the very poor character of many of the woodcuts. Much of the Introduction will be found useful to learners in all countries. The Synopsis of Fossil Forms is a novel feature; and from it 29 species appear to have been distinguished in the United States. [*Cf.* Am. Nat. vi. pp. 478, 479.]

Finsch, O. Zur Ornithologie Nordwest-Amerika's. Abh. Ver. Brem. iii. pp. 17–86.

Remarks on 113 species, including those described in the paper before noticed (Zool. Rec. vi. p. 47).

Maynard, C. J. The Birds of Florida: containing Original Descriptions of upwards of Two Hundred and Fifty Species. Part I. Salem [Mass.]: 1872. 4to, pp. 32, pl. i.

The beginning of a new work, which seems to be very fairly done. The "prospectus," printed on the wrapper, announces the discovery of a new species (*Emberizidæ*), but it is identical with one already described (*cf.* Zool. Rec. viii. p. 66).

Snow, F. H. Catalogue of the Birds of Kansas. 1872, pp. 8.

Known to the Recorder only by a notice (Am. Nat. vi. p. 359).

NEOTROPICAL REGION.

Burmeister, H. Synopsis of the *Lamellirostres* of the Argentine Republic. [See *Anatidæ*.]

Elliot, D. G. The Humming-Birds of the West Indies. [See *Trochilidæ*.]

Gundlach, J. Neue Beiträge zur Ornithologie Cuba's. J. f. O. 1872, pp. 401–432.

In continuation of the former article (Zool. Rec. viii. p. 42).

Hudson, W. H. On the Birds of the Rio Negro of Patagonia. With notes by P. L. Sclater. P. Z. S. 1872, pp. 534–550, pl. xxxi.

Mentions 48 species, of which 7 have not been met with elsewhere, one of them being new (*Tyrannidæ*).

Hudson, W. H. On the Habits of the Swallows of the Genus *Progne* met with in the Argentine Republic [*Hirundinidæ*].

——. Further Notes on the Swallows of Buenos Ayres [*Hirundinidæ*].

Salvin, O. Notes on the Birds of Nicaragua, based upon a collection made at Chontales by Mr. Thomas Belt. Ibis, 1872, pp. 311–323.

Mentions 82 species. Some remarks on the Nicaraguan Ornis in relation to that of the neighbouring countries are prefixed.

Sclater, P. L. [See Hudson, W. H., and Semper, J. E.]

Semper, J. E. Observations on the Birds of St. Lucia. With notes by P. L. Sclater. P. Z. S. 1872, pp. 647–653.

In continuation of a former paper (Zool. Rec. viii. p. 43). Good field-notes on the 31 species observed.

Sperling, R. M. Letter from. Ibis, 1872, pp. 74–79.

Refers to various South-American Birds and some *Procellariidæ*.

ANATOMY AND PHYSIOLOGY.

Cunningham, R. O. On some points in the Anatomy of the Steamer Duck (*Micropterus cinereus*). [*Cf.* Zool. Rec. viii. p. 74.]

Darwin, F. [See Garrod, A. H.]

Garrod, A. H. On the Mechanism of the Gizzard in Birds. P. Z. S. 1872, pp. 525–529.

Describes this organ in *Anser*.

——. Notes on the Anatomy of the Huia Bird (*Heteralocha gouldi*). *Tom. cit.* pp. 643–647.

This bird shown to belong to the *Sturnidæ*.

——. Note on the Tongue of the Psittacine genus *Nestor*. *Tom. cit.* pp. 787–789.

This organ in *Nestor* differs much from that of the *Trichoglossi*; and the form, therefore, should not be associated with that group.

——. Notes on some of the Cranial Peculiarities of the Woodpeckers. Ibis, 1872, pp. 357–360.

The author says that in the *Picidæ* the vomer is situated between the palatals.

Garrod, A. H., & Darwin, F. Notes on an Ostrich lately living in the Society's Collection. P. Z. S. 1872, pp. 356–363.

Describes morbid appearances, and notices some points of structure.

Gulliver, G. On the Œsophagus of the Pied Hornbill (*Toccus melanoleucus*); being an Appendix to a paper on the Taxonomic Character of the Muscular Sheath of that Tube as regards Sauropsida. *Tom. cit.* pp. 16–18.

The bird examined did not differ from other *Sauropsida* in the want of transversely striated muscular fibre on its œsophagus. (*Cf.* P. Z. S. 1870, p. 283.)

Morse, E. S. On the Tarsus and Carpus of Birds. Ann. Lyc. N. Y. x. pp. 141–158, pls. iv., v.

In continuation of the paper before noticed (Zool. Rec. viii. p. 45), and now printed, P. Am. Ass. 1872, pp. 277, 278. [*Cf.* Am. Nat. vi. pp. 631–635.]

Murie, J. On the Genus *Colius*, its Structure and Systematic Place. [See *Coliidæ*.]

——. On the Motmots and their Affinities. [See *Momotidæ*.]

——. On the Skeleton of *Todus*, with Remarks as to its Allies. [See *Todidæ*.]

——. On the Cranial Appendages and Wattles of the Horned Tragopan. [See *Phasianidæ*.]

Nathusius, W. von. [See "Oology."]

Owen, R. On the Dodo (Part II.) Notes on the Articulated Skeleton of the Dodo (*Didus ineptus*, Linn.) in the British Museum. Tr. Z. S. vii. pp. 513–525, pls. lxiv.–lxvi.

Corrects a mistake in the author's former memoir (Zool. Rec. iii. p. 104), and criticizes that on *Pezophaps* (Zool. Rec. vi. p. 91). [*Cf.* Ann. N. H. (4) ix. pp. 168, 241, 321.]

——. On *Dinornis* (Part XVII.): containing a description of the Sternum and Pelvis, with an attempted Restoration, of *Aptornis defossor*, Owen. Tr. Z. S. viii. pp. 119–126, pls. xiv.–xvi.

In continuation of Part XV. of this series of papers (Zool. Rec. viii. pp. 46, 71). [See *Rallidæ*.]

Parker, W. K. On the Structure and Development of the Crow's Skull. M. Micr. J. 1872, pp. 217–253, pls. xxvii.–xxix.

——. On the Development of the Skull in the Tit and Sparrow-Hawk.—Part I. *Op. cit.* 1873, pp. 6–11, pl. ii. Part II. *Tom. cit.* pp. 45–50, pls. v., vi.

PARKER, W. K. On the Development of the Skull in the Genus *Turdus*. *Tom. cit.* pp. 102–107, pls. viii.–x.

All these papers were read in 1872, and though the first only was published in that year, it is a matter of convenience to enter them together, the more so since the last is really the oldest in date. The author throughout shows his accustomed love of work and power of description, but, as usual, is chary of deductions. However, in the first paper, he declares *Corvus* to be "the great subrational chief of the whole kingdom of the birds;" and while adopting generally the views of Prof. Huxley (Zool. Rec. iii. p. 46, iv. p. 34), terms his *Celeomorphæ* (=*Pici*) *Saurognathæ*. In the second he admits the relationship of *Cariama* to the *Gruidæ* and *Gallinæ*, but places it as the lowest extant form of *Accipitres*.

SCLATER, P. L. Observations on the Systematic Position of the Genera *Peltops*, *Eurylæmus*, and *Todus*. [See *Todidæ*, *Eurylæmidæ*, *Muscicapidæ*.]

STÖLKER, C. Beiträge zur Pathologie der Vögel. J. f. O. 1872, pp. 1–19.

OOLOGY.

BUCKLEY, HENRY. On some new or rare Birds' Eggs. P. Z. S. 1872, pp. 625, 626.

Notices those of *Falco polyagrus*, *Elanoides furcatus*, *Ictinia mississippiensis*.

HEUGLIN, M. T. VON. Ornithologie Nordost-Afrika's, u. s. w. [See "ETHIOPIAN REGION."]

Plates xlii. and xliii. contain figures of the eggs of *Textor alecto*, *Hyphantornis habessinica*, *H. atrigularis*, *H. guerini*, *H. vitellina*, and *H. galbula*, *Psalidoprocne pristoptera*, *Hirundo æthiopica*, *Nectarinia metallica*, *Cisticola cursitans*, *Drymœca gracilis*, *Caprimulgus isabellinus*, *Cercotrichas erythroptera*, *Argya acaciæ*, *Saxicola isabellina*, *Acrocephalus stentorius*, *Aedon galactodes*, and *Pycnonotus arsinoe*.

HOLTZ, L. Ueber Molobrus-Eier, zu Cantagallo in Brasilien von Herrn C. Euler gesammelt. J. f. O. 1872, pp. 193–201.

Describes the variations in the eggs of *Molobrus*.

LAYARD, E. L. [See WALDEN, Viscount.]

NATHUSIUS, W. VON. Ueber der inneren Bau einiger Gänse-Eier mit doppeltem Dotter, nebst einigen weiteren Bemerkungen über Species-Unterscheide bei Eierschalen. J. f. O. 1872, pp. 321–332, tab. ii.

In continuation of former papers (Zool. Rec. viii. p. 48).

POTTS, T. H. On the Birds of New Zealand.—Part III. [See "AUSTRALIAN REGION."]

The nest of *Certhiparus novæ-zelandiæ* and that of *Creadion carunculatus* figured (pl. xvii.).

Walden, [A. Hay,] Viscount, & Layard, E. L. On Birds recently observed or obtained in the Island of Negros, Philippines. Ibis, 1872, pp. 105–107.

Eggs obtained by Mr. L. C. Layard, and attributed to *Rhipidura nigritorques*, *Munia jagori*, *Corydalla malayana*, *Excalfactoria chinensis*, and *Turnix ocellata* are described.

ACCIPITRES.

Anderson, A. Notes on the Raptorial Birds of India.—Part II. P. Z. S. 1872, pp. 68–81. Additional Notes, pp. 619–623.

In continuation of the former paper (Zool. Rec. viii. p. 49). The first article treats of 47 species, the second of 5.

Haast, J. Notes on *Harpagornis moorei*, an extinct gigantic Bird of Prey, containing description of femur, ungual phalanges, and rib. Tr. N. Z. Inst. iv. pp. 192–196, pls. x., xi.

Harpagornis, gen. nov., foss., must have been capable of taking *Dinornis*. *Id. ut suprà.*

Vulturidæ.

Vultur monachus figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xiii.

Otogyps auricularis and *O. nubicus* are distinct species. A. E. Brehm, J. f. O. 1872, p. 71.

Gypiscus, gen. nov., type *Vultur pileatus*, Burch. C. J. Sundevall, Av. Tent. p. 110 (1873).

Neophron percnopterus figured. J. Gould, B. Gt. Br. pt. 21.

Gypaetus barbatus figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xv.

Falconidæ.

Aquila danana, sp. n., foss., from the pliocene of Nebraska. O. C. Marsh, Am. J. Sc. (3) iii. p. 125.

Aquila clanga, remarks on. J. H. Gurney, Ibis, 1872, pp. 328 & 329.

Aquila hastata, notes on. A. Anderson, P. Z. S. 1872, pp. 69–74, 622, 623.

Aquila crassipes, Hodgs., and *A. bifasciata*, J. E. Gray, in India. W. E. Brooks, J. A. S. B. 1872, pp. 64 & 65; P. Z. S. 1872, pp. 502 & 504. A. Anderson, *tom. cit.* pp. 620–622.

Aquila imperialis, *A. nævia*, *A. nævioides*, and allies. H. E. Dresser, *tom. cit.* pp. 863–865.

Aquila pennata breeding in Macedonia, T. Krüper, J. f. O. 1872, pp. 59–64; in Southern Russia, L. Holtz, *tom. cit.* pp. 286–305; with *A. minuta* in the last-mentioned locality, H. Goebel, *tom. cit.* pp. 454–463.

Haliaetus albicilla in India (Zool. Rec. viii. p. 49) and *H. lineatus*, Hardw. E. Blyth, Ibis, 1872, p. 88.

Helotarsus ecaudatus figured. M. T. von Heuglin, Orn. Nordost-Afr. pl. ii.

Archibuteo lagopus and *A. hemiloptilus* in Eastern Siberia. L. Taczanowski, J. f. O. 1872, pp. 189–192.

Buteo ferox figured. G. E. Shelley, B. Egypt, pl. ix.

Leucopternis, the genus revised. O. Salvin, Ibis, 1872, pp. 239–243.

L. plumbea, sp. n., from Ecuador. *Id. ut suprà*, p. 240, pl. viii.

Hamirostrum, nom. gener. emend.,=*Rostrhamus*, Less. C. J. Sundevall, Av. Tent. p. 109 (1873).

Rostrhamus sociabilis figured. C. J. Maynard, B. Flor. pl. i.

Elanus cæruleus in Ireland: J. F. Dillon, Ibis, 1872, p. 470. Breeding in India: A. O. Hume, Str. F. i. pp. 21–26.

Milvus major (Zool. Rec. vi. p. 39) is *M. melanotis*. W. T. Blanford, J. A. S. B. 1872, p. 153.

Milvus migrans figured. J. Gould, B. Gt. Br. pt. 22.

Machærhamphus [olim *Stringonyx*] *anderssoni* (Zool. Rec. viii. p. 49), its sternum and trachea figured. C. J. Andersson, B. Dam. Ld. pls. 1–3.

Falco gyrfalco, *F. islandus*, *F. candicans* (light and dark races) figured. J. Gould, B. G. Br. pt. 22.

Pnigohierax, gen. n. Type *Falco lanarius*, Pall. [*F. sacer*, auctt.] No characters given. J. Cabanis, J. f. O. 1872, p. 156.

Falco atriceps (Zool. Rec. viii. p. 50). Further notes on. T. C. Jerdon, Ibis, 1872, p. 1.

Falco barbarus in Spain: H. Saunders, P. Z. S. 1872, p. 356. In India: A. O. Hume, Str. F. i. pp. 19–21.

Falco æsalon, its northern range. M. T. von Heuglin, J. f. O. 1872, p. 464.

Lithofalco feildeni, sp. n., from Thayet-Myo: A. O. Hume, Pr. A. S. B. 1872, p. 70. Is *Polihierax insignis* (Zool. Rec. viii. p. 50): Ld. Walden, Ibis, 1872, p. 471.

Hieracidea brunnea distinct from *H. novæ-zelandiæ*: W. L. Buller, Ibis, 1872, pp. 332, 333. The latter figured: *Id.* B. N. Zeal. part 1.

Spilornis pallidus, sp. n., from Northern Borneo. Ld. Walden, Ibis, 1872, p. 363.

Accipiter albigularis, sp. n., from the Solomon Islands. G. R. Gray, Ann. N. H. (4) v. p. 327.

Accipiter nisus. Races and changes of plumage figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xi.

Nisus badius breeding in Macedonia. T. Krüper, J. f. O. 1872, pp. 129–131.

Teraspiza rhodogastra, ♂ juv. figured. Ld. Walden, Tr. Z. S. viii. pl. 11.

Asturisca, nom. gener. emend.,=*Asturina*, Vieill. C. J. Sundevall, Av. Tent. p. 107 (1873).

Asturina schistacea, Sundev. (Œfv. Ak. Förh. 1849, p. 132), is a *Leucopternis*. O. Salvin, Ibis, 1872, p. 242.

Circus gouldi figured. W. L. Buller, B. N. Zeal. pt. 1.

STRIGIDÆ.

Leuchybris and *Smilonyx*, genn. renomm.,=*Nyctea*, Steph., and *Ketupa* Less., respectively. C. J. Sundevall, Av. Tent. p. 105 (1873).

Nycthierax, gen. renom.,=*Surnia*, Dum. *Id. op. cit.* p. 106 (1873).

Bubo leptosteus, sp. n., foss. from the lower tertiary of Wyoming territory. O. C. Marsh, Am. J. Sc. (3) ii. p. 126.

Surnia ulula (L.) from Europe and Asia, and *S. funerea* (L.) from America, are distinct species, and both are figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xi.

Spiloglaux novæ-zelandiæ and *Sceloglaux albifacies* figured. W. L. Buller, B. N. Zeal. pt. 1.

Ulula lapponica. Its eggs from Torneå. E. Rey, J. f. O. 1872, p. 232.

Nyctala albifrons (Shaw) and *N. kirtlandi*, Hoy, are *N. richardsoni*, juv., which is not distinct from *N. tengmalmi* of Europe. D. G. Elliot, Ibis, 1872, pp. 48–52.

Nyctala tengmalmi figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xiv.

Ninox obscurus (sp. n.) from the Nicobars. A. O. Hume, Str. F. i. p. 11.

Noctua podargina, sp. n., from the Pelew Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, p. 90.

Athene spilogastra figured. M. T. von Heuglin, Orn. Nordost-Afr. pl. iv.

Glaucidium ferrugineum in Arizona. E. Coues, Am. Nat. 1872, p. 370.

Ptiloscelus amhersti, Tickell, is *Huhua nipalensis*, juv. E. Blyth, Ibis, 1872, p. 89.

Huhua shelleyi, sp. n., from Fantee. R. B. Sharpe & H. T. Ussher, *tom. cit.* p. 182.

Ephialtes brucii, sp. n., from Ahmadnagar. A. O. Hume, Stray F. i. p. 8.

Strix insularis, sp. n., from St. Vincent, Cape-Verde Islands. A. von Pelzeln, J. f. O. 1872, pp. 23, 24.

Strix amauronota, sp. n., from Luzon. J. Cabanis, *tom. cit.* p. 316.

Strix indica and *S. candida* figured. J. Gould, B. As. pt. xxiv.

PSITTACI.

Strigopidæ.

Strigops habroptilus figured. W. L. Buller, B. N. Zeal. pt. 1.

Plictolophidæ.

Camptolophus, gen. renom., = *Plyctolophus*, Vig. C. J. Sundevall, Av. Tent. p. 69.

Aridæ.

Palæornis exsul, sp. n., from Rodriguez. Alfred Newton, Ibis, 1872, p. 33.

Platycercus novæ-zelandiæ and *P. auriceps* figured. W. L. Buller, B. N. Zeal. pt. 1.

Anoplorhynchus, nom. gener. emend., = *Anodorhynchus*, Spix, sive *Anodontorhynchus*, Agass. C. J. Sundevall, Av. Tent. p. 70.

Psittacidæ.

Rhodurus, gen. n. Type *Psittacus erithacus*, L. C. J. Sundevall, Av. Tent. p. 69.

Trichoglossidæ.

Calliptilus, gen. n. (= *Phigys*, Less.). Type *Psittacus sŏlitarius*, Lath. C. J. Sundevall, Av. Tent. p. 71.

Coriophilus, nom. gener. emend., = *Coriphilus*, Wagl. *Id. loc. cit.*

Loriculus chrysonotus, sp. n., from Zebu, Philippines. P. L. Sclater, Ibis, 1872, pp. 323–325, pl. xi.

Loriculus quadricolor, sp. n., from the Togian Islands. Ld. Walden, Ann. N. H. (4) ix. p. 398.

Trichoglossus meyeri (Zool. Rec. viii. p. 52) figured. *Id.* Tr. Z. S. viii. pl. 4.

Nestor hypopolius. Its tongue does not resemble that of *Trichoglossus.* A. H. Garrod, P. Z. S. 1872, pp. 787, 789.

Nestor meridionalis. Its habits. W. T. L. Travers, Tr. N. Z. Inst. iv. p. 209.

PICARIÆ.

Picidæ.

Uintornis lucaris, gen. et sp. nov., foss., from the lower tertiary of Wyoming territory. O. C. Marsh, Am. J. Sc. (3) iv. p. 259.

Garrod, A. H. Notes on some of the Cranial Peculiarities of the Woodpeckers. Ibis, 1872, pp. 357–360.

As to the presence or absence of a vomer, which the author believes to exist.

Gecinus sharpii, sp. n., from Southern Spain: H. Saunders, P. Z. S. 1872, p. 153. Figured: R. B. Sharpe & H. E. Dresser, B. Eur. part xii.

Picus syriacus, *P. lilfordi*, *P. minor*, *Picoides tridactylus*, *Gecinus canus* figured. *Id. op. cit.* pts. x., xi., & xiii.

Micropternus burmanicus, sp. n., from Burmah. A. O. Hume, P. A. S. B. 1872, p. 70.

Chrysocolaptes xanthocephalus, sp. n., from Negros. Ld. Walden & E. L. Layard, Ibis, 1872, p. 99, pl. 4 [♀].

Jynx indica, Gould, is *J. pectoralis.* E. Blyth, *tom. cit.* p. 90.

Trogonidæ.

Hapaloderma constantia, sp. n., from Fantee. R. B. Sharpe & H. T. Ussher, Ibis, 1872, p. 181.

Meropidæ.

Merops ægyptius, its range in India: G. F. L. Marshall, Ibis, 1872, pp. 203–205. Figured, with *M. viridis*, G. E. Shelley, B. Egypt, pl. vii.

Momotidæ.

Murie, J. On the Motmots and their affinities. Ibis, 1872, pp. 383–412, pls. xiii.–xv.

Describes the skull and sternum of *Momotus lessoni*, and in detail the skeleton of *Baryphthengus ruficapillus* and *Eumomota superciliaris.* A comparison is then made of the osteology of the *Momotidæ* with that of the *Todidæ*, *Coraciidæ*, *Meropidæ*, *Alcedinidæ*, and other families; and after a consideration of various facts as to habits, structure, and geographical distribution, and of opinions as to their supposed affinities, arrives at the conclusion that the four families just named best accord with the *Momotidæ*, and of them the *Todidæ* are most akin. If it is necessary to group them more nearly, Mr. Blyth's term "Serratirostres" (Mag. Nat. Hist. New Ser. ii. p. 422) may be used. Only four genera of *Momotidæ* (*Momotus*, *Barypthengus*, *Hylomanes*, and *Eumomotus*) seem well established.

Todidæ.

Murie, J. On the skeleton of *Todus*, with Remarks as to its Allies. P. Z. S. 1872, pp. 664–680, pl. lv.

Describes in great detail the skeleton of *Todus viridis*, and shows that the bird is a Coccygomorph, its nearest living allies being the *Momotidæ* and *Alcedinidæ*, but having also Muscicapine, Meropine, Galbuline, and Bucconine tendencies, as shown by its habits, food, and other peculiarities.

Todus is allied to *Alcedo*, and still more to *Momotus*. P. L. Sclater, Ibis, 1872, pp. 179, 180.

Alcedinidæ.

Tanysiptera riedeli (Zool. Rec. iii. p. 79) is from Kordo, and not Celebes. T. G. F. Riedel, P. Z. S. 1872, p. 1.

Capitonidæ.

Smilorrhis, gen. n. Type *Megalæma leucotis*, Sund. C. J. Sundevall, Av. Tent. p. 75 (1873).

Bucerotidæ.

Toccus melanoleucus, its œsophagus described. G. Gulliver, P. Z. S. 1872, pp. 16–18.

Buceros exaratus, figured. Ld. Walden, Tr. Z. S. viii. pl. 5.

Cranorrhinus cassidix, heads of ♂ ad. & juv. & ♀ figured. *Id. l. c.* pp. 48, 49.

Anorhinus austeni, sp. n. (= *A. galeritus*, Godwin-Austen, J. A. S. B. 1870, p. 96, *nec* Temm.), from Cachar. T. C. Jerdon, Ibis, 1872, p. 6.

Berenicornis tickelli is a *Toccus*. *Id. tom. cit.* p. 5.

Coliidæ.

Murie, J. On the Genus *Colius*, its Structure and Systematic Place. Ibis, 1872, pp. 262–280, pl. x.

After treating of the position assigned to this form by various writers, the author describes its pterylosis and the skeleton of *C. leucotis*; he then enters at length upon its structural affinities, comparing them with the *Psittaci*, the *Musophagidæ*, *Coraciidæ*, and *Bucerotidæ*, as well as with *Opisthocomus*, finally showing that it is not a true Passerine or Coracomorph, or very nearly allied to any of the groups named, but is, equally with the *Celeomorphæ* and *Cypselomorphæ*, annectent betwixt the *Coccygomorphæ* and *Coracomorphæ*; requiring recognition, therefore, as the type of a distinct group, *Coliomorphæ*.

Cuculidæ.

Cuculus canorus in Celebes. Lord Walden, Tr. Z. S. viii. p. 115.

Cuculus indicus and *C. canorinus* in Siberia. J. Cabanis, J. f. O. 1872, pp. 235, 236.

Hierococcyx crassirostris, sp. n., from Celebes, Ld. Walden, Ann. N. H. (4) ix. p. 305. Figured: *Id.* Tr. Z. S. viii. pl. 13.

Polyphasia rufiventris, sp. n. (*P. tenuirostris*, Jerd. B. Ind. no. 209, *nec*

Gray); *P. passerina* (vel *nigra*) figured. T. C. Jerdon, Ibis, 1872, pp. 14, 15, pl. i.

Eudynamis taitensis figured. W. L. Buller, B. N. Zeal. pt. ii.

Phœnicophaes calorhynchus, P. curvirostris, P. erythrognathus, P. pyrrhocephalus. Heads figured. Ld. Walden, Tr. Z. S. viii. p. 53.

Centrococcyx affinis. Synopsis of its allies. *Id. tom. cit.* pp. 56–60.

Chrysococcyx plagosus in the Chatham Islands. H. H. Travers, Tr. N. Z. Inst. v. p. 216.

Centropus ægyptius figured. G. E. Shelley, B. Egypt, pl. v.

Coccyzus americanus at Buenos Ayres. P. L. Sclater, P. Z. S. 1872, p. 496.

Coccyzus erythrophthalmus in Ireland. *Id. tom. cit.* p. 681.

Caprimulgidæ.

Caprimulgus phalæna, sp. n., from the Pelew Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, p. 91.

Caprimulgus ægyptius figured. G. E. Shelley, B. Egypt, pl. viii.

Cypselidæ.

Cypselus infumatus (Zool. Rec. vii. p. 44) figured. J. Gould, B. As. pt. xxiv.

Cypselus pallidus (Zool. Rec. vii. p. 44) in Madeira and the Canaries: F. Godman, Ibis, 1872, p. 170. In Spain: L. H. Irby, *tom. cit.* p. 199; H. Saunders, P. Z. S. 1872, p. 356.

Trochilidæ.

Elliot, D. G. The Humming-birds of the West Indies. Ibis, 1872, pp. 345–357.

Treats critically of the species (17 in number, according to the author) which inhabit the West-India Islands, and shows their geographical distribution in each.

Lampornis virginalis, Gould, is *L. dominicus* (Linn.), and *L. porphyrurus* (Shaw & Nodder) is the true *L. mango* (L.). *Id. ut suprà*, pp. 349, 350.

Chrysolampis chlorolæmus (Zool. Rec. vii. p. 44) referred to *Lampornis*, and renamed *L. calosoma*. *Id. ut suprà*, p. 351.

Eulampis chlorolæmus, Gould, and *E. longirostris*, Gould, are not separable from *E. holosericeus* (L.). *Id. ut suprà*, p. 352.

Eriocnemis dyselius, sp. n., from Ecuador (?). *Id. t. c.* p. 294.

Chlorostilbon pumilus, sp. n., from Ecuador. J. Gould, Ann. N. H. (4) ix. p. 195.

Heliangelus micraster, sp. n., from Ecuador. *Id. l. c.*

Iolæma whiteliana, sp. n., from Peru. *Id. op. cit.* x. p. 452.

Adelomyia chlorospila and *A. cervina*, spp. nn., from Peru and Columbia. *Id. t. c.* pp. 452, 453.

PASSERES.

Pittidæ.

Pitta arquata (Zool. Rec. viii. p. 56) and *P. megarhyncha* figured. J. Gould, B. As. pt. xxiv.

Paictes, gen. renom., = *Philepitta*, I. Geoffr. C. J. Sundevall, Av. Tent. p. 63.

Formicariidæ.

Diallactes. Synopsis of the seven species of the genus, including *D. semifasciatus*, sp. n., from Para and Guiana, and *D. granadensis*, sp. n., from Bogota. J. Cabanis, J. f. O. 1872, pp. 233, 234.

Menuridæ.

Orthonyx albicilla and *O. ochrocephala* figured. W. L. Buller, B. N. Zeal. part ii.

Meliphagidæ.

Pelzeln, A. von. Ueber Geschlechtsdifferenzen bei den Meliphagiden der Sandwich-Inseln. J. f. O. 1872, pp. 24–30.

Describes the sexual differences or resemblances in *Mohoa nobilis*, *M. apicalis*, *Drepanis pacifica*, *D. coccinea*, *Himatione sanguinea*, *H. maculata*, Cab., *H. flava* (Blox.) (each considered to be distinct), *Hemignathus lucidus*, *Loxops coccineus*, and *Psittirostra psittacea*.

Zosterops ceylonensis, sp. n., from Ceylon, and *Z. palpebrosus* figured. E. W. H. Holdsworth, P. Z. S. 1872, p. 459, pl. xx.

Zosterops intermedia and *Z. atrifrons* figured. Ld. Walden, Tr. Z. S. viii. pl. ix.

Zosterops hypolais and *Z. oleaginea*, spp. nn., from Uap, Mackenzie Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, p. 95.

Tephras finschi (Zool. Rec. v. p. 79) is a *Zosterops*. *Iid. tom. cit.* p. 96.

Glycyphila flavitincta, sp. n., from the New Hebrides, G. R. Gray, Ann. N. H. (4) v. p. 331.

Philemon sclateri, sp. n., from the Solomon Isles. *Id. tom. cit.* p. 327.

Myzomela chloroptera, sp. n., from Celebes. Ld. Walden, *op. cit.* ix. p. 399.

Prosthemadera novæ-zelandiæ and *Pogonornis cincta* figured. W. L. Buller, B. N. Zeal. part ii.

Melitograis, gen. nov. Type *M. striata*, sp. n., from New Guinea. C. J. Sundevall, Av. Tent. p. 50.

Nectariniidæ.

Nectarinia metallica, figured. G. E. Shelley, B. of Egypt, pl. iv.

Prionochilus vincens, sp. n., from Ceylon. P. L. Sclater, P. Z. S. 1872, pp. 729, 730.

Dicæum retrocinctum, sp. n., from the Philippine Islands. J. Gould, Ann. N. H. (4) x. p. 114.

Pholidornis rubrifrons, sp. n., from Fantee. R. B. Sharpe & H. T. Ussher, Ibis, 1872, p. 182.

Eurylæmidæ.

Eurylæmus and allied genera (of which *Peltops* is not one) belong to the *Passeres*. P. L. Sclater, Ibis, 1872, pp. 178–180.

Cotingidæ.

Hylocosmia, gen. renom., = *Cotinga*, Briss. C. J. Sundevall, Av. Tent. p. 62.

Timeliidæ.

Timelia, nom. gener. emend.,= *Timalia*. C. J. Sundevall, Av. Tent. p. 11.

Timalia jerdoni, sp. n., from the Khasia Hills. Ld. Walden, Ann. N. H. (4) x. p. 61.

Trichastoma rufipennis, sp. n., from Gaboon. R. B. Sharpe, *tom. cit.* p. 451.

Oxylabes madagascariensis (Zool. Rec. vii. p. 47) figured. *Id.* P. Z. S. 1872, pl. lxxiii.

Brachypteryx (?) *palliseri* figured. E. W. H. Holdsworth, P. Z. S. 1872, p. 443, pl. xviii.

Nannothera, gen. nov. Type *Brachypteryx sepiaria*, Horsf. C. J. Sundevall, Av. Tent. p. 11.

Hadropezus, gen. renom.,= *Turdinus*, Blyth. *Id. op. cit.* p. 11.

Turdinus brevicaudatus figured. J. Gould, B. As. pl. xxiv.

Pellorneum palustre, sp. n., "T. C. Jerdon," from the Khasia Hills: *Id. loc. cit.* Again described, A. O. Hume, Str. F. i. p. 4.

Pellorneum mandellii, sp. n., from Sikkim. W. T. Blanford, J. A. S. B. 1872, p. 165, pl. vii. fig. 2.

Pellorneum subochraceum (Zool. Rec. viii. p. 57) is probably *P. tickelli*. *Id.* Ibis, 1872, p. 87.

Mixornis. Synonymy of the five known species. Ld. Walden, Ibis, 1872, pp. 375 & 376.

Setornis criniger figured. *Id. tom. cit.* p. 377, pl. xii.

Hyloterpe sulfuriventer, sp. n., from N. Celebes. *Id.* Ann. N. H. (4) ix. p. 399.

Hyloterpe philippinensis, sp. n., from Luzon. *Id. op. cit.* x. p. 252.

Aethorhynchus, gen. nov. Type *Iora lafresnayii*, Hartl. C. J. Sundevall, Av. Tent. p. 8.

Cholornis paradoxa (Zool. Rec. viii. p. 57) figured. J. Verreaux, N. Arch. Bull. vii. pl. i. fig. 1.

Trochalopterum formosum and *Pterorhinus lanceolatus* (Zool. Rec. viii. p. 57) figured. *Id. tom. cit.* pl. ii.—The former figured with *T. phæniceum*, J. Gould, B. As. pt. xxiv.

Hirundinidæ.

Progne chalybea, *P. purpurea*, and *P. tapera*, their habits in the Argentine Republic. W. H. Hudson, P. Z. S. 1872, pp. 605–609.

Atticora cyanoleuca and *Hirundo leucorrhoa*, their habits. *Id. tom. cit.* pp. 844–846.

Ptionoprogne pallida, sp. n., from Sindh. A. O. Hume, Str. F. i. p. 1. [Is *Cotyle obsoleta*, Cab.: W. T. Blanford, Ibis, 1873, p. 214.]

Oriolidæ.

Oriolus formosus, sp. n., from the Sangi [? Sanghir] Islands. J. Cabanis, J. f. O. 1872, pp. 392 & 393.

Tyrannidæ.

Coues, E. Studies of the *Tyrannidæ*.—Part I. Revision of the genus *Myiarchus*. P. Ac. Philad. 1872, pp. 56–81.

With *Myiarchus* are united *Kaupornis*, *Blacicus*, and *Myionax*. Five species are unknown to the author, who gives the history and synonymy of the remaining nine:—1. *M. validus*; 2. *M. crinitus*, with three varieties, *a. crinitus*, *β. irritabilis=erythrocercus*, Scl. & Salv. (Zool. Rec. iii. p. 83), *mexicanus* and *yucatanensis*, Lawr., *γ. cooperi* (Zool. Rec. viii. p. 58); 3. *M. cinerascens*; 4. *M. tyrannulus=panamensis* and *venezuelensis*, Lawr. (Zool. Rec. ii. p. 107); 5. *M. phæocephalus*; 6. *M. lawrencii=rufimarginatus* and *nigricapillus*, Cab.; 7. *M. nigriceps*; 8. *M. stolidus*, with three varieties, *α. stolidus = dominicensis*, Bryant, *β. phœbe=lucaysiensis* and *bahamensis*, Bryant, *γ. antillarum*; 9. *M. tristis*.

Pyrocephalus rubineus, its habits. W. H. Hudson, P. Z. S. 1872, pp. 808–810.

Colorhamphus, gen. nov. Type *Myiobius parvirostris*, Gould. C. J. Sundevall, Av. Tent. p. 59.

Milvulus forficatus in New Jersey. C. C. Abbott, Am. Nat. p. 367.

Milvulus tyrannus. Its nest, with eggs of the parasitic *Molothrus bonariensis*, described. W. H. Hudson, P. Z. S. 1872, pp. 862 & 863.

Cnipolegus hudsoni, sp. n., from the Rio Negro, Patagonia. P. L. Sclater, *tom. cit.* p. 541, pl. xxxi.

Dicruridæ.

Entomoletes, gen. renom., = *Chaptia*, Hodgs. C. J. Sundevall, Av. Tent. p. 22.

Dicrurus mirabilis, sp. n., from Negros, Philippine Is. Ld. Walden & E. L. Layard, Ibis, 1872, p. 103, pl. v.

Laniidæ.

Lanius algeriensis at sea near Teneriffe. G. E. Shelley & T. E. Buckley, Ibis, 1872, p. 281.

Lanius phœnicurus. Its synonymy, O. Finsch, Verh. z.-b. Wien, xxii. pp. 258–260.

Lanius lahtora, *L. minor*, and *Telephonus erythropterus* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. xi., xiii.

Dryoscopus —, sp. n., from the Coroca, south of Mossamedes, is indicated but not named. J. V. Barboza du Bocage, Jorn. Sc. Lisb. 1872.

Cyanolestes, nom. gener. emend., = *Cyanolanius*. C. J. Sundevall, Av. Tent. p. 21.

Artamus monachus figured. Ld. Walden, Tr. Z. S. viii. pl. 6. fig. 1.

Campephagidæ.

Graucalus temmincki figured. Ld. Walden, Tr. Z. S. viii. pl. 12.

Graucalus dobsoni, sp. n., from the Andamans. V. Ball, J. A. S. B. xli. p. 281.

Colluricincla concinna (Zool. Rec. viii. p. 58) is after all distinct, and is referred to *Graucalus*. F. W. Hutton, Tr. N. Z. Inst. v. pp. 226 & 227.

Colluricincla parvissima [!], sp. n., from Rockingham Bay. J. Gould, Ann. N. H. (4) x. p. 114.

Campephaga nesiotis and *C. monacha*, spp. nn., from Uap, Mackenzie

Islands, and the Pelew Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, pp. 98 & 99.

Volvocivora morio figured. Ld. Walden, Tr. Z. S. viii. pl. 8. fig. 1.

Lalage leucopygialis, sp. n., from Menado. *Id. tom. cit.* p. 69, pl. 8. fig. 2.

Lalage banksiana, sp. n., from Banks's Isles. G. R. Gray, Ann. N. H. (4) v. p. 329.

Pachycephala senex, sp. n., from the Aru Islands. A. von Pelzeln, Verh. z.-b. Wien, xxii. p. 429.

Muscicapidæ.

Myialestes helianthea (Zool. Rec. ii. p. 109) figured. Ld. Walden, Tr. Z. S. viii. pl. 7. fig. 1.

Siphia minuta, sp. n., from Sikkim. A. O. Hume, Ibis, 1872, p. 110. [Is *S. tricolor*, Hodgs. W. E. Brooks, *tom. cit.* p. 470.]

Siphia hyperythra in N.W. India. Ld. Walden, Ibis, 1872, p. 472.

Erythrosterna hyperythra (Zool. Rec. iii. p. 93) figured. E. W. H. Holdsworth, P. Z. S. 1872, pl. xvii.

Cyornis rufigula (Zool. Rec. ii. p. 110) figured. Ld. Walden, Tr. Z. S. viii. pl. 7. fig. 3.

Cyornis tickelliæ is *C. banyumas* [Blyth *nec* Horsf., *C. jerdoni*, Gray], ♀. J. H. Lloyd, Ibis, 1872, p. 198. Believed to be a distinct species: Ld. Walden, *tom. cit.* p. 330.

Diaphorophyia blissettii, sp. n., from the Gold Coast. R. B. Sharpe, Ann. N. H. (4) x. p. 451.

Pachyprora, gen. nov. Type *Muscicapa capensis* (L). C. J. Sundevall, Av. Tent. p. 24. [=*Batis*, Boie: *cf.* R. B. Sharpe, Ibis, 1873, p. 160.]

Hypsipus, gen. renom., = *Lanioturdus*, Waterh. *Id. op. cit.* p. 24.

Empidothera, gen. renom., = *Cryptolopha*, Blyth, *nec* Swains. *Id. op. cit.* p. 25.

Peltops is allied to *Monarcha* and *Machærorhynchus*, not to *Eurylæmus*. P. L. Sclater, Ibis, 1872, p. 177.

Hypothymis puella, Wall., figured. Ld. Walden, Tr. Z. S. viii. pl. 7. fig. 2.

Rhipidura spilodera, sp. n., from Banks's Isles. G. R. Gray, Ann. N. H. (4) v. p. 333.

Rhipidura versicolor, sp. n., from Uap, Mackenzie Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, p. 97.

Petræca traversi, sp. n., from the Chatham Islands. W. L. Buller, B. N. Zeal. pt. iii. (June); F. W. Hutton, Ibis, 1872, p. 245 (July), H. H. Travers, Tr. N. Z. Inst. v. p. 216.

Mniotiltidæ.

Salvin, Osbert. Remarks on the Mniotiltine genus *Geothlypis*. Ibis, 1872, pp. 147–152.

Reviews the species, and gives details of their migrations and geographical distribution.

Geothlypis chiriquensis, sp. n., from Chiriqui. O. Salvin, *ut suprà*, p. 148.

Turdidæ.

Turdus pilaris juv., *T. iliacus*, *T. merula*, and *T. torquatus* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. x., xi., xiii.

Turdus dissimilis figured. T. C. Jerdon, Ibis, 1872, p. 136, pl. vii.

Turdus aurorcus, Pall., = *T. nævius*, auctt. recc., from Western America. J. Cabanis, J. f. O. 1872, pp. 157.

Turdus swainsoni, *T. pallasi*, and *T. fuscescens* are the only species of the section to which they belong. J. A. Allen, Mem. Bost. Soc. i. pp. 507–516.

Oreocincla heinii (Mus. Hein. i. p. 6) is certainly from North Australia (*cf.* J. f. O. 1857, p. 159, note). J. Cabanis, J. f. O. 1872, pp. 236, 237.

Oreocincla iodura, sp. n., from Queensland. J. Gould, Ann. N. H. (4) ix. p. 401. [Is *O. heinii*.]

Oreocincla varia (Pall. *nec* Horsf.) is the only species which visits Europe, on the continent of which it has occurred nearly 20 times, and in Britain 8 or 9 times. A. Newton, Yarr. Br. B. ed. 4, i. pp. 251–257.

Geocichla erythronota figured. Ld. Walden, Tr. Z. S. viii. pl. 6. fig. 2.

Antimimus, gen. nov. Type *Turdus rufus*, L. C. J. Sundevall, Av. Tent. p. 13.

Harporhynchus crissalis breeding in Arizona. E. Coues, Am. Nat. 1872, pp. 370, 371.

Hypsipetes ganeesa distinct from *H. neilgherriensis*. The former redescribed. J. H. Lloyd, Ibis, 1872, p. 202.

Garrulax picticollis, sp. n., from Ningpo. R. Swinhoe, P. Z. S. 1872, p. 554.

Crateropus acaciæ figured. G. E. Shelley, B. Egypt, pl. 1.

Turnagra crassirostris and *T. hectori* (Zool. Rec. vi. p. 79) figured. W. L. Buller, B. N. Zeal. part ii.

Keropia [sc. *Turnagra*] *crassirostris*. Notes on. T. H. Potts, J. L. S. Zool. xi. pp. 505–509.

Pomatorhinus obscurus, sp. n., from Mount Aboo. A. O. Hume, Str. F. i. p. 7.

Arrenga blighi, sp. n., from Ceylon. E. W. H. Holdsworth, P. Z. S. 1872, p. 444, pl. xix.

Monticola saxatilis figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. x., xi.

Petrocossyphus cyanus and *P. manillensis*. Notes on changes of plumage. R. B. Sharpe, P. Z. S. 1872, p. 496; *Id.* & H. E. Dresser, B. Eur. part x. The former figured: J. Gould, B. Gt. B. pt. xxii.

Cossypha gutturalis (Zool. Rec. vi. p. 102) figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xiv.

Sylviidæ.

Pinarochroa, gen. n. Type *Saxicola sordida*, Rüpp. C. J. Sundevall, Av. Tent. p. 4.

Penthodyta and *Thamnocichla*, nomm. generr. emendd., = *Pentholæa* and *Thamnolæa*. *Id. t. c.* pp. 4, 5.

Saxicola albiniger, sp. n., from hills of Sindh and Mekran coast. A. O. Hume, Str. F. i. p. 2.

Saxicola monacha figured. G. E. Shelley, B. Egypt, pl. ii.

Pratincola macrorhyncha, sp. n., from Cutch. F. Stoliczka, J. A. S. B. xli. p. 238.

Ruticilla titys. Orthography of its specific name. A. Newton, Ann. N. H. (4) x. p. 227.

Accentor jerdoni, sp. n., from Cashmir. W. E. Brooks, J. A. S. B. xli. p. 327.

Iuscinioopsis brevipennis, sp. n., J. Verreaux, N. Arch. Bull. vii. p. 65.

Calamoherpe palustris figured. J. Gould, B. Gt. B. pt. xxi.

Calamodyta melanopogon figured. G. E. Shelley, B. Egypt, pl. iii. fig. 1.

Sylvia locustella breeding near Breslau. H. Bau, J. f. O. 1872, p. 394.

Melizophilus striatus, sp. n., from the Punjab. W. E. Brooks, Ibis, 1872, pp. 180, 181.

Sylviella, nom. gener. emend., = *Sylvietta*, Lafr. C. J. Sundevall, Av. Tent. p. 8.

Curruca orphea figured. J. Gould, B. Gt. Br. pt. xxi.

Sylvia melanothorax, sp. n., from Palestine. H. B. Tristram, Ibis, 1872, p. 296.

Dumeticola cyanocarpa, sp. n., from Sikkim. A. Hume, *tom. cit.* p. 108. Much closer to *Brachypteryx* than to *Dumeticola*: W. E. Brooks, *t. c.* p. 469.

Dumeticola major, sp. n., from Cashmir. *Id.* J. A. S. B. xli. p. 77.

Orthotomus castaneiceps, sp. n., from Guimaras Island. Ld. Walden, Ann. N. H. (4) x. p. 252.

Burnesia lepida. Its breeding habits. A. Anderson, Ibis, 1872, pp. 237–239.

Cinura, nom. gener. emend., = *Cynura*, Boie, = *Ephthianura*, Gould. C. J. Sundevall, Av. Tent. p. 15.

Sphenœacus punctatus and *S. rufescens* (Zool. Rec. vi. p. 86) figured. W. L. Buller, B. N. Zeal. part ii.

Cistodyta, type *Drymophila scotoptera*, Sund., *Drymodyta*, type *Malurus tinniens*, Licht., *Spiloptila*, type *M. clamans*, Rüpp., genn. nn. C. J. Sundevall, Av. Tent. p. 6.—*Scotocerca*, type *Malurus inquietus*, Rüpp., *Chlorodyta*, type *Drymœca flavida*, Strickl., *Herpystera*, type *D. bairdi*, Cass., genn. nn. *Id. tom. cit.* p. 7.

Cisticola ruficeps, sp. n., from Luzon. J. Cabanis, J. f. O. 1872, p. 316.

C. grayii, sp. n., from Celebes. Ld. Walden, Ann. N. H. (4) ix. p. 400.

Drymoipus insignis, sp. n., from Mount Aboo and Raipoor. A. O. Hume, Str. F. i. p. 11.

Drymoipus rufescens, sp. n., from India. *Id.* Ibis, 1872, p. 111.

Prinia adamsi is a *Drymœca*; but the genera are not distinct. W. T. Blanford, Ibis, 1872, pp. 84–86.

Homeyer, E. F. von. Die sibirische Laubvögel. J. f. O. 1872, pp. 201–209. Notes on seven species of *Phylloscopus* from Siberia.

Phylloscopus pallidipes, sp. n., from Sikkim. W. T. Blanford, J. A. S. B. 1872, p. 162, pl. vii. fig. 1.

Reguloides subviridis, sp. n., from N.W. India. W. E. Brooks, *tom. cit.* pp. 148–150.

Phylloscopus tytleri, sp. n., from Cashmere and Simla: *Id. loc. cit.* xii. p. 79, Ibis, 1872, pp. 22, 23. Its breeding habits: *Id. t. c.* p. 30.

Reguloides superciliosus, *R. proregulus*, and *R. occipitalis*. Their breeding-habits: *Id. t. c.* pp. 24–30. Their eggs [*cf.* Zool. Rec. viii. p. 62]: H. E. Dresser, P. Z. S. 1872, pp. 24, 26.

Phyllopneuste brehmi from Turkey. *Id. loc. cit.*

Horornis erythrogenys, sp. n., from Darjeeling. A. Hume, Ibis, 1872, p. 108.

Horeites brunnescens, sp. n., from Darjeeling: *Id. tom. cit.* p. 109. Probably belongs to another genus: W. E. Brooks, *t. c.* p. 470.

Horeites pallidus, sp. n., from Cashmere. *Id.* J. A. S. B. xli. p. 78.
Gerygone simplex, sp. n., from Luzon. J. Cabanis, J. f. O. 1872, p. 316.

Motacillidæ.

Hume, A. O. The Wagtails of India. No. 1. Str. F. pp. 26–31.
Refers to *Motacilla dukhunensis*, *M. personata*, and others of the "pied" group.

Motacilla cashmiriensis, sp. n., from Cashmere. W. E. Brooks, J. A. S. B. xli. p. 82.
Budytes cinereicapilla figured. J. Gould, B. Gt. Br. pt. xxii.
Anthus rufigularis in Austria. P. B. Hanf, Verh. z.-b. Wien, xxii. p. 400.

Elwes, H. J. A revision of the genus *Henicurus*. Ibis, 1872, pp. 250–262, pl. ix.
Nine species recognized, and their synonymy and geographical distribution fully given. *H. frontalis* is figured.

Grallipes, nom. gener. emend.,=*Grallina*, Vieill. C. J. Sundevall, Av. Tent. p. 155 (1873).

Troglodytidæ.

Æpycnemia, nom. gener. emend.,=*Aipunemia*, Swains. (typo nullo), *Æpynemia*, Strickl., *Microura* (potius *Micrura*), Gould, *Pnoepyga* et *Oligura*, Hodgs. Type *Tesia albiventer*, Hodgs. C. J. Sundevall, Av. Tent. p. 10.
Troglodytes borealis, notes on. H. W. Feilden, Zool. s. s. p. 3222.
Troglodytes neglectus, sp. n., from Cashmir. W. E. Brooks, J. A. S. B. p. 328.

Certhiidæ.

Xenicus longipes and *X. gilviventris* (Zool. Rec. iv. p. 104) figured. W. L. Buller, B. N. Zeal. part ii.
Certhia hodgsoni, sp. n., from Cashmir. W. E. Brooks, J. A. S. B. xli. p. 74.

Sittidæ.

Sitta tephronota, sp. n., from Central Asia. R. B. Sharpe, Ann. N. H. (4) x. p. 450.
Sitta krueperi and *S. neumayeri* [sc. *syriaca*] figured. *Id.* & H. E. Dresser, B. Eur. pts. xiii., xiv.

Paridæ.

Parus cyanus, *P. lugubris*, *P. borealis*, *P. ledouxi*, *P. ater* and *P. britannicus* (Zool. Rec. viii. p. 63) figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. x., xi.
Pœcilia [lege *Pœcile*] *brevirostris*, sp. n., from Eastern Siberia. L. Taczanowski, J. f. O. 1872, p. 444.
Acredula tephronota (Zool. Rec. ii. p. 117), *A. irbii* (Zool. Rec. viii. p. 64), *A. rosea* [sc. *vagans*], and *A. caudata* figured. *Id. op. cit.* pt. xiv.
Yuhina diademata (Zool. Rec. viii. p. 64) figured. J. Gould, B. As. pt. xxiv.

Tanagridæ.

Nemosia rourii (Zool. Rec. vii. p. 55, errore "*rousii*") figured. J. f. O. 1872, tab. i.

Ploceidæ.

Munia brunneiceps, sp. n., from Macassar. Ld. Walden, Tr. Z. S. viii. p. 73, pl. 9. fig. 1.

Oxycerca (*Uroloncha*) *jagori*, sp. n., from Luzon. J. Cabanis, J. f. O. 1872, p. 317.

Dermophrys jagori, sp. n., from Luzon. *Id. tom. cit.* p. 316.

Fringillidæ.

Sclater, P. L. A Revision of the Species of the Fringilline Genus *Sycalis*. Ibis, 1872, pp. 39–48, pls. ii., iii.

Of the 20 species assigned to the genus in Gray's 'Hand-list,' the author has not seen 2, the remaining 18 are merged in 10, the diagnostic characters, synonymy, and distribution of which are given. One receives a new name.

Sycalis pelzelni, sp. n., from Brazil and La Plata, is *S. brasiliensis*, Pelz. Orn. Bras. p. 232 (*nec* Gm.). *Id. ut supra*, p. 42.

S. chrysops, *S. lutea*, and *S. aureiventris* (Zool. Rec. ii. p. 118) figured. *Id. ut supra*.

Passerculus princeps, sp. n., from Massachusetts, U. S. A. C. J. Maynard, Am. Nat. 1872, p. 637.

Zonotrichia albicollis near Brighton. [*Cf.* Zool. Rec. vi. p. 88.] G. D. Rowley, P. Z. S. 1872, p. 681.

Padda oryzivora in confinement. [*Cf.* Zool. Rec. vii. p. 55.] C. Stölker, J. f. O. 1872, pp. 19–23.

Fringillauda sordida (Zool. Rec. v. p. 91) is a good species. A. O. Hume, Stray F. pp. 41–43.

Passer ammodendri, "Severtzow" (Zool. Rec. viii. p. 65), figured. J. Gould, B. As. pt. xxiv.

Pyrgilauda davidiana (Zool. Rec. viii. p. 66) figured. J. Verreaux, N. Arch. Bull. pl. i. fig. 2.

Chrysomitris thibetana, sp. n., from Thibet. A. O. Hume, Ibis, 1872, p. 107. Possibly *C. spinus* ♀. W. E. Brooks, *t. c.* p. 469.

Agriospiza, gen. nov. Type *Fringilla flavirostris*, L. C. J. Sundevall, Av. Tent. p. 32.

Ægiothus brewsteri, sp. n., from Massachusetts. R. Ridgway, Am. Nat. 1872, pp. 433, 434.

Procarduelis mandellii, sp. n., from Darjeeling: A. O. Hume, Str. F. p. 14. [Is *P. rubescens*, Blanf. (Zool. Rec. viii. p. 65): W. T. Blanford, Ibis, 1873, p. 217.]

Propasser saturatus, sp. n., from Sikkim: W. T. Blanford, J. A. S. B. 1872, p. 168, pl. viii. [Probably is *Carpodacus edwardsi* (Zool. Rec. viii. p. 66): *Id.* Ibis, 1873, p. 218.]

Erythrospiza githaginea figured. G. E. Shelley, B. Egypt, pl. v.

Pyrrhula cineracea, sp. n., from Siberia, and *P. cassini* (Zool. Rec. vii. p. 89). J. Cabanis, J. f. O. 1872, pp. 315, 316.

Loxia curvirostra and *L. pityopsittacus* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pts. xiv., xv.

EMBERIZIDÆ.

Emberiza intermedia figured. G. E. Shelley, B. Egypt, pl. iii. fig. 2.

Emberiza hortulana, E. cæsia, E. cirlus figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. x.

Emberiza cia and *E. melanocephala* figured: *Iid. op. cit.* pt. xi. The latter again figured: J. Gould, B. Gt. Br. pt. xxi.

Plectrophanes lapponicus figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xv.

Pipilo leucopis, sp. n. (not described), from Florida. C. J. Maynard, B. Flor. pt. i., wrapper. Is *P. alleni* (Zool. Rec. viii. p. 66). E. Coues, Key N.-Am. B. p. 152.

Corydospiza, gen. nov. Type *Fringilla alaudina*, Kittl. C. J. Sundevall, Av. Tent. p. 33.

ALAUDIDÆ.

HUME, A. O. The Skylarks of India. Str. F. i. pp. 38–41.

All the Indian species of *Alauda* are referred to *A. arvensis* and *A. malabarica*. The latter includes *A. gulgula, A. malabarica (vera), A. triborhyncha* as subspecies, each with a separate habitat, as well as a fourth from the Central Provinces, to which no name is given. [*Cf.* Ibis, 1873, pp. 221, 222.]

Alauda guttata, sp. n., from Cashmere. W. E. Brooks, J. A. S. B. xli. p. 85.

Alauda arborea figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xiii.

Mirafra immaculata, sp. n., from the hill of Deobund, near Mussoorie. A. O. Hume, Str. F. i. p. 12. [Possibly *M. assamica*: W. Blanford, Ibis, 1873, p. 217.]

Spizocorys, gen. n. Type *Alauda conirostris*, Sund. C. J. Sundevall, Av. Tent. p. 54.

Toxocorys, gen. renom., = *Certhilauda*, Swains. *Id. tom. cit.* p. 155 (1873).

Melanocorypha calandra figured. J. Gould, B. Gt. Br. pt. xxi.

Otocorys elwesi (Zool. Rec. viii. p. 66) not distinct from *O. longirostris*. A. O. Hume, Str. F. i. pp. 36–38. [This view admitted: W. Blanford, Ibis, 1873, pp. 213, 214.]

STURNIDÆ.

Sturnus faroensis [lege *færoensis*], sp. n. (not described), from the Færoes. H. W. Feilden, B. Fær. (separate copies) p. 47.

Acridotheres cinereus figured. Ld. Walden, Tr. Z. S. viii. pl. 10. fig. 1.

Calornis. Synopsis of the species. *Id. tom. cit.* pp. 79–81.

Calornis neglecta and *C. crassirostris*, spp. nn., from Celebes and Lombock. *Id. t. c.* pp. 79, 80.

Creadion carunculatus figured. W. L. Buller, B. N. Zeal. pt. iii.

Heteralocha acutirostris figured: *Id. op. cit.* pt. i. Shown to belong to the *Sturnidæ*: A. H. Garrod, P. Z. S. 1872, pp. 643–647.

Lophopsarus, gen. renom., = *Fregilupus*, Less. C. J. Sundevall, Av. Tent. p. 40.

PARADISIIDÆ.

ELLIOT, D. G. Descriptions of two Genera of *Parasidiidæ*, with Remarks on some of the Species. Ibis, 1872, pp. 111–114.

Xanthomelus, Bonaparte, is recognized as a good genus, the type being *Oriolus aureus*, L. *Sericulus xanthogaster* (Zool. Rec. viii. p. 68) is referred to *Chlamydodera*, and *Ptilorhynchus inornatus* (*t. c.* p. 68) made the type of *Amblyornis*, gen. n.

CORVIDÆ.

Gazzola typica, notes on. Ld. Walden, Tr. Z. S. viii. pp. 74, 75.

Garrulus lidthi is from Japan. T. Salvadori, Atti R. Acc. Tor. vii. pp. 473–476.

Picicorvus columbianus. Its habits and synonymy. E. Coues, Ibis, 1872, pp. 52–59.

Gymnocitta cyanocephala. Complete history of. *Id. tom. cit.* pp. 152–158.

Glaucopis wilsoni and *G. cinerea* figured. W. L. Buller, B. N. Zeal. pt. iii.

COLUMBÆ.

COLUMBIDÆ.

Columba trocaz and *C. laurivora*. Their synonymy rectified. F. Godman, Ibis, 1872, pp. 215–217.

Columba bollii, sp. n., from the Canaries. *Id. tom. cit.* p. 217.

Nesopelia, gen. n. Type *Zenaida galapagoensis*, Gould. C. J. Sundevall, Av. Tent. p. 99 (1873).

Stigmatopelia, type *Columba senegalensis*, L., *Spilopelia*, type *C. chinensis*, L., and *Cosmopelia*, type *C. elegans*, Temm., genn. nn. *Id. op. cit.* p. 100 (1873).

Haplopelia, nom. gener. emend.,=*Aplopelia*, Bp. *Id. l. c.* (1873).

Opetioptila, gen. renom.,=*Aburria*, Bp. *Id. op. cit.* p. 118 (1873).

Engyptila, gen. renom.,=*Leptoptila*, Swains. (1837, nec *Leptoptilus*, Less. 1831). *Id. op. cit.* p. 156 (1873).

Carpophaga novæ-zelandiæ figured. W. L. Buller, B. N. Zeal. pt. iii.

Carpophaga brenchleyi and *Ptilopus solomonensis*, spp. nn., from the Solomon Isles. G. R. Gray, Ann. N. H. (4) v. p. 328.

Ianthœnas griseigularis, sp. n., from Guimaras Island, Philippines. Ld. Walden & E. L. Layard, Ibis, 1872, p. 104, pl. vi.

Phlegœnas canifrons and *P. yapensis* [qu. *uapensis*?], spp. nn., from the Pelew and Mackenzie Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, pp. 101 & 102.

Turtur sharpii (Zool. Rec. vii. p. 58) and *T. auritus* figured. G. E. Shelley, B. Egypt, pl. x.

DIDIDÆ.

OWEN, R. On the Dodo (Part II.). [See "ANATOMY AND PHYSIOLOGY."]

GALLINÆ.

Cracidæ.

Crax incommoda, sp. n. P. L. Sclater, P. Z. S. 1872, p. 690.

Phasianidæ.

Elliot, D. G. A Monograph of the *Phasianidæ*, or Family of Pheasants. 1872. Part VI. Imp. fol.

In this part, completing the work (Zool. Rec. vii. p. 59, viii. p. p. 69), is contained an elaborate Introduction, giving tables of the geographical distribution of the family, as well as a full account of its bibliography and classification, illustrated by two plates showing generic characters. The birds figured are *Calophasis ellioti* (vide infrà), *Pucrasia darwini* (vide infrà), *Phasianus sæmmerringi*, var. *scintillans* (Zool. Rec. iii. p. 107), and a hybrid (between *Thaumalea picta* and *T. amherstiæ*).

Phasianus ellioti, sp. n., from Ningpo. R. Swinhoe, P. Z. S. 1872, p. 550.

Calophasis, gen. nov., type *P. ellioti*, ut suprà. D. G. Elliot, Monogr. Phas. pt. vi.

Argus ocellatus (Zool. Rec. viii. p. 70) is probably generically distinct; two of the feathers attributed to it are rectrices of *Pavo muticus*. T. W. Wood, Ann. N. H. (4) x. p. 67. [*Cf.* Ibis, 1873, p. 330.]

Polyplectrum intermedium, from the Looshai country, described from some tail-feathers. A. O. Hume, Str. F. i. pp. 35 & 36. [*Cf.* Ibis, 1873, p. 220.]

Murie, J. On the Cranial Appendages and Wattles of the Horned Tragopan. P. Z. S. 1872, pp. 730–736, pls. lx. & lxi.

The display of *Ceriornis satyra* during courtship is first described, and then the head-dress of the two sexes, followed by an account of the cranial dissection of a male in the pairing-season, specially describing the "pseudo-horns," and how they are erected, and the structure of the wattle. Finally, a summary of the chief facts established is given. The plates illustrating this paper, by M. Berjeau, call for especial remark.

Ceriornis blythi (Zool. Rec. viii. p. 59), from the Naga Hills: H. Godwin-Austen, P. Z. S. 1872, p. 496. Figured, with *Ithaginis geoffroyi* (Zool. Rec. iv. p. 115): J. Gould, B. As. pt. xxiv.

Pucrasia darwini, sp. n., from Ningpo: R. Swinhoe, P. Z. S. 1872, p. 552. Figured: D. G. Elliot, Monogr. Phas. pt. vi.

Meleagris superbus, sp. n., foss., E. D. Cope, Tr. Am. Phil. Soc. xiv. p. 239.

Meleagris altus, sp. n., foss. from the postpliocene of New Jersey. O. C. Marsh, P. Ac. Philad. 1870, p. 11, Am. Nat. iv. p. 317, Am. J. Sc. (3) iv. p. 260. Is *M. superbus*, Cope (*ut suprà*). Coues, Key N.-Am. B. p. 348.

Meleagris celer, sp. n., foss. from the same formation. *Id. tom. cit.* p. 261.

Meleagris antiquus, sp. n., foss. from the miocene of Colorado. *Id. op. cit.* ii. p. 126.

Numida vulturina is from Somali-land, and its occurrence in Zanzibar (Zool. Rec. iv. p. 115) is doubtful. J. Kirk, P. Z. S. 1872, p. 789.

Tetraonidæ.

Tetrao urogallus figured. J. Gould, B. Gt. Br. pt. xxi.

Tetrao tetrix and its hybrids, *T. urogallo-tetrix* (=*T. urogalloides*), and *Lagopus tetrici-albus* (=*T. lagopoides*) described. R. Collett, Forh. Vid. Selsk. Christ. 1872, pp. 48–66.

Francolinus vulgaris, its extirpation in Sicily. H. Saunders, Ibis, 1872 pp. 80 & 81.

Coturnix novæ-zelandiæ figured. W. L. Buller, B. N. Zeal. pt. iii.

Megapodiidæ.

Megapodius brenchleyi, sp. n., from the Solomon Is. G. R. Gray, Ann. N. H. (4) v. p. 328.

Megapodius huttoni (Zool. Rec. vii. p. 60) is *M. pritchardi*, Gray. F. W. Hutton, Tr. N. Z. Inst. iv. p. 165.

GRALLÆ.

Genus incertæ sedis.

Aletornis, gen. nov., foss.:—*A. nobilis*, *A. pernix*, *A. venustus*, *A. gracilis*, and *A.* (?) *bellus*, spp. nn., all from the eocene of Wyoming Territory. O. C. Marsh, Am. J. Sc. (3) iv. pp. 256–258.

Rallidæ.

Limnobænus, gen. nov. Type *Gallinula rubiginosa*, Temm. C. J. Sundevall, Av. Tent. p. 130 (1873).

Rallus modestus, sp. n., which "will doubtless form the type of a new genus," from the Chatham Islands: F. W. Hutton, Ibis, 1872, p. 247; Tr. N. Z. Inst. v. p. 223; H. H. Travers, *tom. cit.* p. 217. Said to be *R. dieffenbachi* juv.: W. L. Buller, B. N. Zeal. part iii.

Rallus pictus, sp. n., from New Zealand: T. H. Potts, Ibis, 1872, pp. 36–38. Its head, with that of *R. pectoralis*, figured. *Id.* Tr. N. Z. Inst. v. pl. xviii. Is *R. philippensis*: W. L. Buller, B. N. Zeal. part iii. Figured with *R. dieffenbachi*: *Id. op. cit.*

Ortygometra affinis and *O. tabuensis* figured. *Id. op. cit.* pt. iv.

Porzana bicolor, sp. n., from Darjeeling. Id. Walden, Ann. N. H. (4) ix. p. 47.

Gallinula phœnicura figured. J. Gould, B. As. pt. xxv.

Porphyrio melanonotus, var. *pelewensis*, from the Pelew Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, p. 107.

Porphyriola, nom. gener. emend., = *Porphyrula*, Blyth. C. J. Sundevall, Av. Tent. p. 131 (1873).

Notornis mantelli figured. W. L. Buller, B. N. Zeal. pt. iv.

Cnemiornis and *Aptornis*, notes on their remains: J. Haast, P. Z. S. 1872, p. 24. Their Ralline affinities confirmed: R. Owen, *loc. cit.*

Aptornis defossor (Zool. Rec. viii. p. 71). Its sternum and pelvis described, with attempted restoration of its skeleton. *Id.* Tr. Z. S. viii. pp. 119–126, pls. 14–16.

Ocydromus earlii and *O. sylvestris* figured. W. L. Buller, B. N. Zeal. pt. iii.

Ocydromus australis, its habits. W. T. L. Travers, Tr. N. Z. Inst. iv. p. 211.

Scolopacidæ.

Rhynchæa capensis figured. G. E. Shelley, B. Egypt, pl. xi.

Palæotringa (Zool. Rec. vii. p. 60) *vagans*, sp. n., foss. from the cretaceous greensand of New Jersey. O. C. Marsh, Am. J. Sc. (3) iii. p. 365.

Scolopax sabinii in Scotland. H. W. Feilden, Zool. s. s. p. 3188.

Gallinago heterœaca, sp. n., from Luzon, = *Scolopax* (*G.*) *heterura*, sp. n., Cab. (J. f. O. 1866, p. 28, *nec* Hodgs.). J. Cabanis, J. f. O. 1872, p. 317.

Tringa minutilla and *T. minuta* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xi.

Eurynorhynchus pygmæus figured. J. Gould, B. As. pt. xxiv.

Ancylochilus subarquata figured. *Id. tom. cit.*; and B. Gt. Br. pt. xxii.

Machetes pugnax (vest. autumn.) figured. *Id. op. cit.* pt. xxi.

Actiturus bartramius figured. *Id. op. cit.* pt. xxii.

Limosa lapponica and *L. ægocephala* figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xv.

Himantopus spicatus, sp. n., from New Zealand. T. H. Potts, Tr. N. Z. Inst. v. p. 198.

Charadriidæ.

Finsch, O. Remarks on the 'Synopsis of the Genus *Chettusia*,' &c., by J. A. Ogden [Zool. Rec. viii. p. 72]. P. Ac. Philad. 1872, p. 32.

Contains corrections of synonymy, and adds 8 species omitted by Mr. Ogden, whose *C. nivifrons* (Zool. Rec. *l. c.*) is *Limnetes crassirostris*.

Squatarola helvetica figured. J. Gould, B. Gt. Br. pt. xxi.

Charadrius asiaticus, Pall., and *C. damarensis*, Strickl. Their synonymy, as given by Mr. Harting (Zool. Rec. vii. p. 61), rectified. O. Finsch, Ibis, 1872, pp. 144–147.

Eudromias tenuirostris, sp. n., from Burma. A. O. Hume, Str. F. i. p. 17. [Is *Ægialitis hartingi* (Zool. Rec. vii. p. 61). W. T. Blanford, Ibis, 1873, p. 217.]

Ægialitis occidentalis (locality not stated) and *Æ. gracilis*, from Tehuantepec, spp. nn. J. Cabanis, J. f. O. 1872, p. 158.

Ægialitis peroni figured. Ld. Walden, Tr. Z. S. viii. pl. 10. fig. 2.

Thinornis novæ-zelandiæ figured. W. L. Buller, B. N. Zeal. pt. iv.

Otididæ.

Otis tetrax figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xiii.

Gruidæ.

Grus proavus, sp. n., foss. from the postpliocene of New Jersey. O. C. Marsh, Am. J. Sc. (3) iv. p. 261.

Grus pavonina in Scotland. R. Gray, Ibis, 1872, p. 201.

Ardeidæ.

Ardea sacra and *A. novæ-hollandiæ* figured. W. L. Buller, B. N. Zeal. pt. iv.

Botaurus lentiginosus figured. J. Gould, B. Gt. Br. pt. xxii.

TANTALIDÆ.

Ibis falcinellus figured. J. Gould, B. Gt. Br. pt. xxi.

CARIAMIDÆ.

Cariama cristata, deformity of: A. Günther, Ann. N. H. (4) x. p. 67. Referred to *Accipitres* (*Polyborinæ*): C. J. Sundevall, Av. Tent. p. 111; W. K. Parker, M. Micr. J. 1873, pp. 45 & 46.

ANSERES.

BURMEISTER, H. Synopsis of the *Lamellirostres* of the Argentine Republic. P. Z. S. 1872, pp. 364–370.

A list of 24 species, with remarks chiefly on their distribution.

PHŒNICOPTERIDÆ.

Lipocentrus, gen. renom.,=*Phœnicoparrus*, Bp. C. J. Sundevall, Av. Tent. p. 145 (1873).

Phœnicopterus rubidus (Zool. Rec. v. p. 107) is *P. minor* ♀. A. O. Hume, Str. F. i. pp. 31–35.

ANATIDÆ.

Brenthus, gen. renom.,=*Bernicla*, Steph. C. J. Sundevall, Av. Tent. p. 145 (1873).

Anser albatus. Two examples killed in Ireland. H. Saunders, P. Z. S. 1872, pp. 519–521.

Pseudocycnus, nom. gener. emend.,=*Coscoroba*, Reichenb. (1853), *Pseudolor*, Gray (1855). J. C. Sundevall, Av. Tent. p. 147 (1873).

Cygnus ferus in India: W. E. Brooks, P. A. S. B. 1872, p. 64. Figured with *C. olor*: J. Gould, B. Gr. Br. part xxi.

Dendrocygna eytoni in New Zealand. A. C. Purdie, Tr. N. Z. Inst. iv. p. 213.

Casarca variegata, *Anas superciliosa*, *Hymenolæmus malacorhynchus*: their habits. W. T. L. Travers, *tom. cit.* iv. pp. 207 & 208. The first and last figured, with *Spatula variegata* and *Fuligula novæ-zelandiæ*: W. L. Buller, B. N. Zeal. pt. iv.

Anas superciliosa, var. *pelewensis*, from the Pelew Islands. G. Hartlaub & O. Finsch, P. Z. S. 1872, p. 108.

Anas angustirostris figured: R. B. Sharpe & H. E. Dresser, B. Eur. pt. xiii. Breeding in Spain: *Id.* P. Z. S. 1872, p. 605.

Anas boschas and *Nyroca leucophthalma* figured: J. Gould, B. Gt. Br. pt. xxi. The latter figured: R. B. Sharpe & H. E. Dresser, B. Eur. pt. xiv.

Hyonetta, gen. renom.,=*Cairina*, Flem. C. J. Sundevall, Av. Tent. p. 146 (1873).

Somateria stelleri from Flaxman's Island. J. H. Gurney, Ibis, 1872, p. 330.

Melonetta [minime *Melanitta*, Boie, 1822 (*Melanetta*, Gray, rectius *Melanonetta*)], gen. renom., = *Harelda* [errore pro nom. Islandic. "Hávelli"], Leach. C. J. Sundevall, Av. Tent. p. 149 (1873).

Erismatura leucocephala figured. G. E. Shelley, B. Egypt, pl. xii.

Laridæ.

Larus marinus figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xv.

Larus smithsonianus, Coues, is *L. argentatus*. J. A. Allen, Mem. Bost. Soc. i. pp. 520–522.

Larus bulleri, sp. n., from New Zealand: T. H. Potts, Ibis, 1872, pp. 38 & 39. Figured, with *L. dominicanus*: W. L. Buller, B. N. Zeal. pt. iv.

Larus dominicanus. Notes on its flight. F. W. Hutton, Tr. N. Z. Inst. v. pp. 140–144.

Larus melanorhynchus (Zool. Rec. vi. p. 100). Its habits. W. T. L. Travers, *op. cit.* iv. p. 209.

Larus ichthyaetus figured. G. E. Shelley, B. Egypt, pl. xiii.

Larus melanocephalus in England. H. Saunders, Ibis, 1872, pp. 78 & 79.

Rhodostethia rossi and *Actochelidon cantiaca* figured. J. Gould, B. Gt. Br. pt. xxii.

Sterna anglica in Hampshire, A. von Hügel, Zool. s. s. p. 3149; in Cornwall, E. H. Rodd, *t. c.* p. 3188.

Sterna hirundo figured. R. B. Sharpe & H. E. Dresser, B. Eur. pt. xi.

Sterna leucopareia breeding in India. A. Anderson, Ibis, 1872, pp. 81–83.

Rhynchops flavirostris figured. G. E. Shelley, B. Egypt, pl. xiv.

Procellariidæ.

Calopetes, gen. renom., = *Daption*, Steph. C. J. Sundevall, Av. Tent. p. 142 (1873).

Puffinus. Notes on various species. G. Hartlaub & O. Finsch, P. Z. S. 1872, pp. 108–112.

Puffinus audubonii, sp. n., from the Atlantic (= *P. obscurus*, Audub. Syn. B. N. Am. p. 339). *Iid. tom. cit.* p. 111.

Puffinus amaurosoma and *P. opisthomelas* (Zool. Rec. i. p. 96) are *Procellaria tristis*, Forst. (= *P. grisea*, L.), and *P. gavia*, Forst. F. W. Hutton, Ibis, 1872, pp. 83 & 84.

Puffinus persicus, sp. n., from the Persian Seas. A. O. Hume, Str. Feath. i. p. 5. [Is probably *P. obscurus*, W. T. Blanford, Ibis, 1873, p. 215.]

Prion australis, sp. n., from New Zealand. T. H. Potts, Tr. N. Z. Inst. v. p. 200.

Halodroma berardi in the Chatham Islands. F. W. Hutton, *tom. cit.* p. 224.

Pelecanidæ.

Sula loxostyla from the miocene of North Carolina. E. D. Cope, Tr. Am. Phil. Soc. xiv. p. 236.

Graculavus, gen. nov., foss. from the upper cretaceous formation: *G. velox*, *G. pumilus*, *G. anceps*, spp. nn., foss. O. C. Marsh, Am. J. Sc. (3) iii. pp. 363–365.

Phalacrocorax graculus figured. J. Gould, B. Gt. Br. pt. xxii.

Phalacrocorax africanus (?) in the Chatham Islands and New Zealand. F. W. Hutton, Ibis, 1872, p. 249; Tr. N. Z. Inst. v. p. 224.

Colymbidæ.

Hesperornis regalis, gen. et sp. n., foss. from the upper cretaceous shale of Kansas. O. C. Marsh, Am. J. Sc. (3) iii. p. 360.

Spheniscidæ.

Coues, Elliott. Material for a Monograph of the *Spheniscidæ*. P. Ac. Philad. 1872, pp. 170–212.

Wants nothing but the plates, which are not yet given, to be a complete monograph. After a very minute bibliography (pp. 170–181) the author gives a sketch of the cranial characters of the three genera he recognizes—*Aptenodytes*, *Eudyptes*, and *Spheniscus* (pp. 181–189). Remarks on geographical distribution (pp. 189 & 190) and a synoptical table (p. 192) of the 12 species, not including *S. mendiculus* (Zool. Rec. viii. p. 75), are followed by the Determination of the species (pp. 192–212), whence it appears that *E. pachyrhyncha*, Gray, is the true *E. chrysocome* (Forst.), to which also *E. nigrivestis*, Gould, is united. *A. torquata*, Forst., *A. palpebrata*, Licht., and *S. humboldti*, Meyen, are referred to *S. demersus* (L.), of which *S. magellanicus* (Forst.) is a variety. *Dasyrhamphus herculis* (Zool. Rec. vii. p. 64) is *E. adeliæ* (H. & J.) juv., and *S. undinus*, Gould, is *S. minor* (Forst.).

Hyatt, Alpheus. Catalogue of the Ornithological Collection in the Museum of the Boston Society of Natural History. Part I. *Spheniscidæ*. 8vo, 17 pp. Boston [U. S. A.]: 1871.

The 9 species in the collection are referred to 4 genera. The osteological portion is by Dr. Coues. [*Cf.* Am. Nat. vi. p. 472.]

"*Palæudyptes antarcticus*, Huxley," gen. et sp. foss. nov., from the tertiary rocks of Nelson, New Zealand. J. Hector, Tr. N. Z. Inst. iv. pp. 341–346, pls. xvii. & xviii.

Alcidæ.

Catarrhactes (*cf.* Zool. Rec. vii. p. 63) (ex Mœhr. [!], = *Uria*, auctt. recc.) *affinis*, sp. n., foss., from the postpliocene of Maine, U. S. A. O. C. Marsh, Am. J. Sc. (3) iv. p. 259.

Alca impennis never probably occurred in Norway: R. Collett, Forh. Vid. Selsk. Christ. 1872, p. 120. Additional particulars of its destruction in the Færoes and Iceland: W. H. Feilden, Zool. s. s. pp. 3280–3285. Reported occurrence in Greenland of late years: I. J. Hayes, 'Land of Desolation' (1871), p. 291; J. H. Gurney, jun., Zool. s. s. p. 3064. In Labrador in 1870: R. Deane, Am. Nat. 1872, pp. 368 & 369.

STRUTHIONES.

Struthionidæ.

Struthio camelus. Notes on its anatomy. A. H. Garrod & F. Darwin, P. Z. S. 1872, pp. 356–363.

Casuariidæ.

Sclater, P. L. On Kaup's Cassowary (*Casuarius kaupi*), and on the other known species of the genus. P. Z. S. 1872, pp. 147–150, pl. ix.

Casuarius kaupi (Zool. Rec. i. p. 97), its distinctness (*op. cit.* viii. p. 76) from *C. uniappendiculatus* reaffirmed, and the former figured. P. L. Sclater, P. Z. S. 1872, pp. 147–150, pl. ix.

Casuarius bicarunculatus (Zool. Rec. iii. p. 116) figured. *Tom. cit.* pl. xxvi.

DINORNITHIDÆ.

Dinornis. Notes on: J. Haast, Tr. N. Z. Inst. iv. pp. 66–107; J. Hector, *t. c.* pp. 110–120; W. D. Murison, *t. c.* pp. 120–124; W. L. Williams, *t. c.* pp. 124–127, pl. viii.; T. B. Gillies, *t. c.* pp. 127 & 128. Structure of egg-shell and feathers: F. W. Hutton, *t. c.* pp. 166, 167, 172, 173, pl. ix.

OWEN, R. On *Dinornis*.—Part XVI. (See *Rallidæ—Aptornis.*)

Dromornis, gen. n., foss. from Queensland. R. Owen, P. Z. S. 1872, p. 682 (abstract). Type *Dinornis australis*, W. B. Clarke, Geol. Mag. vi. p. 383 (*cf.* Zool. Rec. vi. p. 103).

APTERYGIDÆ.

Apteryx haasti, sp. n., from Middle Island, N. Z. T. H. Potts, Ibis, 1872, pp. 35 & 36; Tr. N. Z. Inst. iv. p. 204, v. p. 195.

Apteryx — (sp.?). Note on a skeleton. T. Allis, J. L. S. (Zoology) xi. p. 523.

SAURURÆ?

GENUS INCERTÆ SEDIS.

Ichthyornis, gen. nov., foss., with biconcave vertebræ. *I. dispar*, sp. n., foss. from the cretaceous shale of Kansas. O. C. Marsh, Am. J. Sc. (3) iv. p. 344.

REPTILIA

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

THE GENERAL SUBJECT.

a. CLASSIFICATION.

SEGOND, L. A. Reptiles et Batraciens classés d'après leurs affinités par rapport à cinq types dont les caractères sont empruntés aux parties les moins modifiables du squelette. Journ. de l'Anat. Phys. 1872, pp. 645–660.

As this is merely the commencement of an apparently very extensive treatise to be continued in 1873, an account of it is deferred at present.

β. FAUNÆ.

FATIO, V. Faune des Vertébrés de la Suisse. Vol. III. Histoire naturelle des Reptiles et des Batraciens. Genève et Bâle: 1872. 8vo, pp. 603, with 5 plates.

We noticed the first volume of this careful monograph in Zool. Rec. vol. vi. p. 4. The present volume contains the descriptions of 1 Tortoise (*Cistudo europæa*), 5 Lizards, 8 Snakes (among which *Tropidonotus fallax*), 14 Frogs and Toads, and 7 Salamanders and Newts.

Sicily. In a sketch of the Vertebrate Fauna of Sicily, Prof. DODERLEIN enumerates the Reptiles and Batrachians of this island, and enters into a detailed comparison of its Reptilian Fauna with that of the neighbouring zoological provinces. Ann. Soc. Nat. Modena, vi. 1872, pp. 60.

Central Asia. "Notes on some Persian, Himalayan, and other Reptiles," by J. ANDERSON. P. Z. S. 1872, pp. 371–404.

China. In a report by the Abbé DAVID of his travels in Western China (Nouv. Arch. Mus. vii. 1872 [1871 on titlepage], Bull. pp. 75–100), several new Batrachians are mentioned; but as scarcely more than the names are given, they are not recognizable, and, therefore, will not be mentioned below.

India. Dr. Fayrer's 'Thanatophidia' [see below, p. 76].

Dr. Stoliczka contributes the following papers:—

1. An account of his visit to Kachh [Cutch], where he collected 18 species of Lizards, 8 of Snakes, and 4 Frogs. He gives a sketch of the general character of the herpetological fauna of this province, and appends notes to most of the species; the more remarkable will be mentioned subsequently. Proc. As. Soc. Beng. 1872, pp. 71–85.

2. "Notes on Reptiles collected by Surgeon F. Day in Sind," refer to 9 Lizards and 11 Snakes. *Ibid.* pp. 85–92.

3. "Observations on Indian Batrachia." *Ibid.* pp. 101–113.

4. "Notes on some new species of Reptilia and Amphibia collected by Dr. W. Waagen in North-western Panjab [Punjab]." *Ibid.* pp. 124–131. This collection contained 14 Lizards, 3 Snakes, and 3 Frogs.

5. "Note on a few Barmese [Burmese] species of Sauria [3], Ophidia [2], and Batrachia [3]." *Ibid.* pp. 143–147.

6. "Notes on various new or little-known Indian Lizards." J. A. S. B. 1872, pp. 86–135, pls. 2–5. The species will be referred to in the special part of this Record.

Descriptions of new species from the Madras Presidency have been published by Major Beddome in Madras Month. Med. Journ. 1870 & 1871.

Borneo. Dr. Günther has worked out the herpetological fauna of this island. P. Z. S. 1872, pp. 586–600, pls. 35–40. He enumerates 10 Chelonians, 3 Crocodiles, 41 Lizards, 78 Snakes, and 25 Amphibians, describing some new forms, which will be mentioned below.

Prof. Peters's paper on Reptiles from Sarawak [see Zool. Record, viii. p. 78] has also appeared in Ann. Mus. Genov. iii. pp. 27–45, illustrated with 5 plates.

Celebes. Prof. Peters enumerates 26 Reptiles, of which 7 are Frogs, from Gorontalo and the Togian Islands. Berl. MB. 1872, pp. 581–584.

Ceylon. Dr. Günther describes seven new species (2 Lizards and 5 Frogs) collected by Mr. G. H. K. Thwaites, A. & M. N. H. 1872, ix. pp. 85–88.

Madagascar. M. Grandidier has noticed 18 new species in Ann. Sc. Nat. xv. 1872.

Africa. Prof. B. du Bocage describes 7 new Lizards and 2 Snakes from the Portuguese Possessions. Jorn. Sc. Lisb. 1872.

Mexico. The first part of "Mission Scientifique au Mexique et dans l'Amérique Centrale. Recherches Zoologiques publiées sous la direction de M. Milne-Edwards. Etudes sur les Reptiles et les Batraciens par MM. A. Duméril et Bocourt" (Paris: 4to) appeared in 1870; but as it contained plates without text, and text without plates, we delayed noticing it, in the hope of seeing its continuation. No other part having appeared up to

the present, we now refer to it so far as the text goes (to p. 32). All the Mexican species in the Paris Museum are to be described and figured, or at least noticed.

Central America. Mr. E. D. Cope enumerates 10 Snakes from Darien, P. Ac. Philad. 1871, pp. 200–203; 33 Snakes, 8 Lizards, and 5 Frogs from Costa Rica, pp. 204–216; 6 Snakes, 3 Lizards, and 4 Frogs from Tehuantepec, p. 216.

Señ. Espada describes 4 new Batrachians from Panama and Ecuador. An. Soc. Esp. i. (1872), pp. 85–88.

Brazil. Prof. Peters enumerates 15 Batrachians from Caravellas. Berl. MB. 1872, pp. 768–773.

Polynesia. Several new species of Lizards are described by Dr. Günther in J. L. Brenchley's 'Jottings during the Cruise of H.M.S. Curaçoa among the South Sea Islands in 1865' (London: 1873, 8vo, pp. 487. Reptiles, pp. 395–407). Although this work is published in 1873, we include it here to avoid repetition, the diagnoses of the new species having appeared in A. & M. N. H. for 1872.

New Caledonia. M. A. Bavay describes 2 Chelonians, 20 Lizards, and 8 Snakes (Mém. Soc. L. Norm. xv. pp. 37). He says the specimens have been compared with those in the Paris Museum by M. Guichenot; but no part of the literature has been consulted; consequently the majority have received new names.

γ. Anatomical Publications.

Brandt, E. Ueber den Ductus caroticus des mississippischen Alligators. Bull. Pétersb. xvii. 1872, pp. 307–309.

Eimer, T. Untersuchungen über die Eier der Reptilien. Arch. mikr. Anat. viii. pp. 216–243, Taf. 11, 12, pp. 397–434, Taf. 18.

Humphry, G. M. Observations in Myology, including the myology of Cryptobranch, Lepidosiren, Dog-fish, *Ceratodus*, and *Pseudopus pallasii*, with the nerves of Cryptobranch and Lepidosiren, and the disposition of muscles in vertebrate animals. Cambridge and London: 1872. 8vo, pp. 192, with 9 plates. Reprinted from J. Anat. Phys. vi. excepting a chapter on *Uromastyx*.

Landolt, E. Beitrag zur Anatomie der Retina vom Frosch, Salamander, und Triton. Arch. mikr. Anat. vii. pp. 81–100, Taf. 9.

Leydig, F. Zur Kenntniss der Sinnesorgane der Schlangen. Arch. mikr. Anat. viii. pp. 317–357, Taf. 15, 16.

——. Die Zähne einheimischer Schlangen nach Bau und Entwicklung. *Ibid.* ix. pp. 1–35, Taf. 1.

Sanders, A. Notes on the myology of *Liolepis bellii*. P. Z. S. 1872, pp. 154–183, with woodcuts.

CHELONIA.

Tortoises, Terrapins, and Turtles drawn from life by J. de C. Sowerby and E. Lear. London, Paris, and Frankfort: 1872. 4to.

This is a series of coloured plates intended to illustrate Bell's 'Monograph of the Testudinata,' which work was discontinued many years ago, after the publication of a very limited portion. The work, as it appears now, contains 60 plates, representing 36 species. It is edited by Dr. J. E. Gray, who has added the names given by Bell as well as the modern nomenclature. We shall subsequently mention the species figured, so far as they are not contained in the previously published parts of Bell's monograph.

We may also mention here, for the benefit of those who are interested in the typical specimens of the species described by Bell, that a part of them is deposited at Oxford and another at Cambridge. A. & M. N. H. 1872, x. pp. 407, 461, 462.

Gray, J. E. Appendix to the Catalogue of Shield Reptiles in the collection of the British Museum. Part 1. Testudinata. London: 1872. 4to, pp. 28.

The chief object in preparing this Appendix has been to give an account of the specimens of Chelonians observed by the author since the publication of his 'Supplement' in 1870 [see Zool. Record, vii. p. 69], and to embody in a systematic manner various modifications in the arrangement of the groups which suggested themselves to him during the continuation of his study of craniological characters.

Testudo. Sowerby & Lear (Tortoises &c.) have figured *T. indica, marginata, græca,* and *sulcata.*

Testudo (Peltastes) forsteni described and figured by Gray from a Celebes specimen, P. Z. S. 1872, p. 615, pl. 43.

Manuria emys. Dr. Anderson states that *Testudo emys* is the female and *T. phayrii* the male of the same species, and, therefore, that the synonymy would stand as given in Günther's 'Reptiles of British India.' He figures the sterna and also a skull of *T. phayrii.* *Manuria* is considered to be not distinct from *Testudo.* P. Z. S. 1872, pp. 132–144.—This observation is not confirmed by the specimens described by other authors. Gray, A. & M. N. H. 1872, x. pp. 218 & 219.

Cuora amboinensis figured in Sowerby & Lear, Tortoises &c.

Cyclemys oldhami. Notes by Anderson, P. Z. S. 1872, p. 371.

Emys. Sowerby & Lear, Tortoises &c., contain figures of *E. guttata, geographica, scripta (serrata), rugosa,* and *ornata.*

Emys. Messrs. Duméril and Bocourt describe the following Mexican species (Miss. Sc. Mex.) :—*E. incisa*, sp. n., p. 11, pls. 1 & 2; *E. areolata* and *venusta*, p. 13; *E. grayi*, sp. n., p. 13, pl. 2. fig. 2; *E. pulcherrima*, p. 15, pl. 7. fig. 1; and *E. marmorata*, p. 16.

Emys flavipes (Gray) considered by Sclater to be identical with *Clemmys leprosa*, P. Z. S. 1872, p. 603.

Emys nigra (Hallow.) probably identical with *E. olivacea* (Gray). Gray, A. & M. N. H. 1872, x. p. 54.

Actinemys marmorata of Lord = *Chrysemys oregonensis* (Agass.) = *Emys belli* (Gray). Gray, P. Z. S. 1872, pp. 872–874.

Dermatemys mawii figured in Miss. Sc. Mex. p. 17, pl. 7. fig. 2.

In a note entitled "Synopsis of the species of the *Chelydrinæ*," Mr. E. D. Cope revises more particularly the species of his genus *Claudius*, Philad. Proc. 1872, pp. 22–29. He distinguishes four, viz. :—

1. *Claudius severus*, sp. n., Isthmus of Tehuantepec.
2. *Claudius pictus*, sp. n., = *Staurotypus salvini*, Bocourt (*nec* Gray), Miss. Sc. Mex. p. 22, pl. 5. fig. 3.
3. *Claudius megalocephalus*, Bocourt, 1868, = *C. angustatus*, Bocourt, 1870 (*nec* Cope), Miss. Sc. Mex. p. 20, pl. 4.
4. *Claudius angustatus*, Cope.

Chelydra serpentina and *C.* (*Emysaurus*) *rossignonii*, sp. n., figured by Bocourt in Miss. Sc. Mex. p. 18, pl. 5. figs. 1 & 2.

Cinosternum albogulare, sp. n., Duméril & Bocourt, *l. c.* p. 24, Costa Rica.

Spatulemys, g. n., Gray, A. & M. N. H. 1872, x. p. 463. Near *Hydraspis*. Thorax oblong, elongate, depressed, with a distinct elongate nuchal plate. First vertebral plate very broad; second, third, and fourth longer than broad; anterior marginal plates broad; the second and ninth largest, angular above. The sternum elongate, broad and rounded in front, deeply notched behind; gular plate large, marginal. Head broad, depressed, entirely covered with small polygonal shields; forehead convex, rhombic, with a broad flat crown between the very large temporal muscles; chin with two beards; mouth broad and rounded in front. The two outer hinder claws very small, rudimentary. Tail conical. Sternum in male (?) slightly concave, especially behind.—*Spatulemys lasalæ*, sp. n., from Corrientes.

Chelemys. "On the genus *Chelymys* and its Allies from Australia," by Dr. J. E. Gray, P. Z. S. 1872, pp. 504–514. We need not enter into the contents of this paper, as they have been already embodied in the author's 'Appendix' (see above, p. 64). The plates and woodcuts with which this paper is illustrated represent *Chelemys victoriæ*, pl. 27, and figs. 1 (skull) & 2 (sternum); *C. kreffti*, pl. 28; *Elseya latisternum*, pl. 29, and figs. 3 (skull) & 4 (sternum); *Elseya dentata*, fig. 5; *Elseya? intermedia* is described as new, p. 512, or Appendix Shield Rept. p. 23.

Pelomedusa subrufa is figured in Sowerby & Lear, Tortoises &c., under the name of *Hydraspis galeata*.

Trionyx. The genus *Potamochelys* of Gray ought to be erased, as the animal proves to be a *T. gangeticus*, and the skull belongs to *Emyda punctata*. Anderson, A. & M. N. H. 1872, x. p. 221; Gray, *ibid.* p. 338.

Trionyx. In "Notes on the Mud-Tortoises of India," Dr. Gray has revised all the Indian species, *l. c.* pp. 326–340, modifying the arrangement previously

proposed by him, and describing as new *T. leithii*, *T. sewarce*, *T. bellii*, and *T. gataghol*.

Trionyx gangeticus (young) figured in Sowerby & Lear, Tortoises &c.

Trionyx. Dr. Anderson states that the *Trionyx javanicus* of recent authors on Indian Reptiles (not of Schweigger) is the *T. gangeticus* of Cuvier, and that for the *T. gangeticus* of those authors the name of *T. hurum* (B. H.) ought to be retained. A. & M. N. H. 1872, ix. pp. 382 & 383.—Remarks on this paper by Dr. Gray, *ibid.* pp. 473–475.—Reply by Dr. Anderson, *ibid.* x. pp. 219–222.

Chelonia midas and *C. imbricata* figured in Sowerby & Lear, Tortoises &c.

Chelonia agassizii is described as a new species by Duméril & Bocourt, Miss. Sc. Mex. p. 26, pl. 6, Pacific coast of Central America.

Dermatochelys coriacea. Osteology described by P. Gervais, Nouv. Arch. Mus. viii. pp. 199–228, pls. 5–9.

CROCODILIA.

GRAY, J. E. Catalogue of Shield Reptiles in the collection of the British Museum.—Part 2. Emydosaurians, Rhynchocephalia, and Amphisbænians. London: 1872. 4to, pp. 41.

Contains descriptions and synonymy of all the species known. The groundwork of this catalogue is contained in the two memoirs of which we have given a detailed report in Zool. Rec. ii. p. 149, and iv. p. 132, but it is supplemented by more recent additions to the literature.

Crocodilus. MM. Duméril & Bocourt give a synopsis of the species inhabiting tropical America, Miss. Sc. Mex. p. 30, and figure the skulls on pls. 8 & 9. *Crocodilus pacificus*, sp. n., p. 31, pl. 9. fig. 5, from Guatemala.

Crocodilus niloticus found in Sicily. Doderlein, Ann. Soc. Nat. Modena, vi. 1872, p. 23.—On its occurrence in Palestine, Dr. Mottenheimer, in Zool. Gart. 1872, pp. 237 & 238.

Crocodilus madagascariensis is described as a new species by Grandidier, Ann. Sc. Nat. xv. 1872.

Alligator lucius. On the ductus caroticus, E. Brandt, Bull. Ac. Sc. St. Pétersb. xvii. 1872, pp. 307–309, with woodcut.

LACERTILIA.

AMPHISBÆNIDÆ.

Dr. GRAY's 'Catalogue of Amphisbænians' has been noticed above ["CROCODILIA"].

MONITORIDÆ.

Hydrosaurus nuchalis, sp. n., from Negros, and *H. cumingi* (Martin), from Mindanao, described and figured by Günther, P. Z. S. 1872, Feb., p. 145, pls. 7 & 8.—*Hydrosaurus togianus*, sp. n., Peters, Berl. MB. 1872, July, p. 582, Togian Isl.

TEJIDÆ.

Ameiva vittipunctata, sp. n., Cope, Proc. Ac. N. Sc. Philad. 1871, p. 220, San Domingo.—*A. erythrops*, sp. n., Cope, *l. c.* p. 221, St. Eustatius.

LACERTIDÆ.

Lacerta strigata (Eichw.) described by Anderson, P. Z. S. 1872, p. 372.

Acanthodactylus cantoris. Notes by Stoliczka, J. A. S. B. 1872, p. 91.

Eremias. Dr. Günther describes the following new species in A. & M. N. H. 1872, ix. p. 381:—*E. nitida* from West Africa, *E. spekii* from Central Africa, and *E. fordii* from the Cape of Good Hope; and, *ibid.* x. p. 419, *E. brenchleyi* from Mongolia and *E. multiocellata* from the desert Gobi.—*E. brenchleyi* is also figured in Brenchley's 'Cruise of the Curaçoa,' p. 396, pl. 22. f. A, and *E. multiocellata* described, p. 400.

Eremias cæruleo-ocellata (D. & B.) described by Anderson, P. Z. S. 1872, p. 373.

Eremias (*Mesalina*) *watsonana*, sp. n., Stoliczka, P. A. S. B. 1872, pp. 86 & 125, Punjab.

Ophiops elegans (Ménétr.) described by Anderson, P. Z. S. 1872, p. 374.

Ophiops jerdoni. Notes by Stoliczka, J. A. S. B. 1872, p. 89.

Ophiops (*Pseudophiops*) *beddomii* (Jerdon) = *Pseudophiops monticola* (sp. n.), Beddome, Madras Month. Med. Journ. 1870, Wynaad.

ZONURIDÆ.

Gerrhosaurus æneus is described as a new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

Tachydromus. Dr. Stoliczka states that the number of chin-shields and nguinal pores sometimes varies within the limits of one species, therefore that *T. meridionalis* may prove to be a form of *T. sexlineatus*, and that *T. haughtonianus* (Jerd.) must range with *T. septentrionalis.* J. A. S. B. 1872, p. 87.

Gerrhonotus moreletii, *fulvus*, *lemniscatus*, and *vasconcelosii*, spp. nn., Bocourt, Nouv. Arch. Mus. Bull. 1872, pp. 102, 104, 105, and 107, from Central America.

CHALCIDIDÆ.

Chalcides trilineatus, sp. n., Peters, Berl. MB. 1872, p. 775, South America.

GYMNOPHTHALMIDÆ.

Belepharosteres, g. n., Stoliczka, Proc. As. Soc. Beng. 1872, p. 74. Body slender, scales smooth; head-shields as regular as in *Mocoa*; no external ear; feet short, five-toed. *B. grayanus*, sp. n., Stoliczka, *l. c.*, Cutch.—*B. agilis*, sp. n., Stoliczka, *l. c.* p. 126, N.W. Punjab.

Gymnops microlepis (Blanf.) very common in Cutch. Stoliczka, P. A. S. B. 1872, pp. 74, 124; and J. A. S. B. 1872, p. 90.

Gymnops meizolepis, sp. n., *id.* P. A. S. B. 1872, p. 124, North-west Punjab.

SCINCIDÆ.

Gongylus ocellatus in Spain. Perez Arcas, An. Soc. Esp. i. p. 90.

Hinulia (*Eumeces*). Dr. Stoliczka has made remarks on *H. indica*, J. A. S. B. 1872, p. 122, *H. maculata*, p. 123, and *H. dussumieri*, p. 124.—The last also described by Major Beddome, Madr. M. M. J. 1870.

Lygosoma (*Hinulia*) *leucospilos*, sp. n., Peters, MB. Berl. 1872, p. 684, Luzon.

Lygosoma [?] *tricolor*, *L. arborum*, *L. austrocaledonica*, *L. deplanchii* and *L. gracilis* described as new species from New Caledonia. Bavay, Mém. Soc. L. Norm. xv. pp. 17, 19, 21, 23, and 24.

Hinulia tetragonurus, sp. n., Günther, A. & M. N. H. 1872, x. p. 420, and in Brenchley's 'Cruise of the Curaçoa,' p. 405, pl. 24. fig. B, Feejee Islands.

Mocoa sikkimensis and *Eumeces himalayanus* distinct. Stoliczka, J. A. S. B. 1872, p. 126.

Mocoa sacra, sp. n., Stoliczka, *l. c.* p. 128, pl. 4. f. 4, Western Bengal.

Mocoa nitens (Ptrs.) figured in Ann. Mus. Genov. iii. Taf. 4. fig. 2.

Mocoa micropus, sp. n., Günther, A. & M. N. H. 1872, x. p. 420, and in Brenchley's 'Cruise of the Curaçoa,' p. 402, pl. 23, Feejee Islands.

Mocoa novaræ described by Günther, *l. c.* 2°. p. 403.

Hinulia variegata (Buller) = *Mocoa zelandica* (Gray). Hutton, Trans. N. Z. Inst. iv. 1872, p. 168.

Mocoa (?) *laxa* described as a new species from New Zealand by Hutton, *l. c.* p. 169.

Eumeces albofasciolatus, sp. n., Günther, A. & M. N. H. 1872, x. p. 370, North Australia.

Eumeces garnieri described as a new species from New Caledonia. Bavay, Mém. Soc. L. Norm. xv. p. 15.

Ristella. *Ateuchosaurus travancoricus* (sp. n., Beddome, Madr. M. M. J. 1870, p. 33) proves to be a species of this genus. Beddome, *l. c.* 1871; and Stoliczka, J. A. S. B. 1872, p. 129, pl. 4. fig. 5.

Cophoscincus quadrivittatus. Scales in 18–20 longitudinal rows. Peters, *l. c.* p. 583.

Nannoscincus, g. n., Günther, A. & M. N. H. Dec. 1872, x. p. 421. Differing from *Cophoscincus* (Ptrs.) by having keeled scales.—*N. fuscus*, sp. n., *l. c.*, and in Brenchley's 'Cruise of the Curaçoa,' p. 406, pl. 25, from the Feejees. —*Anotis*, described as a new genus by Bavay, Mém. Soc. L. Norm. xv. p. 29, is evidently the same: *A. mariei*, sp. n., from New Caledonia.

Mabuia parietalis (Ptrs.) figured in Ann. Mus. Genov. iii. Taf. 4. fig. 1.

Riopa anguina figured by Stoliczka, J. A. S. B. 1872, p. 130, pl. 5. fig. 4.

Riopa cyanella, sp. n., Stoliczka, *l. c.* fig. 3, Pegu.

Riopa albopunctata, *hardwickii*, and *punctata*. Their affinities considered by Stoliczka, *l. c.* p. 132.

Chiamela lineata discovered near Puna by Stoliczka, *l. c.* p. 135.

Anguis orientalis, sp. n., Anderson, P. Z. S. 1872, p. 376, fig. 1, Caspian Sea.

Norbea [?] *isolata*, sp. n., Hutton, Trans. N. Z. Inst. iv. 1872, p. 170, Bay of Plenty.

Amphixestus beccarii (Ptrs.) figured, Ann. Mus. Genov. iii. Taf. 4. fig. 3.

Cyclodus (*Omolepida*) *luctuosus* (Ptrs., 1866) is the type of a distinct genus, *Lissolepis*. Peters, Berl. MB. 1872, pp. 776.

Tropidolepisma striolatum. Note by Peters, Berl. MB. 1872, p. 775.

Tropidolepisma variabilis, described as a new species from New Caledonia. Bavay, Mém. Soc. L. Norm. xv. p. 26.

Tiliqua. Dr. Stoliczka has made remarks on *T. macularia*, J. A. S. B. 1872, p. 117, *T. trivittata*, p. 119, and *T. monticola*, p. 120.

Tiliqua macularia and *rufescens* are not specifically distinct. Beddome, Madr. M. M. J. 1870.

Tiliqua montícola. Note by Stoliczka, P. A. S. B. 1872, p. 126.

Euprepes prævornatus (Ptrs.) figured in Ann. Mus. Genov. iii. Taf. 3. fig. 2, = *Apterygodon vittatum* (Edeling), Günther, P. Z. S. 1872, p. 589.

Euprepes haplorhinus, sp. n., Günther, A. & M. N. H. 1872, x. p. 419, and in Brenchley's 'Cruise of the Curaçoa,' p. 397, pl. 22. fig. B, Feejee Islands.

Euprepes. Prof. B. du Bocage gives a list of 15 species received by the Lisbon Museum from the west coast of Africa. The new species are:—*E. petersi, E. bayonii, E. punctulatus, E. affinis, E. gracilis,* and *E. angolensis.* Jorn. Sc. Lisb. 1872.

Euprepes sakalava is described as a new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

Sepidæ.

Gongylus splendidus and *G. mouroundavæ* are described as new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

Sphenocephalus tridactylus described by Stoliczka, Proc. As. Soc. Beng. 1872, p. 76, from Cutch.

Sepsophis punctatus, g. n. (Sepid.) et sp. n., Beddome, Madr. M. M. J. 1870, near Vizagapatam.

Acontiidæ.

Nessia thwaitesii, sp. n., Günther, A. & M. N. H. 1872, ix. p. 86, Ceylon.

Geckotidæ.

Hemidactylus. Stoliczka gives a complete list of the Indian species, J. A. S. B. 1872, pp. 93–102, describing as new *H. giganteus,* p. 99, pl. 2. fig. 2, Godavari; and *H. (Doryura) mandellianus,* p. 101, pl. 3. figs. 1, 2, Pankabari.

Hemidactylus coctæi. Note by Günther, A. & M. N. H. 1872, ix. p. 86.—*H. bengalensis* (Anders.) = *H. coctæi,* Stoliczka, *l. c.* p. 98.

Hemidactylus persicus, sp. n., Anderson, P. Z. S. 1872, p. 378, fig. 2.

Hemidactylus tolampyæ is described as a new species from Madagascar by Grandidier, Ann. Sc. Nat. 1872, xv.

Nycteridium himalayanum (Anders.) = *N. schneiderianum.* Stoliczka, J. A. S. B. 1872, p. 103.

Peripia meyeri (Blkr. 1859) = *P. cantoris* (Gthr. 1864). Günther, P. Z. S. 1872, p. 594.

Peripia cyclura, sp. n., Günther, A. & M. N. H. 1872, x. p. 422, and in Brenchley's 'Cruise of the Curaçoa,' p. 407, New Caledonia.—*Peripia peroni* = *Peropus mutilatus* (Wiegm.), *ibid.*

Pentadactylus dorsalis (Ptrs.) figured, Ann. Mus. Genov. iii. Taf. 2. fig. 2.

Gecko trachylæmus, sp. n., Peters, Berl. MB. 1872, p. 774, N. Australia.

Platydactylus chahoua, P. auriculatus, P. crepuscularis, and *P. vieillardi,* described as new species from New Caledonia. Bavay, Mém. Soc. L. Norm. xv. pp. 3, 6, 8, and 10.

Spathodactylus, g. n., Günther, P. Z. S. 1872, p. 594. Only the extremity of the penultimate joint of the toes is dilated, shovel-like, and provided below with two divergent series of a few transverse plates; the last joint is short, but free, and armed with a claw. The thumb and fifth toe are reduced to a mere clawless rudiment. Eyelids none. Skin uniformly granular. An an-

gular series of larger scales in the præanal region is continued on the thigh.—*S. mutilatus*, sp. n., from the East-Indian Archipelago, *ibid.* figs. 1 & 2.

Naultinus. Notes on the species by Hutton, Trans. N. Z. Inst. iv. 1872, pp. 170–172.

Eublepharis macularius (Blyth) redescribed by Anderson, P. Z. S. 1872, p. 379.

Cyrtodactylus yarkandensis, sp. n., Anderson, P. Z. S. 1872, p. 381, fig. 3.

Gymnodactylus frenatus. Colour of young noticed by Günther, A. & M. N. H. 1872, ix. p. 86.

Gymnodactylus kachhensis, sp. n., Stoliczka, P. A. S. B. 1872, p. 79, Cutch.—*G. lawderanus*, sp. n., Stoliczka, J. A. S. B. 1872, p. 105, pl. 2. fig. 4, Almorah.—*G. planiceps*, sp. n., Beddome, Madr. M. M. J. 1871, Nellicootah.

Gymnodactylus geckoides of Blyth & Theobald = *G. caspius* (Eichw.). Stoliczka, P. A. S. B. 1872, p. 80.

Gymnodactylus speciosus, *G. collegalensis*, *G. maculatus*, and *G. nebulosus* are described as new species from the Madras Presidency. Beddome, Madr. M. M. J. 1870.

Gymnodactylus consobrinus (Peters) figured by Peters in Ann. Mus. Genov. iii. Taf. 2. fig. 1.

Gymnodactylus multicarinatus, sp. n., Günther, A. & M. N. H. 1872, x. p. 421, and in Brenchley's 'Cruise of the Curaçoa,' p. 404, pl. 24. fig. A, New Hebrides and Friendly Islands.

Gymnodactylus candeloti described as a new species from New Caledonia. Bavay, Mém. Soc. L. Norm. xv. p. 13.

Iguanidæ.

Anolis insignis, sp. n., Cope, P. Ac. Philad. 1871, p. 213; *A. microtus*, sp. n., Cope, *l. c.* p. 214; *A. trochilus*, sp. n., Cope, *l. c.* p. 215: all from Costa Rica.

Agamidæ.

Draco cristatellus, sp. n., Günther, P. Z. S. 1872, p. 592, pl. 35. fig. A, Sarawak.—*Draco spilonotus* (misprinted *spilopterus* in the text), sp. n., Günther, *l. c.* fig. B, Manado.

Gonyocephalus doriæ (Ptrs.) figured in Ann. Mus. Genov. iii. Taf. 3. fig. 1.

Tiaris. Dr. Günther describes the following new species in P. Z. S. 1872:—*T. liogaster*, p. 592, pl. 36, from Sarawak; *T. miotympanum*, p. 592, pl. 37. fig. B, Labuan; *T. tuberculatus*, p. 593, pl. 38, East-Indian Archipelago; and states that *T. petersi* (Gthr.) (Zool. Rec. ii. p. 136) is *T. sophiæ* (Gray), p. 593.

Calotes ellioti. Note by Stoliczka, J. A. S. B. 1872, p. 113.

Calotes liocephalus, sp. n., Günther, A. & M. N. H. 1872, ix. p. 86, Ceylon.

Brachysaura ornata, Cutch specimens described. Stoliczka, P. A. S. B. 1872, p. 77.

Lophocalotes, g. n., Günther, *l. c.* p. 593, differs from *Calotes* in the structure of the crest, which is interrupted on the neck, and formed by distant spines on the back.—*L. interruptus*, sp. n., pl. 37. fig. A, East-Indian Archipelago.

Japalura variegata. Notes by Stoliczka, J. A. S. B. 1872, p. 106, with reference to its alleged identity with *J. microlepis* and *J. planidorsata.*

Charasia. Dr. Stoliczka believes that *Charasia*, *Oriocalotes*, and most pro-

bably also *Oriotiaris*, should form only one genus, to which *Acanthosaura* is very closely allied, if at all distinct. J. A. S. B. 1872, p. 109.

Charasia blanfordiana, sp. n., Blanford, J. A. S. B. 1872, p. 110, Central India.

Hypselurus macrolepis, sp. n., Peters, Berl. MB. 1872, p. 775, Solomon Islands.

Lophura celebensis, sp. n., Peters, *l. c.* p. 581 [regarded by the Recorder as not specifically distinct from *L. amboinensis*].

Stellio. Dr. Stoliczka gives a synopsis of the Indian species, and describes as new *S. dayanus*, J. A. S. B. 1872, p. 113, pl. 3. fig. 4, Hardwar.

Stellio agrorensis, sp. n., Stoliczka, P. A. S. B. 1872, p. 128, N.W. Punjab.

Stellio melanurus (Anders.) distinct from *S. dayanus* (Stol.). *Id. l. c.* p. 129.

Stellio persicus, sp. n., Anderson, P. Z. S. 1872, p. 382. fig. 4.

Trapelus megalonyx described by Stoliczka, P. A. S. B. 1872, p. 88.

Phrynocephalus. Dr. Anderson (P. Z. S. 1872) describes *P. olivieri*, p. 386, *P. caudivolvulus*, p. 387, *P. persicus*, p. 388, fig. 5, *P. maculatus*, sp. n., from Persia, p. 389, fig. 6, *P. forsythii*, sp. n., from Yarkand, p. 390, fig. 7.

Uromastyx spinipes. Notes on its muscles by Prof. Humphry, Observ. Myol. pp. 61–64.

Liolepis belli. On its myology, Sanders, P. Z. S. 1872, pp. 154–183.

Chamæleonidæ.

Chamæleo ceylonicus found in Cutch by Stoliczka, P. A. S. B. 1872, p. 81.

Chamæleo antimena, *C. labordi*, and *C. campani* are described as new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

Chamæleo anchietæ, sp. n., Bocage, Jorn. Sc. Lisb. 1872, with woodcut, Mossamedes.

OPHIDIA.

Jan, G., & Sordelli, F. Iconographie générale des Ophidiens. Paris. Plates. 4to.

We gave descriptions of this work in Zool. Record, i. p. 99, ii. p. 139, iii. p. 117, iv. p. 126, v. p. 114, and vi. p. 105. Further numbers of plates, viz. 34–37, were published in 1870, No. 38 in 1871, and Nos. 39–42 in 1872. No text is given.

Dr. Günther has published his seventh Account of New Species of Snakes in the Collection of the British Museum. The total number of species in that collection amounts now to 920, and that of the typical specimens to 366. Ann. & Mag. Nat. Hist. 1872, ix. pp. 13–37. [See Zool. Record, v. p. 121.]

Innocuous Snakes.

Typhlops barmanus, sp. n., Stoliczka, P. A. S. B. 1872, p. 144, Moulmein.

Onychocephalus arenarius is described as a new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

Melanophidium punctatum, sp. n., Beddome, Madr. M. M. J. 1871, Travancore.—*M. bilineatum*, sp. n., Beddome, *l. c.* 1870, Wynaad.

Silybura canarica, sp. n., Beddome, *l. c.* 1870.

Calamaria (*Typhlocalamus*, g. n.) *gracillima*, sp. n., Günther, P. Z. S. 1872, p. 594, pl. 39. fig. A, Sarawak.

Calamaria beccarii, sp. n., Peters, Ann. Mus. Genov. iii. p. 34, Sarawak. —*C. bitorques*, sp. n., Peters, Berl. MB. 1872, p. 585, Philippines.

Simotes subcarinatus, sp. n., Günther, P. Z. S. 1872, p. 595, pl. 39. fig. B, Sarawak.—*Simotes formosanus*, sp. n., Günther, A. & M. N. H. 1872, ix. p. 20.

Geophis latifrons. Varieties noticed by Günther, *l. c.* p. 15.

Geophis lineatus=*Rhabdosoma trivirgatum* (Jan) and =*R. punctovittatum* (Jan). Günther, *l. c.*

Geophis mœstus, sp. n., Günther, *l. c.*, Costa Rica.—*Colobognathus brachycephalus*, sp. n., Cope, Proc. Ac. Nat. Sc. Philad. 1871, p. 211, Costa Rica.

Catostoma chalybæum (Wagl.). Varieties noticed by Günther, *l. c.* p. 16.—To this species may belong *Colobognathus dolichocephalus*, described by Cope as a new species from Costa Rica, *l. c.* p. 211.

Stenognathus brevirostris, sp. n., Peters, Berl. MB. 1872, p. 586, Philippines.

Leptocalamus, g. n. Calamarid., Günther, A. & M. N. H. 1872, ix. p. 16. Body and tail slender, subcylindrical; head narrow, not distinct from neck. Two pairs of frontals, rostrals rounded. Nostrils small, between two nasals. Loreal united with præocular; two postoculars. Eyes small. Scales smooth, in 17 rows. Anal and subcaudals double. The posterior maxillary tooth (1–3) is large, trenchant, not grooved, separated from the others by a small interspace.—*L. torquatus*, sp. n., p. 17, pl. 3. fig. A, South America.

Opisthotropis, g. n. Calamarid., Günther, A. & M. N. H. 1872, ix. p. 16. Body and tail moderately slender, posteriorly somewhat compressed; head rather narrow, not distinct from neck. A pair of anterior frontals; a single postfrontal, which is very broad. Rostrals rounded. Nostrils between two nasals, directed upwards. One loreal; one ante-, two postoculars. Eyes small. Scales smooth anteriorly, with faint keels towards the middle of the body, and strongly keeled behind and on the tail, in 17 rows. Anal and subcaudals double. Maxillary teeth equal in length, densely set, none grooved.—*O. ater*, sp. n., pl. 3. fig. B, West Africa.

Microdromus, g. n. Calamarid., Günther, A. & M. N. H. ix. p. 17. Physiognomy and habit as in *Elapomorphus* and *Homalocranium*. Head small, depressed, not distinct from neck. Eyes rather small. Upper shields of the head normal. Loreal none, replaced by the conjunction of the nasal, posterior frontal, and præocular. Nasal simple. Scales smooth, with apical groove, in 15 rows. Anal and subcaudal double. The last maxillary tooth is the largest, separated from the others by an interspace, and smooth.—*M. virgatus*, sp. n., pl. 4. fig. B, Costa Rica.

Ablabes gracilis, sp. n., Günther, *l. c.* p. 18, pl. 3, fig. D, Costa Rica.

Ablabes longicaudus (Ptrs.) figured in Ann. Mus. Genov. iii. Taf. 5. fig. 1.

Ablabes melanocephalus (Gray)=*Enicognathus javanicus* (Blkr.). Günther, P. Z. S. 1872, p. 590.

Ablabes periops, sp. n., Günther, *l. c.* p. 595, fig. 3, Sarawak.

Contia pygœa, sp. n., Cope, Proc. Ac. Philad. 1871, p. 223, Florida.

Streptophorus maculatus (Ptrs.) considered to be a variety of *S. sebæ* by Günther, A. & M. N. H. 1872, ix. p. 18.

Cyclophis æstivus. Note on its habits by Cope, Am. J. Sc. 1872, p. 148.

Cyclophis persicus, sp. n., Anderson, P. Z. S. 1872, p. 392, fig. 8.

Cyclophis tricolor (Schleg.) = *Ablabes schlegeli* (Blkr.). Günther, P. Z. S. 1872, p. 590.

Rhadinæa serperaster, sp. n., Cope, Proc. Ac. Philad. 1871, p. 212, Costa Rica.

Liophis purpurans (D. & B.). Note by Günther, A. & M. N. H. 1872, ix. p. 19.

Coronella phocarum is described as a new species by Günther, P. Z. S. 1872, p. 836, Robben Island.

Coronella pœcilolæmus, sp. n., Günther, A. & M. N. H. 1872, ix. p. 19, Upper Amazons.

Tachymenis bitorquata, sp. n., Günther, *l. c.* p. 19, Peruvian Amazons.

Tachymenis piceivittis (Cope) = *T. tæniata* (Ptrs.). Günther, *l. c.* p. 20.

Hypsirhynchus ferox is probably from San Domingo. Cope, P. Ac. Philad. 1871, p. 218.

Euophrys modestus from Paraguay, not from China. Günther, A. & M. N. H. 1872, ix. p. 29.

Spilotes fasciatus (Ptrs.) described by Günther, *l. c.* p. 20.

Elaphis (*Allophis*, subg. n.) *nigricaudus*, sp. n., Peters, Berl. MB. 1872, p. 686, North Celebes.

Xenelaphis hexagonotus = *Dendrophis dumerili* (Blkr.) = *Ablabes polyhemizona* (Blkr.). Günther, P. Z. S. 1872, p. 590.

Zamenis persicus (Jan) = *Z. ladacensis* (Anderson, 1871). Anderson, P. Z. S. 1872, p. 393. [See Zool. Rec. iv. p. 140.]

Zamenis ventrimaculatus, var. C, Günther (Colubr. Snak. p. 106), is described by Dr. Anderson as *Gonyosoma dorsale*, sp. n., *l. c.* p. 395, fig. 9.

Zamenis ater, sp. n., Günther, A. & M. N. H. 1872, ix. p. 22, Algeria.

Zamenis spinalis (Ptrs.) is probably from China or Japan. Günther, *l. c.*

Zamenophis, g. n. Colubrin., Günther, A. & M. N. H. 1812, ix. p. 21. Body rather elongate, with angular abdomen; back flat. Tail of moderate length. Ventral shields 200 or more in number, obtusely keeled on the sides. Head flat; eyes of moderate size, with round pupil. Shields of the head normal, two præoculars. Scales smooth, in 17 series, without pores. Anal entire; subcaudals two-rowed. The last maxillary tooth or teeth larger than and separated by a very short interspace from the others.—*Z. australis*, sp. n., Cape York.

Dromicus ignitus, sp. n., Cope, P. Ac. Philad. 1871, p. 201, Isthmus of Darien.—*D. flavilatus*, sp. n., Cope, *l. c.* p. 222, Fort Macon, N. C.

Dromicus madagascariensis, sp. n., Günther, A. & M. N. H. 1872, ix. p. 22, pl. 5. fig. A.

Herpetodryas occipitalis (Gthr.). The adult is uniform greenish-olive. Günther, *l. c.* p. 23.

Herpetodryas tetratænia, sp. n., Günther, *l. c.* p. 23, Bogota.

Philodryas psammophideus, sp. n., Günther, *l. c.* p. 23, pl. 4. fig. A, Tucuman.

Diplotropis, g. n. Dryadin., Günther, A. & M. N. H. 1872, ix. p. 24. Body and tail slender. Trunk with about 150 ventral shields, which show only very faint lateral keels. Head somewhat elongate, rounded in front, flat above. Eyes rather large, with round pupil. Nostrils between two shields. Shields of the head regular; loreal present; one anterior and two

posterior oculars. Scales in fifteen series, on the anterior half of the back elongate, lanceolate, on the posterior rhombic, many with a single apical pore. They are smooth, with the exception of those forming the series next to the vertebral series; these are provided with a strong keel, the keels forming a pair of raised lines along the middle of the back. Anal bifid. The maxillary teeth become gradually stronger posteriorly; none are grooved. —*D. bilineata*, sp. n., pl. 6. fig. B, Costa Rica.

Hapsidophrys niger, sp. n., Günther, *l. c.* p. 25, Gaboon.

Gonyosoma margaritatum (Ptrs.) figured in Ann. Mus. Genov. iii. Taf. 5. fig. 3.

Tropidonotus. A direct comparison of the typical specimens by Prof. Peters has shown that

1. *T. maculatus* (Edeling, 1864) = *T. sundanensis* (Gthr. 1865) = *T. maculatus* (Ptrs. 1871, and Ann. Mus. Genov. iii. p. 36); and that

2. *T. sarawacensis*, Günth. Proc. Zool. Soc. 1872, p. 596, also Zool. Rec. vii. p. 84, is a distinct species, which the Recorder has erroneously confounded with the former.

Tropidonotus flaviceps (D. & B.) = *T. leucomelas* (Gthr.) = *Amphiesma lindmanni* (Blkr.) = *A. rufotorquatum* (Edeling). Günther, P. Z. S. 1872, p. 590.

Tropidonotus conspicillatus, sp. n., Günther, *l. c.* p. 596, fig. 4, Borneo.

Tropidonotus. The snake noticed by Studer, and said to be new to Switzerland (see Zool. Rec. vii. p. 74), is described by Fatio under the name of *Tropidonotus fallax*. Faune Suisse, iii. p. 153.

Tropidonotus tessellatus figured by Fatio, *l. c.* p. 165, pl. 1.

Tropidonotus ferox (Gthr.) is not the *T. mortuarius* of Daudin. Günther, A. & M. N. H. 1872, ix. p. 27.

Tretanorhinus nigroluteus (Cope) = *Helicops agassizi* (Jan). Günther, *l. c.* p. 27.

Camastes quincunciatus (Jan) figured by Jan and Sordelli, part 38, pl. 1. fig. 1.

Hydrops lubricus, sp. n., Cope, Proc. Ac. Philad. 1871, p. 217, Mexico.

Hydræthiops, g. n. Natric., Günther, A. & M. N. H. 1872, ix. p. 28. Body stout, cylindrical; form of the head as in *Homalopsis*. A single anterior and two posterior frontals. Nostrils on the upper surface of snout, narrow slits between two nasals. Scales keeled, short, in twenty-three series; anal and subcaudals divided. Loreal present. Maxillary teeth in an uninterrupted series, slightly increasing in length posteriorly, numerous and closely set, none grooved.—*H. melanogaster*, sp. n., pl. 3. fig. G, Gaboon.

Homalophis doriæ (Ptrs.) figured, Ann. Mus. Genov. Iii. Taf. 5. fig. 2.

Miralia alternans (Reuss) = *Raclitia indica* (Gray) = *Rhabdion borneensis* (Blkr.). Günther, P. Z. S. 1872, p. 590.

Psammophidæ. Messrs. Jan and Sordelli (*l. c.*) figure in part 34:—*Coelopeltis oxyrhynchus*, *C. insignitus*, *C. porrectus*, Jan [= *Rhamphiophis rostratus*, Ptrs.], and *C.* [?] *productus*, Jan, *Psammophis sibilans*, *P. irregularis*, and *P. crucifer*.

Psammophis leithi and *P. condanarus* compared by Stoliczka, P. A. S. B. 1872, p. 83.

Amphiophis, g. n. Psammophid., Bocage, Jorn. Sc. Lisb. 1872. Only 11 series of scales on the body.—*A. angolensis*, sp. n.

Dendrophis salomonis, sp. n., Günther, A. & M. N. H. 1872, ix. p. 25, Solomon Islands.—*D. terrificus*, sp. n., Peters, Berl. MB. 1872, p. 583.

Ahætulla diplotropis, sp. n., Günther, A. & M. N. H. 1872, ix. p. 25, pl. 6. fig. A, Tehuantepec.

Ahætulla modesta, sp. n., Günther, *l. c.* pl. 6. fig. C, Guatemala.

Ahætulla lagoensis, sp. n., Günther, *l. c.*, Lagos.—*Philothamnus ornatus*, sp. n., Bocage, Jorn. Sc. Lisb. 1872, West Africa.

Chrysopelea vicina, sp. n., Günther, A. & M. N. H. 1872, ix. p. 27, Misol.

Leptodira semiannulata, sp. n., Günther, *l. c.* p. 31, Loanda.

Leptodira rhombifera, sp. n., Günther, *l. c.* p. 32, Guatemala.

Dipsas. Beside some of the known species, Messrs. Jan and Sordelli have figured *D. bertholdi* (Jan) (scales in 15 rows; habitat unknown), part 38, pl. 5. f. 3.

Dipsas approximans, sp. n., Günther, A. & M. N. H. 1872, ix. p. 32, Upper Amazons.

Dipsadoboa. Species of this genus are figured by Jan and Sordelli (part 38) under the names of *Heterurus gaimardi* (Schleg.) from Madagascar, *Heterurus bicolor* (Jan) and *Heterurus arctifasciatus* (D. & B.), also from Madagascar. [Of these the second, at least, is previously described as *Dipsadoboa unicolor*.]

Galedon annularis of Jan and Sordelli, pt. 36, pl. 5. fig. 1 [appears to be a *Tropidodipsas*].

Leptognathus. Dr. Günther (A. & M. N. H. 1872, ix.) states that *L. oreas* (Cope) is = *L. mikanii*, p. 29, and describes the following new species:—*L. annulatus* from Costa Rica, p. 30, *L. copei* from Surinam, p. 30, and *L. dimidiatus* from Mexico, p. 31.

Leptognathus. Besides some of the known species of this genus, Messrs. Jan & Sordelli figure in part 37 *L. philippii* and *dumerili* from Mexico, and *L. incertus* from Cayenne.—They place in the same genus *Leptognathus vagus* (Jan), said to be from Hong Kong, pl. 6. fig. 2.

Oxyrhopus. The more common species are figured by Jan & Sordelli, *l. c.* part 35, and part 36, pl. 1. Associated with them is a small snake from South America, without grooved tooth, and named *Clælia anomala* (Jan), pl. 1. fig. 4.

Rhinosimus guerini (D. & B.) figured by Jan & Sordelli, *l. c.* part 34, pl. 4. f. 1.

Hologerrhum is figured by Jan & Sordelli under the name of *Cyclochorus maculatus*, pt. 36, pl. 6. f. 3.

Lycodon tessellatus, from Manilla, figured by Jan & Sordelli, pt. 36, pl. 4. f. 2.

Lycophidion semicinctum, *L. nigromaculatum*, and *L. guttatum* figured by Jan & Sordelli, part 36, pl. 3.

Heterolepis glaber (Jan) figured by Jan & Sordelli, pt. 36, pl. 6. f. 4.

Cercaspis travancoricus, sp. n., Beddome, Madras Month. Journ. Med. Sc. 1870.

Nothopsis, g. n., Cope, Proc. Ac. Nat. Sc. Philad. 1871, p. 201. Type of a

new family, *Nothopidæ*, allied to *Xenodermus*. Teeth on all the usual bones of the mouth, wanting on the premaxillary. Maxillary teeth of equal length, entire. Head flat, oval, moderately distinct; body and tail compressed. Urosteges in two rows, anal shield entire; gastrosteges narrow, angulate, the ends crossed by a longitudinal groove; pupils round. Head covered with small scales above, except a pair of internasals in contact with nasals and rostral; an isolated median frontal, and a pair of small oval occipitals, each also entirely surrounded by small scales. A single nasal pierced by the nostrils; loreals like other head-scales, orbits surrounded by scales, labials not pitted. One pair of geneials. Scales of body subequal, keeled, without apical pores.—*N. rugosus*, sp. n., pl. 17. Scales in 29 rows. Isthmus of Darien.

Venomous Snakes.

Fayrer, J. The Thanatophidia of India: being a description of the Venomous Snakes of the Indian Peninsula; with an account of the influence of their poison on life, and a series of experiments. London: 1872, fol. pp. 156, with 31 coloured plates.

This work is divided into five sections. In the first a descriptive account is given of the venomous snakes of India, which, as the author himself says, is compiled from the researches of other herpetologists, so that we may at once pass to section 2, which contains statistical returns of the deaths by snake-bite that have occurred in the Bengal Presidency. He shows that snakes cause a terrible destruction of human life; and therefore it is all the more to be regretted that he is obliged to leave the question of the treatment of snake-bite, discussed in the third section of the work, exactly as it was. In section 4 the circumstances of a number of snake-bites are narrated, and in section 5 a great number of experiments on the influence of snake-poison on animals described. Of the conclusions arrived at we would draw attention to the following:—1. After death from poisoning by a Colubrine snake the blood nearly always firmly coagulates on removal from the body; after death by Viperine poison it remains permanently fluid. 2. It has been noted that cats resist the influence of the poison almost as long as dogs three or four times their size. 3. The poisonous snakes are not affected by their own poison; a cobra may bite itself or another cobra with impunity. 4. Snake-poison is absorbed and fatal in its action if it be applied to a mucous or serous membrane, to the stomach, or the conjunctiva. 5. Bodies of animals poisoned by snakes are eaten with impunity by man and animals. 6. The blood of an animal killed by snake-poison is itself poisonous.

The species figured will be mentioned subsequently.

Naja tripudians figured in Fayrer's 'Thanatophidia,' pls. 1–6.
Ophiophagus elaps figured in Fayrer's 'Thanatophidia,' pls. 7 & 8.

Bungarus fasciatus figured in Fayrer's 'Thanatophidia,' pl. 9; and *B. cæruleus*, pl. 10.

Hemibungarus gemiannulis, sp. n., Peters, Berl. MB. 1872, p. 587, Philippines.

Callophis pentalineatus, sp. n., Beddome, Madr M. M. J. 1871, Travancore Hills.

Elaps. The species distinguished by Jan are figured by Messrs. Jan & Sordelli, *l. c.* part 42.

Elaps multifasciatus (Jan) described by Cope, Proc. Ac. N. Sc. Philad. 1871, p. 209.—Note by Günther, A. & M. N. H. 1872, ix. p. 36.

Pseudonaja affinis, sp. n., Günther, *l. c.* ix. p. 35, pl. 4. fig. C, Australia.

Diemenia schlegelii, sp. n., Günther, *l. c.* p. 35, Misol; compared with *D. muelleri*.

Cacophis modesta, sp. n., Günther, *l. c.* p. 35, pl. 3. fig. C, West Australia.

Rhinelaps, g. n. Elapid., Günther, A. & M. N. H. 1872, ix. p. 33. Body stout, cylindrical, covered with short polished scales in seventeen series; tail short. Head not distinct from the neck, with the snout flat and trenchant. Eye small, with round pupil, posterior frontal replacing the loreal, in contact with two labials: one anterior, two posterior oculars. Nasal subdivided by the nostril. Anal bifid; subcaudals two-rowed; the poison-tooth placed rather far backwards; no other teeth behind it.—*R. fasciolatus*, sp. n., p. 34, pl. 5. fig. B, West Australia.

Hydrophidæ. Messrs. Jan & Sordelli have figured, in parts 39, 40, and 41, the species which they have had an opportunity of examining; several are figured under new names [but their determinations will require a thorough reexamination].

Platurus. These snakes go on shore, Peters, Berl. MB. 1872, p. 859 [as already asserted by Günther, Rept. Br. Ind. p. 352].

Aipysurus duboisi and *A. chelonicephalus* described as new species from New Caledonia. Bavay, Mém. Soc. L. Norm. xv. pp. 33, 34.

Hydrophis. Dr. Fayrer figures, in his 'Thanatophidia,' several species under the following names:—*H. jerdonii*, pl. 20; *H. robusta*, pl. 21; *H. crassicollis*, pl. 22; *H. cyanocincta*, pl. 23; *H. stewartii* and *H. curta*, pl. 24; *H. nigra* and *H. nigrocincta*, pl. 25; *H. coronata*, pl. 26; *H. chloris*, pl. 27; and *H. stricticollis*, pl. 28.

Prof. Peters (Berl. MB. 1872) describes *Hydrophis fasciatus* of Schneider, p. 849, remarks on *H. cyanocinctus*, p. 852, *H. stricticollis*, p. 858, and *H. diadema*, p. 859, and describes as new *H. tenuicollis*, p. 854, Taf. 2. f. 1, *H. bituberculatus*, p. 855, Taf. 2. fig. 2, from Ceylon, and *H. godeffroyi*, p. 856, Taf. 1. fig. 3, from the Kingsmill Islands.

Hydrophis nigra and *H. stewartii*, spp. nn., Anderson, P. Z. S. 1872, p. 399, Indian coast.

Hydrophis brookii, sp. n., Günther, P. Z. S. 1872, p. 597, fig. 5, Sarawak.—*H. holdsworthii*, sp. n., *id.* A. N. H. 1872, ix. p. 33, Ceylon.—Note on *H. stricticollis*, *ibid.*

Hydrophis dayanus, sp. n., Stoliczka, P. A. S. B. 1872, p. 89, Kurrachee.—*H. curtus* described *ibid.* p. 91.

Enhydrina bengalensis figured in Fayrer's 'Thanatophidia,' pl. 18.

Atractaspis corpulentus (Hallow.) described by Günther, A. & M. N. H 1872, ix. p. 36, pl. 3. fig. F.—*A. micropholis*, sp. n., Günther, *l. c.* fig. E, Africa.

Mr. Cope gives a synopsis of the Crotaline species with undivided anal shields and no rattle, Proc. Ac. N. Sc. Philad. 1871, pp. 205–209. He divides them, beside *Ancistrodon*, into the following groups :—

a. Body compressed; tail prehensile.
  α. A series of horn-like scales above the eye ..... *Teleuraspis.*
  β. No horns ..... *Bothriechis.*
b. Body cylindric; tail straight.
  α. Nasal plate one ..... *Porthidium*, g. n.
  β. Nasal plates two ..... *Bothriopsis.*

The species are enumerated with their synonyms.

Crotalus. Prof. Shaler, in an article headed "The Rattlesnake and Natural Selection," observes that the sound of the Rattlesnake is the same as that of *Cicada ramosa*, and draws the inference that *Cicada*-eating birds are attracted by it. Amer. Natur. 1872, pp. 32–37.—On the same subject, J. G. Henderson, *ibid.* pp. 260–263, and F. W. Putnam, *ibid.* p. 693.

Trimeresurus. Dr. Fayrer figures in his 'Thanatophidia':—*T. carinatus*, pl. 13; *T. anamallensis* and *T. erythrurus*, pl. 14; *T. monticola* and *T. andersonii*, pl. 15; *T. strigatus*, pl. 16.

Atropophis (new name for *Atropos*) *borneensis*, sp. n., Peters, Ann. Mus. Genov. iii. p. 41, Sarawak.

Daboia russelli figured in Fayrer's 'Thanatophidia,' pl. 11.

Echis carinata figured in Fayrer's 'Thanatophidia,' pl. 12.

PSEUDOPHIDIA.

Cæcilia malabarica, sp. n., Beddome, Mad. M. M. J. 1870.

Epicrium carnosum, sp. n., Beddome, *l. c.*, Wynaad.

BATRACHIA.

Batrachia salientia.

Mons. S. Jourdain draws attention to the distinction of species with small and large larvæ. Their development is essentially different; for while the small larvæ change uninterruptedly into the perfect animal, the large ones cease to grow and to feed at a certain period, utilizing for their further development a stock of nutritive matter deposited in their tissues. Compt. Rend. 1872, May, pp. 1417–1418.

Prof. Peters has examined the typical specimens collected and described by Spix, and revised their nomenclature. Spix had made out that he had collected 53 species, of which not less than 51 were described by him as new. The result of Peters's examination is, that the species collected amount in reality to

31, and that Spix is the discoverer of 13 only. MB. Ak. Berl. 1872, pp. 196–227.

Dr. C. Koch describes the forms and metamorphoses of the Tailless Batrachians of the valley of the Lower Main and Lahn, Ber. Senck. Ges. 1872, pp. 122–183. He draws particular attention to certain varieties, some of which appear to be constant, whilst others are caused by hybridism.

Oxyglossus. Notes by Stoliczka, who cannot admit the generic distinction of *Phrynoglossus* (Ptrs.). P. A. S. B. 1872, p. 101.

Pyxicephalus madagascariensis is described as a new species by Grandidier, Ann. Sc. Nat. xv. 1872.

Pyxicephalus khasianus (Anders.) = *P. frithi* (Theobald). Stoliczka, P. A. S. B. 1872, p. 102.—*P. lividus* (Blyth) irrecognizable. *Id. ibid.*

Rana. Dr. Stoliczka (P. A. S. B. 1872, pp. 102 & 103) remarks on the following species, chiefly with regard to their geographical distribution :—*R. cyanophlyctis, R. tigrina, R. limnocharis* (of which *R. brevipalmata* (Ptrs.) is, perhaps, a local variety), *R. liebigi*, and *R. sikkimensis* = *R. gammii* (Anders.).

Rana vicina, sp. n., Stoliczka, *l. c.* p. 130, Western Himalayas.

Rana conspicillata described as a new species from Borneo by Günther, P. Z. S. 1872, p. 597, pl. 40. fig. A. [The Recorder agrees fully with the view expressed by Prof. Peters in a letter, that this frog is only *R. kuhli*; but it is very singular that in some specimens the web is much more emarginate than in the typical form, almost as much so as in *R. tigrina*. Such specimens do not differ in any other way, and are from the same locality (Matang).]

Rana temporaria and varieties described by Koch, Ber. Senck. Ges. 1872, pp. 135 *et seq.*; also by Fatio, Faune Suisse, iii. p. 321, who distinguishes from it *R. agilis* (Thomas), p. 333.

Rana oxyrhinus and varieties described by Koch, *l. c.* pp. 142–144; also by Fatio, Faune Suisse, iii. p. 344.

Rana esculenta and varieties described by Koch, *l. c.* pp. 145–151.

Rana palmipes (Spix). On its nomenclature, Peters, *l. c.* p. 205.

Ceratophrys cornuta (L.) = *C. megastoma* (Spix); *C. dorsata* (Pr. Max.) = *C. cornuta* (Gthr.); and *C. boiei* (Hensel, 1867) = *C. bigibbosa* (Ptrs.), sp. n. Peters, *l. c.* p. 204.

Cystignathus. On the nomenclature of the Brazilian species collected by Spix, see Peters, *l. c.* pp. 197 *et seqq.*

Oreobates quixensis, g. et sp. n. Cystignathid., Espada, An. Soc. Esp. i. p. 86, Ecuador.

Gomphobates marmoratus (Rnhrdt. & Lütk.) = *Bufo albifrons* (Spix), according to Peters, *l. c.* p. 223.

Gomphobates kroyeri (Hensel, *nec* R. & L.) = *Paludicola henselii*, sp. n., Peters, *l. c.* p. 223.

Leptobrachium gracile, sp. n., Günther, P. Z. S. 1872, p. 598, Borneo.

Alytes obstetricans fully described by Koch, Ber. Senck. Ges. 1872, pp. 155–162.

Pelobates fuscus and varieties described by Koch, *l. c.* pp. 151–155.

Hemisus obscurus is described as a new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

Atelopus spumarius, sp. n., Cope, P. Ac. Philad. 1871, p. 222, Ambyiacu River.

Rhinoderma darwini. Espada gives an interesting account of the male's functions during the metamorphosis of the young. An. Soc. Esp. i. pp. 139–151.

Diplopelma. Dr. Stoliczka (P. A. S. B. 1872) makes remarks on *D. berdmorii*=*Callula natatrix* (Cope), p. 109, and on *D. carnaticum*, p. 110.

Engystoma mexicanum (Ptrs.)=*Systoma ustum* (Cope), according to Cope, Proc. Ac. N. Sc. Philad. 1871, p. 216.

Engystomops, g. n., Espada, An. Soc. Esp. i. p. 86. An *Engystoma* with very small parotoids. *Engystomops petersi*, sp. n., *ibid.*, Ecuador.

Calophrynus. Dr. Stoliczka proposes the generic name *Berdmorea* for *Engystoma* (?) *interlineatum* (Blyth). P. A. S. B. 1872, p. 146. [See Zool. Rec. viii. p. 86.]

Bufo. On the nomenclature of the Brazilian species collected by Spix, see Peters, Berl. Monatsb. 1872, pp. 220 *et seqq.*

Bufo stentor, sp. n., Espada, An. Soc. Esp. i. p. 85. Head small, depressed, and pointed, without rugosities or protuberances; its skin flabby; skin rugose and granulated; tympanum scarcely perceptible in the adult; parotoids small, flattened, and lateral; gular sac very large, with two longitudinal apertures: greyish-brown marbled, throat black. Taboga Island, Panama.

Bufo calamita, viridis, and *cinereus*, with varieties described by Koch, *l. c.* pp. 166–179.

Bufo leptopus, sp. n., Günther, P. Z. S. 1872, p. 598, Borneo.—*B. kandianus*, sp. n., Günther, A. & M. N. H. 1872, ix. p. 87, Ceylon.

Bufo sikkimensis. Note by Stoliczka, P. A. S. B. 1872, p. 112.

Dyscophus is described as a new genus, the affinities of which are not expressed in the diagnosis, by Grandidier, Ann. Sc. Nat. xv. 1872.—*D. insularis*, Madagascar.

Hylorana. Dr. Stoliczka (P. A. S. B. 1872, pp. 104–106) makes remarks on the following species:—*H. macrodactyla* (extending into Burma), *H. erythræa*, ?*H. tytleri* (Theobald), *H. malabarica*, *H. monticola* (Anderson), and *H. pipiens* (Jerdon).

Hylorana jerboa, sp. n., Günther, P. Z. S. 1872, p. 599, pl. 40. fig. B, Borneo.

Limnodytes celebensis, sp. n., Peters, Berl. MB. 1872, p. 585.

Limnodytes luctuosus (Ptrs.) figured in Ann. Mus. Genov. iii. p. 43, Taf. 6. fig. 1.

Ixalus. Dr. Günther describes four new species from Ceylon, A. & M. N. H. 1872, ix., viz. *I. fimbriatus* and *I. adspersus* on p. 87, and *I. oxyrhynchus* and *I. pulchellus* on p. 88.

Ixalus cinerascens. Note by Stoliczka, P. A. S. B. 1872, p. 109.

Ixalus pictus (Ptrs.) figured in Ann. Mus. Genov. iii. Taf. 6. fig. 2.

Polypedates. Dr. Stoliczka (P. A. S. B. 1872, pp. 106–108) remarks on *P. maculatus* (probably=*P. biscutiger*, Ptrs.) and *P. marmoratus* (Blyth).

Polypedates. Ixalus guttatus belongs to this genus. Günther, P. Z. S. 1872, p. 600.

Polypedates signatus, sp. n., Günther, *l. c.* pl. 40. fig. C, Borneo.

Polypedates raniceps (Ptrs.) figured Ann. Mus. Genov. iii. Taf. 6. fig. 3.

Elosia nasus=*Hyla ranoides* (Spix)=*Hyla stercoracea* (Spix). Peters, Berl. MB. 1872, pp. 207 & 214.

Centrolene, g. n. Polypedatid., Espada, An. Soc. Esp. i. p. 87. Head nar-

row and depressed; tympanum visible; vomerine teeth; tongue notched posteriorly; fingers half-webbed.—*C. geckoideum*, sp. n., *id. t. c.* p. 88, Rio Napo and Ecuador.

Hylomantis, g. n. Hylin., Peters, *l. c.* p. 772. No parotoids, no webs; sacral apophyses dilated; teeth.—*H. aspera*, sp. n., fig. 2, Caravellas.

[*Rappia*] *Eucnemis antanosi* and *betsileo* are described as new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

Hylodes. *Rana binotata* (Spix)=*Hylodes rugulosus* (Ptrs.). Peters, Berlin. Monatsb. 1872, p. 206.

Rana miliaris (Spix)=*Ololygon abbreviatus* (Steind.)=*Hylodes abbreviatus* (Hensel). Peters, *l. c.* p. 205.

Strabomantis. *Limnophys* (Zool. Rec. vii. p. 77) proves to be this genus, and *L. napæus*=*S. biporcatus* (Ptrs.). Espada, Ann. Soc. Esp. i. p. 85.

Amphodus, g. n. Hylodid., Peters, Berl. MB. 1872, p. 768. Teeth in the upper as well as lower jaw, and on the sphenoid. *A. wuchereri*, sp. n., p. 769, fig. 1, Caravellas.—This may be *Hyla luteola*, Pr. Max., but not Burm.

Hyla. On the nomenclature of the Brazilian species collected by Spix, see Peters, Berlin. Monatsb. 1872, pp. 207 *et seqq.*, 680.

Hyla marmorata (Burm., *nec* Laur.)=*H. vermiculata*, sp. n. Peters, *l. c.* p. 211.

Hylella punctatissima (Rnhrdt. & Ltk.) and *Cophomantis punctillata* (P 1870) are probably specifically identical, and, at all events, true *Hylæ*. Peters, *l. c.* p. 211.

Hyla pulchella (D. & B.)=*H. prasina* (Burm.), Peters, *l. c.* p. 680; *Hyla rubicundula* (Gthr.)=*H. striata*, sp. n., Peters, *ibid.* p. 681; *Hyla leucotænia* (Gthr., *nec* Burm.) ?=*H. bracteator* (Hensel), *ibid.*; *Hyla mesophæa* (Hensel) =*H. leucophyllata* (Burm., *nec* Beir.), *ibid.* p. 772.

Hyla corticalis and *H. aurantiaca*. Remarks by Peters, *l. c.* pp. 682, 683.

Hyla minuta and *H. microps*, spp. nn., Peters, *l. c.* pp. 680 & 682, Brazil.

Hyla rhodoporus=*H. punctata*, as previously stated by Peters. Günther, P. Z. S. 1872, pp. 662 & 663.

Hyla vasta, sp. n., Cope, P. Ac. Philad. 1871, p. 219, San Domingo.

Phyllomedusa palliata is described as a new species from Ucayale by Peters, *l. c.* p. 773.

Callula variegata, sp. n., Stoliczka, P. A. S. B. 1872, p. 111, Ellore.

Callula guttulata is the type of a new genus, *Caluella*. Stoliczka, *l. c.* p. 146.

Hylaplesia tinctoria. The figure of the so-called *Phyllobates chocoensis* [see Zool. Rec. viii. p. 87] is reproduced in Rev. et Mag. Zool. 1872, pl. 27.

Dendrobates trivittatus (Spix)=*D. obscurus* (D. & B.), according to Peters, Berl. Monatsb. 1872, p. 213.

Dendrobates madagascariensis and *D. betsileo* are described as new species from Madagascar by Grandidier, Ann. Sc. Nat. xv. 1872.

BATRACHIA GRADIENTIA.

Triton alpestris, *lobatus*, and *palmatus* described and figured by Fatio, Faune Suisse, iii. pp. 541 *et seqq.* pls. 3 & 4.

Axolotl. H. Gervais describes and figures a dropsical condition of the Axolotl. Journ. Zool. i. 1872, pp. 53–58, pl. 3.

Siredon dumerilii is noticed as the larva of a new Batrachian by A. Dugès, Ann. Sc. Nat. xv. 1872, p. 2, pl. 10, from Patzcuaro.

PISCES

BY

ALBERT GÜNTHER, M.A., M.D., PH.D., F.R.S.

THE GENERAL SUBJECT.

α. SEPARATE WORK.

BLEEKER, P. Atlas Ichthyologique des Indes Orientales Néerlandaises. See Zool. Rec. i. p. 134, ii. p. 163, vi. p. 123, vii. p. 82, viii. p. 89.

In the year 1872, livr. 25 & 26 have been issued, pp. 61–140 containing the remainder of the text to the *Scombresocidæ* and to a part of the *Clupeidæ*. The plates represent Scopeloid and Percoid fishes.

β. ANATOMICAL PUBLICATIONS.

BAMBEKE, C. VAN. Premiers effets de la fécondation sur les œufs des Poissons : sur l'origine et la signification du feuillet muqueux ou glandulaire chez les Poissons osseux. Compt. Rend. 1872, pp. 1056–1060.

DARESTE, —. Études sur les types ostéologiques des Poissons osseux. Compt. Rend. lxxv. pp. 1172–1175, 1253–1256.

GEGENBAUR, C. Untersuchungen zur vergleichenden Anatomie der Wirbelthiere.—Heft. III. Das Kopfskelett der Selachier, als Grundlage zur Beurtheilung der Genese des Kopfskeletts der Wirbelthiere. Leipzig : 1872, 4to (22 plates). [The cephalic skeleton of the Selachians as a basis for the study of the genesis of that of Vertebrates.]

GERBE, Z. Recherches sur la segmentation de la cicatricule et la formation des produits adventifs de l'œuf des Plagiostomes et particulièrement des Raies. Journ. de l'Anat. Phys.

1872, pp. 609–616, pls. 20–22; Compt. Rend. 1872, pp. 366–369.

Gulliver, G. On the size of the red corpuscles of the blood of the *Salmonidæ* and some other Vertebrates. P. Z. S. 1872, pp. 833–836.

Hertwig, R. Die lymphoiden Drüsen auf der Oberfläche des Störherzens. Arch. mikr. Anat. ix. pp. 62–79, Taf. 6. [The lymphoid glands on the surface of the heart of the Sturgeon.]

Hyrtl, J. Die Kopfarterien der Haifische. Denkschr. Ak. Wiss. Wien, xxxii. 1872, pp. 263–275, with 3 plates.

Oellacher, J. Beiträge zur Entwicklungsgeschichte der Knochenfische nach Beobachtungen am Bachforelleneie. Zeitschr. wiss. Zool. 1872, pp. 373–421, Taf. 32 & 33. [Contributions to the history of the development of osseous fishes from observations on Trout-ova.]

Parker, W. K. On the structure and development of the skull of the Salmon. Proc. Roy. Soc. 1872, pp. 360–362 (abstract).

Ranvier, L. Des étranglements annulaires et des segments interannulaires chez les Raies et les Torpilles. Compt. Rend. 1872, pp. 1129–1132.

γ. General Notes and Faunæ.

F. Poey, in his "Plantilla descriptiva ictiologica" (An. Soc. Esp. i. pp. 17–31) makes general remarks on the method followed in ichthyological descriptions.

Dr. v. Martens has published an article on some of the nest-building fishes. Zool. Gart. 1872, pp. 107–116.

Siberia. Mag. F. Schmidt's report on his expedition to the lower parts of the Jenissei has been noticed above (pp. 4, 5, 26). He enumerates (pp. 44–46) fifteen fishes, named after Pallas.

B. Dybowski has published diagnoses of 23 species from the River *Amur* and its tributaries, in Verh. z.-b. Ges. Wien, 1872, pp. 209–220. Most of these fishes are described as new, and will be mentioned below. We shall not add their characteristics, because they require reexamination, the author being confined beyond the limits in which he could have access to modern literature. More detailed descriptions, with figures, will be published by the Russian Geographical Society.

Italy. Prof. Canestrini has compiled the ichthyological part of the "Fauna d'Italia. Parte III. Pesce," which appears in

'L'Italia,' a work devoted to a complete account of the physical features, history, art, and statistics of Italy. It is published at Milan in 8vo, the ichthyological portion having been issued in the years 1871–72 (although no date is given on the covers), and comprising 208 pages. Prof. Canestrini has worked out his portion after the manner of a prodromus; that is, short diagnostic descriptions are given of the species enumerated, with their vernacular names, and occasional notes referring to their history.

Prof. P. Pavesi has published a separate pamphlet, entitled 'I Pesci e la pesca nel *Cantone Ticino*,' Lugano, 1871–73, 8vo, pp. 150, which seems to have originally appeared in the 'Agricoltore Ticinese' for the same years. The author describes in detail 23 species, some of which will be mentioned in the special part of this Record; and discusses, in separate chapters, the instruments and methods used in the canton for catching fishes, and the laws and regulations relating to fishing.

In the introductory part of his treatise the author notices another work on the fishes of this district, which has not been seen by the Recorder, and may be mentioned here, viz. M. Monti, 'Notizie dei pisce delle provincie di Como e Sondrio e del Cantone Ticino,' Como: 1864.

Dr. A. P. Ninni gives a list of twelve fishes which propagate in the lagunes of *Venice*; four species of Gobies and the Stickleback build nests. Atti Soc. Pad. i. 1872, pp. 92–96.

A general account of the fisheries of *Sardinia*, *Sicily*, *Taranto*, and *Naples*, with lists of fishes collected in those localities, is given by A. Targioni-Tozzetti, in his 'Relazione sulla pesca a S. E. il Ministro di Agricoltura,' Genova: 1872, 8vo, pp. 71. An account of the fishes of the Lake Fusaro, near Naples, by Costa, is added (pp. 61 & 62).

In a sketch of the Vertebrate Fauna of *Sicily*, Prof. Doderlein enumerates the fishes found in or round the island, about 390 in number. He states that this zoological district is characterized:—1, by a greater variety of species than is found in most other European districts; 2, by the recurring appearance of some rare species usually found in other parts of the Mediterranean or Atlantic [this has been observed also elsewhere]; and, 3, by the occurrence of individuals twice or thrice the normal size. Ann. Soc. Mod. vi. 1872, pp. 60.

Black Sea. A list of the fishes, amounting to 83 species, is contained in a work written in Russian by Basil Ulianin, and entitled 'Materials for a Fauna of the Black Sea' (Moscow: 1872, 4to, pp. 89–99); but not seen by the Recorder.

Turkestan. K. F. Kessler has published an "Ichthyological Fauna of Turkestan," in N. Mém. Mosc. 1872, x. pp. 32, with 7 plates. The memoir, unfortunately, is written in Russian, but we see that about 25 species (viz. 1 *Cottus*, 1 *Silurus*, 1 *Scaphi-*

rhynchus, and 22 Cyprinoids) are described therein. The names of these species will be mentioned below.

Africa. M. DE BRITO CAPELLO has concluded his list of the species from Madeira, the Azores, and Portuguese possessions in Africa, which are contained in the Lisbon Museum. Jorn. Sc. Lisb. 1872. [See Zool. Rec. viii. p. 92.]

India. "Notes on Fish collected by Dr. Stoliczka in Kachh [Cutch]," by F. DAY. J. A. S. B. 1872, pp. 258–260. 18 species.

Island of Misol. Dr. GÜNTHER gives a list of 85 species from this locality, in Brenchley's 'Cruise of the Curaçoa,' p. 410 [see above, p. 63].

Solomon Islands. Dr. GÜNTHER enumerates 68 species from this group. *Ibid.* p. 409.

South Australia. Besides some smaller additions to this fauna made by the Recorder, which do not require particular notice, two longer memoirs have appeared almost simultaneously. The first (which has the priority) is by KLUNZINGER, and published in Arch. f. Nat. 1872, pp. 17–47. The author enumerates 94 species, of which 20 are described as new; but he does not appear to have been acquainted with some of the papers referring to this fauna. The second is much more extensive, written by F. DE CASTELNAU, the author of the 'Nouv. Animaux de l'Amérique du Sud.' It appeared in Proc. Zool. Soc. Victor. 1872, pp. 29–247. One hundred and forty-eight species are described therein, sixty of which have been named by the author. The paper is entirely based on the Recorder's Catalogue; and we observe with pleasure that a great improvement of Count de Castelnau's descriptions has taken place when compared with those of his former publications. With regard to the distinction of the species we cannot enter here into their critical examination, but will only mention that the collections received from the same seas at the British Museum contain about 5 per cent. undescribed species, whilst Castelnau claims the finding of more than 30 per cent. We cannot help thinking that so great a difference is simply due to a different treatment of the matter. The introductory remarks of the author are chiefly directed against the Recorder's former treatment of ichthyological questions (that of the scientific nature of Count de Castelnau's works included), and will be read with pleasure by amateurs, and judged by zoologists.

New Zealand. The New-Zealand Geological-Survey Department has published a work on the 'Fishes of New Zealand,' Wellington: 1872, 8vo, pp. 133, with 12 plates. The descriptions have been drawn up by Capt. F. W. HUTTON, whilst Dr. HECTOR has worked out the more practical portion in additional "Notes on the Edible Fishes." The total number of the species described is 141, and many are represented by outline-figures.

The work, for which the colony is indebted, in the first place, to the indefatigable zeal of Dr. Hector, is very well executed. Capt. Hutton's descriptions are clear and precise, and will form a sound basis for the prosecution of this study in the different parts of the colony.

River Amazons. Prof. Cope has examined a collection from the Ambyiacu River, a tributary of the Amazons, near Pebas, in which he distinguishes 76 species, regarding 47 as new. Proc. Ac. N. Sc. Philad. 1871, pp. 250–291.

δ. Classification.

L. de Sanctis distinguishes five cerebral types in the class of Fishes (Panceri & De Sanctis, 'Sopra alcuni organi della Cephaloptera,' Napoli: 1869, 4to).

1. Hemispheres fused into one compact mass; olfactory lobes laterally coalesced with the hemispheres; optic lobes almost completely covered by the cerebellum; rhomboidal sinus entirely covered by the cerebellum, which is lobulate and lamellate. *Dicerobatis, Zygæna, Myliobatis, Trygon.*

2. Hemispheres open, and showing partially or completely the third ventricle; olfactory lobes laterally coalesced with the hemispheres; optic lobes and rhomboidal sinus not, or only partly, covered by the cerebellum; cerebellum smooth or furrowed. *All other Selachians and Ganoids.*

3. Hemispheres completely divided into two lateral masses; olfactory lobes transversely divided from the hemispheres; optic lobes left entirely uncovered by the cerebellum; rhomboidal sinus completely covered by the cerebellum, which is smooth. *Teleostei.*

4. Hemispheres separated by the presence of a special lobe of the third ventricle; olfactory lobes transversely divided from the hemispheres; optic lobes quadripartite, uncovered, and showing the Sylvian duct; sinus rhomboidalis completely uncovered; cerebellum rudimental, band-shaped. *Cyclostomi.*

5. *Branchiostoma.*

No. 247 of the Smithsonian Miscellaneous Collections contains an "Arrangement of the Families of Fishes, or Classes Pisces, Marsipobranchii, and Leptocardii," by Theodore Gill, M.D., Ph.D., Washington: 1872, 8vo, pp. xlvi & 49. In the introductory part the author discusses the points by which he is induced to recognize three classes instead of one, passing in review the various characters which may be used in the division of the class *Pisces* (down to the category of families), and the methods in which such characters have been used by authors. The genetic relations of the groups are also considered. The second part is a list of names of 244 families adopted by the author to serve as a basis for the arrangement of the collection of fishes in the Museum of the Smithsonian Institution. The following will indicate the arrangement adopted by Dr. Gill:—

I. Class PISCES.
A. Series TELEOSTOMI s. BRANCHIATA.
1. Subclass TELEOSTEI.
a. Order *Plectognathi.*
b. „ *Lophobranchii.*
c. „ *Pediculati.*
d. „ *Hemibranchii.*
e. „ *Teleocephali* (with the suborders Heterosomata, Anacanthini, Acanthopteri, Percesoces, Synentognathi, Haplomi, Isospondyli, Eventognathi, Gymnonoti).
f. „ *Scyphophori.*
g. „ *Nematognathi.*
h. „ *Apodes.*
i. „ *Opisthomi* (containing Mastacembelus and Notacanthus).
2. Subclass GANOIDEI.
α. Superorder *Hyoganoidei.*
a. Order *Cycloganoidei.*
b. „ *Rhomboganoidei.*
β. Superorder *Chondroganoidei.*
c. Order *Chondrostei.*
d. „ *Selachostomi.*
γ. Superorder *Brachioganoidei.*
e. Order *Crossopterygia.*
δ. Superorder *Dipnoi.*
f. Order *Sirenoidei.*
B. Series ELASMOBRANCHII.
II. Class MARSIPOBRANCHII.
III. Class LEPTOCARDII.

PALÆICHTHYES.

GANOIDEI.

A German translation of Dr. Lütken's paper on Ganoids [see Rec. vi. pp. 125, 138], by R. v. Willemoes-Suhm, has appeared in 'Palæontographica,' vol. xxii. There is appended to it a postscript by Dr. Lütken (also printed in Vid. Medd. 1872, pp. 79–84), in which he changes the position of *Dipnoi* to the Cycliferous *Crossopteri.*

Ceratodus. A condensed account of its organization by Dr. Günther, in Pop. Sc. Rev. 1872, pp. 257–266 (pl. 86, copied from Phil. Trans.). Of additional matter in this paper is to be noticed :—1. The parallelism of the geographical distribution of *Sirenidæ* and *Osteoglossidæ*; 2. A heterocercal and diphycercal condition of the pectoral fin of fishes is pointed out; and 3. The homology of the tooth-bearing pterygo-palatine arch of *Dipnoi* with the "upper jaw" of a shark is maintained.

Huso orientalis (Pall.) described by Dybowski, Verh. z.-b. Ges. Wien, 1872, p. 218.

Sturio schrenckii (Brdt.) described by Dybowski, *l. c.* p. 219.

Scaphirhynchus fedtschenkoi, sp. n., Kessler, N. Mém. Mosc. x. 1872, p. 26, tab. 12, Turkestan. [Translated, A. & M. N. H. Oct. 1873.]

PLAGIOSTOMATA.

Scyllium canicula breeds in captivity. Meyer, Zool. Gart. 1872, p. 371.

Raia dentata, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 46, S. Australia.

Torpedo. "Mémoire sur la Torpille," by Marey, in J. de l'Anat. Phys. 1872, pp. 468–499.

Torpedo fairchildi, sp. n., Hutton, Fish. of New Zealand, p. 83.

Dicerobatis giornæ. In a memoir entitled "Sopra alcuni organi della Cephaloptera giorna," and presented to the Accad. Pontaniana June 13, 1869 (Napoli: 1869, 4to, pp. 40, with two plates), Sigg. Panceri and De Sanctis describe and figure the præbranchial appendages, cranial retia mirabilia, and the brain of this fish.

Dicerobatis draco, sp. n., Günther, A. & M. N. H. 1872, x. p. 422, and in Brenchley's 'Cruise of the Curaçoa,' p. 412, pls. 26 & 27, Misol.

TELEOSTEI.

ACANTHOPTERYGII.

PERCIDÆ.

VAILLANT, L. Sur la distribution géographique des *Percina* (première section des Percoides). Compt. Rend. lxxv. pp. 1278–81.

Actenolepis ditmarii, g. et sp. n., Dybowski, Verh. z.-b. Ges. Wien, 1872, p. 210, Amur.

Psammoperca (1846) and *Cnidon* (1849) are identical; and *P. waigiensis* is probably the same as *C. chinensis*. Günther, A. & M. N. H. 1872, x. p. 426.

Lates similis, antarcticus and *victoriæ*, and *Microperca yarræ* are new names given by Castelnau to fishes observed at Melbourne. Proc. Zool. Soc. Victor. 1872, pp. 44–48.

Anthias rasor. Notes by Klunzinger, Arch. f. Nat. 1872, p. 17.—It is named *Cæsioperca rasor* by Castelnau, *l. c.* p. 49.

Anthias. A fish from New Zealand, described by Hutton, Fish. N. Zeal. p. 4, fig. 4, as *Scorpis hectori* (sp. n.), evidently belongs to this genus (division *Caprodon*) [and ought to be compared with *A. longimanus*].

Serranus. Plectropoma fasciatum (Lac.) is recognized as a Mediterranean species by Canestrini in Fauna d'Italia, Pesce, p. 77. [Is evidently a *Serranus.*]

Serranus cylindricus figured by Günther in Brenchley's 'Cruise of the Curaçoa,' p. 414, pl. 28. fig. A.

Plectropoma annulatum figured by Günther, *l. c.* p. 415, pl. 28. fig. B; and *Plectropoma ocellatum, ibid.* p. 416, pl. 29.

Ambassis urotænia. Notes by Klunzinger, *l. c.* p. 19.

Chilodipterus truncatus, sp. n., Günther in Brenchley's 'Cruise of the Curaçoa,' p. 418, pl. 30, Misol Island.

Apogon conspersus, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 18, Melbourne. Also Castelnau describes a new species from Melbourne, which he names *Apogon guentheri*, *l. c.* p. 46.

Vincentia waterhousii, g. et sp. n., Castelnau, *l. c.* p. 245, South Australia.

Lanioperca, g. n. Apogonin., Günther, A. & M. N. H. 1872, x. p. 183. Body compressed, rather elongate, covered with thin deciduous scales of moderate size. Head with the snout produced and pointed, entirely covered with small scales. Cleft of the mouth wide, with the lower jaw projecting. Jaws, vomer, and palatine bones with narrow bands of villiform teeth, and with an outer series of stronger teeth. A pair of very strong canine teeth in the upper jaw. Tongue smooth. Eyes of moderate size. Branchiostegals seven; pseudo-branchiæ. Two dorsal fins, the first composed of a few feeble spines; the soft dorsal and anal with rather numerous rays; the latter with two spines. No denticulations on the cranial bones, the opercular margins being very thin and membranaceous.—*L. mordax*, sp. n., from Tasmania.—The same fish is described as *Dinolestes muelleri* * (g. et sp. n.) by Klunzinger, Arch. f. Nat. 1872, p. 29, Taf. 3; and still later as *Neosphyræna multiradiata* (g. et sp. n.) by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 96. These two authors had their specimens from South Australia, and place the fish among the *Sphyrænidæ*.

Dules. Dr. Bleeker describes 3 species of this genus, which he refers to *Moronopsis* (Gill) = *Paradules* (Blkr.), Arch. Néerl. 1872, pp. 373–380:—

1. *Dules tæniurus* (C. & V.) = *Perca argentea* (Benn.).

2. *Dules marginatus* (C. & V.) = *Perca ciliata* (K. & v. H.) = *Dules maculatus* (C. & V.) = *Dules malo* (C. & V.), = *Dules leuciscus* (Jen.).

3. *Centropomus rupestris* (Lac.) = *Dules vanicolensis* and *guamensis* (C. & V.).

[The Recorder has arrived at a very similar result in 'Fische d. Südsee,' Heft 1, but arranges the synonymy in a somewhat different manner. This is only one of the numerous instances showing that in the 'Catalogue of Fishes' the reduction of the species has not been carried far enough.]

Dules auratus and *Dules christyi* are new names given by Castelnau to fishes from Victoria, *l. c.* pp. 55, 57.

Paradules (g. n.) *obscurus* and *Paradules lætus* are described as new species from South Australia by Klunzinger, *l. c.* pp. 20 & 21.

Pristipomatidæ.

Therapon niger, *Therapon richardsonii*, *Murrayia guentheri*, *Murrayia cyprinoides*, *Murrayia bramoides*, and *Riverina fluviatilis* are new names given Castelnau to fishes from Victoria. Proc. Zool. Soc. Victor. 1872, pp. 59–64.

Histiopterus labiosus is described as *Richardsonia insignis* (g. et sp. n.) by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 112.

Scolopsis xenochrous, sp. n., Günther, A. & M. N. H. 1872, x. p. 423, and in Brenchley's 'Cruise of the Curaçoa,' p. 420, pl. 31, Misol.

Symphorus, g. n., Günther, A. & M. N. H. 1872, ix. p. 438. Allied to *Dentex*, but with the præoperculum finely serrated. Form of the body oblong, compressed; eye moderate; cleft of the mouth of moderate width,

* This name has the priority.

rather oblique, with the jaws nearly equal. One continuous dorsal fin, with the numbers $\frac{10}{12+x}$; anal $\frac{3}{9}$. Caudal fin emarginate. Canine teeth in both jaws. Præorbital entire, broad, the distance between the eye and angle of the mouth being great; præoperculum finely serrated, with more than three series of scales. Seven branchiostegals. Scales of moderate size, ctenoid. Pseudobranchiæ well developed.—*Symphorus tæniolatus*, sp. n., p. 439, Macassar.

Sparidæ.

Crenidens zebra is named *Neotephræops zebra*, by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 68, and *Girellichthys zebra* by Klunzinger, Arch. f. Nat. 1872, p. 22.—Subsequently, Castelnau thinks that *Neotephræops* may be identical with *Melambaphes* (Gthr.), *l. c.* p. 248.

Haplodactylus mæandratus (Ellis). This name is given to a specimen from Hobson's Bay by Klunzinger, Arch. f. Nat. 1872, p. 22.

Calamus. Prof. Poey (Ann. Lyc. N. H. New York, x. 1872, pp. 170–184) distinguishes and describes the following Cuban species:—*C. bajonado* (Bl.), p. 176, pl. 6. f. 1; *C. megacephalus* (Swainson), p. 178; *C. orbitarius* (Poey), p. 179, pl. 6. f. 2; *C. macrops* (sp. n.), p. 181, pl. 7. f. 3; *Grammateus* (g. n.) *humilis* (Poey), p. 182; and *G. medius* (sp. n.), p. 183, pl. 7. f. 4.

Cirrhitidæ.

Chilodactylus allporti, sp. n., Günther, A. & M. N. H. 1872, x. p. 184, Tasmania.—*Chilodactylus asper* and *C. nebulosus*, spp. nn., Klunzinger, Arch. f. Nat. 1872, pp. 24, 26, South Australia.—*Chilodactylus spectabilis*, sp. n., Hutton, Fish. of New Zealand, p. 8.

Latris forsteri, *bilineata*, and *inornata* are new names given by Castelnau to fishes from Victoria. Proc. Zool. Soc. Victor. 1872, pp. 77–79.

Scorpænidæ.

Scorpæna ambigua, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 27, Hobson's Bay.

Aploactisoma schomburgki noticed as g. et sp. n., by Castelnau, Proc. Zool. Soc. Victor. p. 244, South Australia.

Sciænidæ.

Sciæna aquila. Antarctic specimens are named *Sc. antarctica* by Castlenau, Proc. Zool. Soc. Victor. 1872, p. 100.

Otolithus leuciscus, sp. n., Günther, A. & M. N. H. 1872, x. p. 398, Manilla.

Carangidæ.

Seriola grandis is described as a new species by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 115, Melbourne.

Neptonemus (?) *travale* is described as a new species by Castelnau, *l. c.* p. 119, Melbourne.

Cyttidæ.

Cyttus traversi, sp. n., Hutton, Fish. of New Zealand, p. 19.

Stromateidæ.

Centrolophus rotundicauda is described as a new species from Naples by A. Costa, Ann. Mus. Zool. Napol. vi. 1871, p. 84, tav. 1.

Nomeidæ.

Cubiceps pauciradiatus, sp. n., Günther, A. & M. N. H. 1872, x. p. 423, and in Brenchley's 'Cruise of the Curaçoa,' p. 420, Misol.

Scombridæ.

Scomber antarcticus is a new name given to a Mackerel obtained at Melbourne. Castelnau, Proc. Zool. Soc. Victor. 1872, p. 106.

Thynnus maccoyii is a new name given to a Tunny obtained at Melbourne. Castelnau, *l. c.* p. 104.

Cybium verany[i], sp. n., Doderlein, Giorn. Sc. Palerm. viii. 1872, pp. 1–12, c. fig., Sicily. On the same plate, fig. 1, *Cybium commersoni* is represented.

Trachinidæ.

Kathetostoma fluviatilis, sp. n., Hutton, Fish. of New Zealand, p. 24.

Percis alboguttata, sp. n., Günther, A. & M. N. H. 1872, x. p. 424, and in Brenchley's 'Cruise of the Curaçoa,' p. 422, pl. 32. fig. B, Misol.

Aphritis dumerili. To this species appears to belong *Pseudaphritis bassii*, g. et sp. n., Castelnau, Proc. Zool. Soc. Victor. 1872, p. 92.

Batrachidæ.

Batrachus grunniens. Note on the dentition of the palate, Günther, A. & M. N. H. 1872, ix. p. 439.

Pediculati.

Chironectes filamentosus is described as a new species from South Australia by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 244.

Oneirodes. Dr. Lütken's paper on this fish [see Zool. Record, viii. p. 90] has been translated in A. & M. N. H. 1872, ix. pp. 329–344, pl. 9.

Cottidæ.

Cottus grænlandicus. Individuals with white spots on the abdomen are males, those without females. Gill, Philad. Proc. 1872, p. 213.

Cottus spinulosus, sp. n., Kessler, N. Mém. Mosc. x. 1872, p. 3, figs. 1–2, Turkestan.

Platycephalus fasciatus, sp. n., Günther, A. & M. N. H. 1872, x. p. 397, Manila.

Platycephalus richardsonii and *P. proximus* are described as new species from Victoria by Castelnau, Proc. Zool. Soc. Victor. 1872, pp. 82, 85.—And *Platycephalus speculator* as one from Hobson Bay by Klunzinger, Arch. f. Nat. 1872, p. 28.

Neoplatycephalus grandis (g. n. et sp.), Castelnau, *l. c.* p. 87, Melbourne.

Lepidotrigla brachyoptera, sp. n., Hutton, Fish. of New Zealand, p. 27.

Gobiidæ.

Gobius avernensis appears to be a species described by Canestrini for the first time, in Fauna d'Italia. Pesce, p. 27. From the river Arno.

Gobius bassensis, *G. pictus*, and *G. pulchellus* are described as new species from South Australia by Castelnau, Proc. Zool. Soc. Victor. 1872, pp. 123, 124, 125.

Latrunculus. R. Collett shows that *Gobius stuwitzi* and *Gobius nilssoni* belong to this genus, the characters of which require modification. He distinguishes the species thus:—1. Five dorsal spines; teeth strong; second dorsal with the upper margin even: *L. albus*. 2. Five dorsal spines; teeth very small; second dorsal with the upper margin sloping: *E. stuwitzi*. 3. Two dorsal spines: *L. nilssoni*. Forh. Selsk. Chr. 1872, pp. 1–12.

Eleotris nudiceps is described as a new species by Castelnau, *l. c.* p. 126, Yarra River.

Heterolepidina.

Scombrocottus salmoneus, g. et sp. n., Peters, Berl. MB. 1872, p. 568, Vancouver's Island.—D. 18 | 18. A. 18. P. 1/16. [This genus appears to be very closely allied to *Anoplopoma* of Ayres.]

Blenniidæ.

Salarias holomelas, sp. n., Günther, A. & M. N. H. 1872, x. p. 390, Cebu.—*Salarias coronatus*, sp. n., Günther, *ibid.* p. 424, and in Brenchley's 'Cruise of the Curaçao,' p. 424, pl. 33. fig. B, Solomon Islands.

Clinus. *Stichærium rubrum* and *S. flavescens*, spp. nn., Hutton, Fish. of New Zealand, p. 33.

Clinus marmoratus is described as a new species by Klunzinger, Arch. f. Nat. 1872, p. 33, Port Philip, S. Australia.

Clinus veranyi is perhaps only a monstrosity of *Cristiceps argentatus*. Canestrini, Fauna d'Italia, Pesce, p. 185.

Cristiceps tristis is described as a new species by Klunzinger, *l. c.* p. 31; and *Cristiceps multifenestratus* and *C. forsteri* as new species by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 131; all from South Australia.—*Cristiceps splendens* is another new species from South Australia, described by Castlenau, *l. c.* p. 244.

Ophiclinus antarcticus, g. et sp. n., Castelnau, *l. c.* p. 246, South Australia.

Heteroclinus adelaidæ, g. et sp. n., Castelnau, *l. c.* p. 247, South Australia.

Tripterygium compressum, sp. n., Hutton, Fish. of New Zealand, p. 32.

Pataecus waterhousii, sp. n., Castelnau, *l. c.* p. 244, South Australia.

Atherinidæ.

Atherina lineata, sp. n., Günther, A. & M. N. H. 1872, x. p. 398, Cebu and Amboyna.

Atherinichthys esox, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 34, Port Philip, S. Australia.

Atherinichthys modesta, *Atherinichthys picta*, *Atherinichthys cephalotes*, and

Atherinosoma (g. n.) *vorax* are described as new species from South Australia, by Castelnau, Proc. Zool. Soc. Victor. 1872, pp. 136–138.

Mugilidæ.

Mugil. On the anatomy of a New Zealand species (Kanac), Knox, Trans. N. Z. Inst. iv. 1872, pp. 189–191.

Mugil meyeri, sp. n., Günther, A. & M. N. H. 1872, ix. p. 439, Macassar.—*Mugil gelatinosus*, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 35, South Australia.

Agonostoma lacustris is described as a new species from the Gibbs Land Lakes by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 142.

Gobiesocidæ.

Trachelochismus guttulatus, sp. n., Hutton, Fish. of New Zealand, p. 41.

Labyrinthici.

Macropus. Observations on very young examples by N. Joly, Comp. Rend. 1872, p. 766; translated in A. & M. N. H. 1872, x. pp. 463–465.—On its development, Pouchet, Rev. et Mag. Zool. 1872, pp. 369–387, pls. 22–25.—On its anatomy and natural history, Boulart, J. Zool. 1872, pp. 243–254.—A further report on his efforts of breeding this fish by Carbonnier, Bull. Soc. Acclim. 1872, pp. 7–14.

Trachypteridæ.

Gymnetrus gladius. S. Jourdain reports on the external appearance and the results of his dissection of an example found on the coast of France. Comp. Rend. 1872, pp. 58–62.

ACANTHOPTERYGII PHARYNGOGNATHI.

Heliastes lividus, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 36, South Australia.

Chærops brenchleyi, sp. n., Günther, A. & M. N. H. 1872, x. p. 424, and in Brenchley's 'Cruise of the Curaçoa,' p. 426, pl. 34, Misol.

Chilinus aurantiacus is described as a new species from South Australia by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 245.

Labrichthys tetrica. Notes by Klunzinger, *l. c.* p. 37.—*Labrichthys bleekeri*, *L. richardsonii*, and *L. vestita* are new names given to fishes observed by Castelnau at Melbourne. *L. c.* pp. 148, 150, 151.

[*Platyglossus nigromaculatus* (Gthr. 1871). The Recorder has found that this fish has been described by Kner as *Leptojulis pardalis*, see Zool. Rec. iv. p. 168.]

Julis guentheri, figured by Günther in Brenchley's 'Cruise of the Curaçao,' p. 425, pl. 32. fig. A.

Heteroscarus (g. n.) *filamentosus* and *modestus*, spp. nn., Castelnau, *l. c.* p. 245, South Australia.

Odax obscurus is a new name given to a fish of this genus observed at Melbourne by Castelnau, *l. c.* p. 154.

Gerres melbournensis, described as a new species by Castelnau, *l. c.* p. 158 [must be a fish essentially different from *Gerres*, having 17 anal rays].

Hemichromis leiguardii, sp. n., Brito Capello, Jorn. Sc. Lisb. 1872, Bissao.

Acara. Mr. Cope (Proc. Ac. N. Sc. Philad. 1871, pp. 255-256) describes as new species from the Ambyiacu River:—*A. syspilus*, pl. 11. fg. 3; *A. flavilabris*, pl. 11. fig. 4; *A. freniferus* and *A. compressus*.

Geophagus amœnus is described as a new species from Pebas, allied to *Mesops tæniatus*, by Cope, *l. c.* p. 250.—*Geophagus badiipinnis*, sp. n., Cope, *ibid.* p. 251, pl. 11. fig. 1, Pebas. Mr. Cope maintains Heckel's genus *Geophagus* in its integrity.

Crenicichla. Mr. Cope describes as new species from the Ambyiacu River *C. anthurus* (pl. 10. fig. 1) and *C. proteus*. *L. c.* p. 252.

[*Mesonauta*] *Uarus centrarchoides* described as a new species from the Ambyiacu River by Cope, *l. c.* p. 253, pl. 11. fig. 2.

ANACANTHINI.

GADOIDEI.

Gadus australis, sp. n., Hutton, Fish. of New Zealand, p. 45.

Physiculus palmatus is described as a new species by Klunzinger, Arch. f. Nat. 1872, p. 38, South Australia.

Macruridæ. Dr. Liitken makes notes on an example of *Malacocephalus lævis* from the Danish coast, and appends a synopsis of the other fishes of this family. Vidd. Med. 1872, Feb. 2.

Macruronus novæ-zelandiæ [see Zool. Rec. viii. p. 103] figured in Hutton, Fish. of New Zealand, fig. 79.

Genypterus tigerinus is described as a new species from Melbourne by Klunzinger, Arch. f. Nat. 1872, p. 39.—The same fish is named *Genypterus australis* by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 164.

Vexillifer, g. n., Gasco, Bull. Assoc. Nat. e Med. Napol., April 1870, pp. 59-61. This is evidently an immature and very singular form of some Gadoid fish, perhaps belonging to the *Ophidiidæ*; the author regards it as a new genus, which he characterizes thus:—Corpus oblongum, compressum, ensiforme, alepidotum, fere pellucidum. Os non protractile, apertura magna, obliqua, maxilla inferiori adscendente. Dentes palatini minimi: dentes parvi, distantes, in utraque maxilla unico ordine: duo medii in maxilla inferiori majores, conici. Pinnæ dorsi et ani longissimæ, ad caudam inter se confluentes. Primum dorsalis radium, rigidum, valde elongatum, productum in filamentum, lobis cutaneis, discretis instructum. Pinnæ ventrales nullæ: pectorales minimæ, vix distinguendæ, pone branchialem hiatum sitæ. Vesica natatoria magna, trans cutem admodum perspicua.—*Vexillifer dephilippii*, sp. n., from Naples, *l. c.*, *c. tab.*—A note on this fish by Costa, Ann. Mus. Napol. vi. 1871, p. 88, t. 2. fig. 1.

PLEURONECTOIDEI.

H. E. Sauvage has found that the various degrees of development of the termination of the vertebral column in the genera *Rhombus*, *Solea*, and *Pleuronectes* are in accordance with their geological appearance. Comp. Rend. 1872, April 22.

Pseudorhombus muelleri, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 40, South Australia.

Rhombosolea. *Rhombosolea bassensis* and *Pleuronectes* (?) *victoriæ* are new names given by Castelnau to fishes, probably belonging to this genus, from Melbourne. Proc. Zool. Soc. Victor. 1872, pp. 167, 168.

PHYSOSTOMI.

Siluridæ.

Silurus glanis, var. *aralensis*, described by Kessler, N. Mém. Mosc. x. 1872, p. 4.

Bagrus ussuriensis, sp. n., Dybowski, Verh. z.-b. Ges. Wien, 1872, p. 210, Amur.

Platystoma gigas, sp. n., Günther, A. & M. N. H. 1872, x. p. 449, R. Huallaga.

Erethistes pusillus=*Hara buchanani* (Blyth). Day, P. A. S. B. 1872, p. 122.

Doras. Mr. Cope (Proc. Ac. N. Sc. Philad. 1871) figures *D. pectinifrons*, pl. 3; and describes as new species from the Amazons *D. grypus*, p. 270, pl. 15. fig. 1; *D. brachiatus*, p. 270; *Zathorax* (g. n.) *monitor*, p. 271, pl. 4. fig. 1; *Physopyxis* (g. n.) *lyra*, p. 273, pl. 5. fig. 1.

Callichthys. Mr. Cope (*l. c.*) describes the following as new species from the Ambyiacu River:—*C. melampterus*, p. 275, pl. 14. figs. 4 & 5; *Dianema* (g. n.) *longibarbis*, p. 276, pl. 7. fig. 1; *Brochis* (g. n.) *cæruleus*, p. 277, pl. 7. fig. 2; *Brochis dipterus*, p. 278, pl. 9. fig. 3; *Corydoras semiscutatus*, p. 280, pl. 6. fig 1; *Corydoras ambiacus*, p. 280; *Corydoras trilineatus*, p. 281, pl. 6. fig. 2; *Corydoras acutus*, p. 281; and *Corydoras amphibelus*, p. 282.

Plecostomus scopularius noticed as a new species from the R. Amazon by Cope, *l. c.* pp. 55, 286; and *Plecostomus biseriatus* described as a second new species from the same river, *ibid.* p. 285, pl. 16.

Liposarcus varius, sp. n., Cope, *l. c.* p. 285, Ambyiacu River.

Chætostomus. Mr. Cope (*l. c.*) describes as new species from the Ambyiacu River:—*C. alga*, p. 287, pl. 15. fig. 3; *C. malacops*, p. 287, pl. 5. fig. 2; *C. variolus*, p. 288; *C. tectirostris*, p. 288, pl. 15. fig. 2; and *C. sericeus*, p. 288.

Otocinclus, g. n., Cope, *l. c.* p. 283. Allied to *Hypoptopoma*, but with the posttemporal region pierced with numerous foramina.—*O. vestitus*, sp. n., pl. 4. fig. 2, Ambyiacu River.

Pariolius, g. n., Cope, *l. c.* p. 289. Allied to *Trichomycterus*, but without nasal barbel, with one maxillary and two lateral mentals.—*P. armillatus*, sp n., from the Ambyiacu River.

Cyprinidæ.

Mr. F. Day has published the fourth and fifth parts of his "Monograph of Indian Cyprinidæ." J. A. S. B. 1872, pp. 1–

29, 171–198, with 1 plate. [See Zool. Record, viii. p. 92.] The fourth part contains the species of *Barilius, Shacra, Pteropsarion, Bola, Danio, Cachius, Chela, Eustira,* and *Homaloptera,* and the fifth the *Cobitidina.*

Cyprinus carpio from Turkestan. Kessler, N. Mém. Mosc. x. p. 5.

Cyprinus auratus. On the reproduction and development of the large-eyed monstrosity, Carbonnier, Compt. Rend. 1872, Nov. pp. 1127–9.

Labeo diplostomus (Heckel) figured by Reginald Beavan. P. Z. S. 1872, p. 150.

"*Labeo boggut*, Sykes," described by Day, J. A. S. B. 1872, p. 259.

Rohita macrochir is a new name given by Dr. Bleeker to a [very inferior] Chinese drawing. Versl. Akad. Amst. vi. 1872, p. 119, fig. 1.

Crossochilus barbatulus (Heckel) figured by Reginald Beavan, P. Z. S. 1872, p. 152.

Capœta steindachneri, sp. n., Kessler, N. Mém. Mosc. x. 1872, p. 5, figs. 3–5, Turkestan.

Barbus. Kessler (*l. c.*) describes three species from Turkestan:—*B. conocephalus* (sp. n. ?), p. 6, figs. 6–8; *B. lacertoides* (sp. n. ?), p. 7; and *B. brachycephalus* (sp. n.), p. 8, figs. 9–11.

Barbus beavani. "Note on a hitherto unpublished drawing in the Buchanan-Hamilton Collection" by Günther, P. Z. S. 1872, pp. 875–878.

Oreinus eurystomus, sp. n., Kessler, *l. c.* p. 9, figs. 12–15; and *Oreinus minutus*, sp. n., Kessler, *l. c.* p. 11, from Turkestan.

Schizothorax. Kessler (*l. c.*) describes three new species from Turkestan:—*S. fedtschenkoi*, p. 11, figs. 16–18; *S. affinis*, p. 12; and *S. aksaimsis*, p. 13, figs. 19–21.

Diptychus sewerzowi, sp. n., Kessler, *l. c.* p. 14, f. 22, Turkestan.

Gobio fluviatilis, var. *lepidolæmus*, from Turkestan, described by Kessler, *l. c.* p. 15.

Gobiosoma amurensis, g. et sp. n., Dybowski, Verh. z.-b. Ges. Wien, 1872, p. 211, Amur.

Squalius intermedius, sp. n., Kessler, N. Mém. Mosc. x. 1872, p. 16, fig. 23; and *Squalius squaliusculus*, sp. n., Kessler, *ibid.* p. 17, fig. 24, from Turkestan.

Leuciscus erythrophthalmus in Turkestan. Kessler, *l. c.* p. 18.

Squalidus chankaensis, g. et sp. n., Dybowski, *l. c.* p. 215, Chanka Lake.

Telestes brandtii, sp. n., Dybowski, *l. c.*, Amur.

Plagiognathus jelskii, g. et sp. n., Dybowski, *l. c.*, Amur.

Barbodon lacustris, g. et sp. n., Dybowski, *l. c.*, Amur.

Tinca vulgaris. The well-known secondary sexual characters of the Tench described by Canestrini, Atti Soc. Pad. i. 1872, pp. 127–129, tav. 4 [see A. & M. N. H. (3) iii. pp. 385–387, pl. 16].

Chondrostoma peresi is described as a new species from rivers of Rouerque (France) by H. de la Blanchère. Compt. Rend. 1872, lxxv. pp. 1632–6, with woodcut.

Devario asmussii and *chankaensis*, spp. nn., Dybowski, *l. c.* p. 212, Chanka Lake.

Barilius bleekeri, sp. n., Day, J. A. S. B. 1872, p. 5, from a river at Gangrete.

Hypophthalmichthys (Blkr.) named *Onychodon* by Dybowski, Verh. z.-b. Ges. Wien, 1872, p. 211.

Alburnus tarichi (Pall.), from Lake Van, described and figured by Deyrolle, Rev. et Mag. Zool. 1872, p. 401, pl. 8.

Alburnus iblioides, sp. n., Kessler, *l. c.* p. 19, fig. 27, Turkestan, where occur also *Alburnus fasciatus* (Nordm.), figs. 25, 26, and *A. chalcoides* (Güldenst.).

Leucaspius delineatus found in Sweden, and described by Lilljeborg, Œfvers. Vet. Ak. Förh. 1871, pp. 815–821, Taf. 17.

[*Elopichthys bambusa.*] Basilewsky's *Nasus dahuricus* described by Dybowski, *l. c.* p. 214.

Acanthobrama kuschakewitschi, sp. n., Kessler, N. Mém. Mosc. x. 1872, p. 20, figs. 28, 29, Turkestan.

Pseudobrama melanotopterus and *P. hypselosoma* are new names given by Dr. Bleeker to two [indifferent] Chinese drawings. Versl. Akad. Amst. vi. 1872, p. 119, figs. 2 & 3.

Megalobrama skolkovii, g. et sp. n., Dybowski, *l. c.* p. 213, Amur.

Culter abramoides, sieboldii, rutilus, lucidus, spp. nn., Dybowski, *l. c.* pp. 213, 214.

Chela melanopus is a new name given by Dr. Bleeker to a Chinese drawing. *L. c.* p. 119, fig. 4.

Chela panjabensis, sp. n., Day, J. A. S. B. 1872, p. 25, Lahore.

Nemachilus. Kessler describes three new species from Turkestan, N. Mém. Mosc. x. 1872:—*Cobitis longicauda*, p. 21, figs. 30, 31; *C. uranoscopus*, p. 22, figs. 32, 33; and *C. dorsalis*, p. 23, figs. 34, 35.

Nemachilus evezardi, sp. n., Day, J. A. S. B. 1872, p. 182, Puna.—*Nemachilus aureus*, sp. n., Day, *l. c.* p. 184, Jabbalpur.

Characinidæ.

Nannostomus, g. n. Characin., Günther, P. Z. S. 1872, p. 146, from Demerara. Allied to *Lebiasina*. Dorsal fin placed nearly in the middle of the length of the body; adipose fin none; anal short; ventrals below the dorsal; caudal deeply forked. Body oblong, covered with large scales; lateral line none. Head of moderate size; snout subconical, with the mouth very narrow, quite anterior. Cheeks narrow, covered by the infraorbital bones. Both jaws armed with a single series of closely set, compressed, crenulated teeth. Palatine teeth?—*N. beckfordi*, sp. n.—D. 8. A. 10. L. lat. 22.

Holotaxis lætus, sp. n., Cope, Proc. Ac. N. Sc. Philad. 1871, p. 257, Ambyiacu River.

Anostomus tæniatus is the type of a separate genus, *Læmolyta*. Cope, *l. c.* p. 258.

Characidium etheostoma, sp. n., Cope, *l. c.* p. 259, pl. 8. f. 2, pl. 13. f. 3, Ambyiacu River.

Tetragonopterus streetsii, sp. n., Cope, *l. c.* p. 217, Mexico.—*Tetragonopterus phœnicopterus*, sp. n., Cope, *l. c.* p. 261.

Stethaprion chryseum, sp. n., Cope, *l. c.* p. 261, Ambyiacu River.

Iguanodectes, g. n., Cope, *l. c.* p. 260. Allied to *Tetragonopterus*. Dorsal fin originating in advance of ventrals; anal elongate. Branchiostegal membranes united across, but not with, isthmus. Teeth in two series in the premaxillary, none in the maxillary, and one row in the mandible; they are fixed, but have contracted fangs, and broad, flat, subequally denticulate crowns, and those of the mandible stand out from the dentary bones all round. Teeth of

the outer row very few, minute. Caudal fin furcate.—*I. tennis*, sp. n., pl. 8. fig. 1, from the Ambyiacu River.

Plethodectes, a new genus of 1870, is cancelled and referred to *Chalceus*. Cope, *l. c.* p. 262.

Brycon capito is described as a new species from the Ambyiacu River, *l. c.* p. 261.

Megalobrycon melanopterum and *Megalobrycon erythropterum* are described as new species from the Ambyiacu River, by Cope, *l. c.* pp. 262 & 263, pl. 13. fig. 1, and pl. 10. fig. 2.

Triportheus, g. n., Cope, *l. c.* p. 263. Intermediate between *Chalcinus* and *Chalcinopsis*. As new species from the Ambyiacu River are described *T. albus*, p. 264, pl. 8. fig. 3, pl. 14. fig. 2, and *T. flavus*, p. 264, pl. 14. fig. 1.

Chalcinus culter, sp. n., Cope, *l. c.* p. 265, pl. 14. fig. 3, Ambyiacu River.

Rœboides rubrivertex is described as a new species from the Ambyiacu River by Cope, *l. c.* p. 265.

Anacyrtus sanguineus is described as a new species from the Ambyiacu River by Cope, *l. c.* p. 266, pl. 9. fig. 1.

Xiphostoma tædo, sp. n., Cope, *l. c.* p. 267, pl. 13. fig. 2, Ambyiacu River.

Serrasalmo. Mr. Cope (*l. c.*) describes as new species *S. iridopsis*, p. 268, pl. 9. fig. 2, from the Ambyiacu River, and *S. æsopus*, p. 269, from the Upper Amazons.

Myletes. Mr. Cope (*l. c.*) describes as new species from the Ambyiacu River:—*M. albiscopus*, p. 267, pl. 12. fig. 1; *M. oculus*, p. 268, pl. 12. fig. 2; and *M. herniarius*, p. 268, pl. 12. fig. 3.

Osteoglossidæ.

The parallelism of the geographical distribution of these fishes with that of the *Sirenidæ* is pointed out by Günther, Pop. Sc. Review, 1872, p. 260.

Galaxiidæ.

Galaxias. Klunzinger describes as new species from South Australia *G. obtusus* and *G. rostratus*, Arch. f. Nat. 1872, p. 41; and Castelnau, in Proc. Zool. Soc. Victor. 1872, *G. ocellatus* (M'Coy, 1867), p. 175, *G. versicolor*, p. 176, *G. cylindricus*, p. 177, *G. delicatulus* and *G. amœnus*, p. 178.

Cyprinodontidæ.

Cyprinodon stoliczkanus, sp. n., Day, J. A. S. B. 1872, p. 258, Cutch.

Heteropygii.

Putnam, F. W. The Blind Fishes of the Mammoth Cave and their allies. Amer. Nat. 1872, pp. 6–30, with 2 plates (also p. 116).

In this elaborate article, the author describes the structure, habits, and distribution of the species known. He regards Girard's *Typhlichthys* as a distinct form, and distinguishes a second species of *Chologaster*, *C. agassizii*, from the subterranean streams in Tennessee. All the various forms are figured. The

author does not adopt the view that the peculiarities of these fishes are produced by adaptation to the physical conditions under which they are found now-a-days. We have only to go back to the time when the region now occupied by the subterranean streams was a salt and brackish-water estuary, inhabited by marine forms, including the brackish-water forms of the Cyprinodontes and their allies (but not descendants) the *Heteropygii*—the families and genera having the characters they now exhibit, but most likely more numerously represented than now. As the bottom of the basin was gradually more elevated, and the waters became confined to narrower limits, and changed from salt to fresh, only such species would continue as could survive the change; and they were of the type represented by the *Heteropygii*.

PUTNAM, F. W. Synopsis of the Family *Heteropygii*. Rep. Peab. Ac. 1872, pp. 15–23, pls. 1 & 2.

The author gives in this paper technical descriptions of the four fishes distinguished by him. The plates are the same as in the 'Amer. Nat.'

SCOMBRESOCIDÆ.

Belone. Prof. Canestrini has observed a species with vomerine teeth in the Adriatic, which he describes as *B. acus* (Risso). Fauna d'Italia, Pesce, p. 131.

STERNOPTYCHIDÆ.

Phosichthys [lege *Photichthys*], g. n., Hutton, Fish. of New Zealand, p. 55. Body rather elongated, compressed, without scales, but covered with a silvery pigment; a series of phosphorescent spots along the lower side of the body and tail; head compressed, with the bones thin; cleft of the mouth wide, obliquely descending; maxillary large, produced backward, and receiving the intermaxillary in the upper concave part of its margin; some large teeth in both jaws, and a single row of curved teeth on the palatine bones; pectorals small; dorsal in the centre of the body; adipose fin small; anal long; caudal divided into three portions, the central one sharp and pointed; branchiostegals numerous; pseudobranchiæ none.—*P. argenteus*, sp. n., *l. c.* p. 56.

SALMONIDÆ.

HIS, W. Ueber den Bau des Eies einiger Salmoniden. Verh. Ges. Basel, v. 1871, pp. 457–461. [On the structure of the egg of some Salmonoids.]

Salmo. Prof. Pavesi is of opinion that the Lake- and River-Trout in the Canton Ticino are merely variations of the same species. Pesci nel Ticino, pp. 47 *et seq.*

Salmo salar. "Die Flussfischerei in Böhmen," by Dr. A. FRITSCH (Arch. Landesdurchforsch. Böhm. ii. 4. Abth. pp. 46) is a paper of local

and practical interest, and mentioned here because it contains notes on the migration of the Salmon in Bohemia.

Salmo fario. Prof. Traquair describes a Trout with malformed caudal fin, "the so-called tailless Trout of Islay." J. Anat. Phys. vi. pp. 411–416, pl. 19.

Clupeidæ.

Dr. Bleeker's 26th part of the 'Atlas Ichthyologique,' which contains the text of the description of a portion of the East-Indian species of Clupeoids, has been noticed above, p. 82.

Engraulis antarcticus is a new name given by Castelnau to an Anchovy from Melbourne, Proc. Zool. Soc. Victor. 1872, p. 186.

Pellona altamazonica, sp. n., Cope, Proc. Ac. N. Sc. Philad. 1871, p. 256, Ambyiacu River.

Clupea pinguis, sp. n., Günther, A. & M. N. H. 1872, x. p. 425, and in Brenchley's 'Cruise of the Curaçoa,' p. 426, Misol.

Alosa. The Shad of the lakes of Northern Italy is described in detail, and its relations to *A. vulgaris* and *A. finta* are discussed by Prof. Pavesi, Pesci nel Ticino, pp. 54 *et seq.*

Muræniidæ.

Anguilla. G. Balsamo Crivelli and L. Maggi maintain that Eels are hermaphrodites, each individual being provided with a single testis and double ovaries. The eggs are impregnated in the abdominal cavity, but in what manner is not yet fully ascertained. The sexual organs are described. The authors distinguish an Eel with straight intestine (*Anguilla orthoentera*) and one with a convoluted intestine (*A. anacamptoentera*). Mem. Ist. Lomb. xii. 1872, pp. 220–240, with a plate; also in Arch. f. Nat. 1872, pp. 59–76. A review of this memoir, by Canestrini, Atti Soc. Pad. i. 1872, pp. 70–74.

Ophichthys. Dr. Günther describes three new species, A. & M. N. H. 1872, x., viz.:—*O. pinguis*, p. 425, from the Salomon Islands; *O. filaria*, p. 425, and *O. misolensis*, p. 426, from Misol.—These species are also described in Brenchley's 'Cruise of the Curaçoa': *O. filaria*, p. 428, pl. 33. f. A; *O. pinguis*, p. 430, pl. 35; and *O. misolensis*, p. 430.

Incertæ sedis.

Neocorassius ventricosus is described as a new form of Cyprinoid fish, without any trace of teeth, from a salt-water river in Victoria, by Castelnau, Proc. Zool. Soc. Victor. 1872, p. 236.

LOPHOBRANCHII.

Mr. Cope includes these fishes with the *Fistulariidæ*, *Centriscidæ*, and *Gastrosteidæ* in a "division of the *Physoclysti* which he called the *Hemibranchii*." Proc. Ac. Nat. Sc. Philad. 1871, p. 158.

Syngnathus curtirostris noticed by Castelnau as a new species from South Australia, Proc. Zool. Soc. Victor. 1872, p. 243.

Doryichthys elevatus, sp. n., Hutton, Fish. of New Zeal. p. 68.

Stigmatophora longirostris, sp. n., Hutton, *l. c.* p. 69.—*S. boops* noticed as a new species by Castelnau, *l. c.* p. 203, and *S. olivacea*, ibid. p. 244, South Australia.

Urocampus carinirostris, sp. n., Castelnau, *l. c.* p. 200, South Australia. [The same species was described by the Recorder at a later period, before he became acquainted with Castelnau's paper, as *Urocampus cælorhynchus*, Journ. Mus. Godeff. ii. 1873, p. 103.]

Gastrotokeus gracilis, sp. n., Klunzinger, Arch. f. Nat. 1872, p. 44, South Australia.

Hippocampus tristis is a new name given by Castelnau to a fish of this genus from Melbourne. *L. c.* p. 197.

PLECTOGNATHI.

These fishes "are *Physoclysti* in all respects." Cope, Proc. Ac. Nat. Sc. Philad. 1871, p. 157.

Balistidæ. Their osteological affinities are with the *Acronuridæ*. Dareste, Compt. Rend. 1872, June 17, pp. 1527–1530; A. & M. N. H. 1872, x. pp. 68–70; or J. Zool. 1872, pp. 268–272.—"Beiträge zur Osteologie des Genus *Balistes*," by Klein, Württ. nat. JH. 1872, pp. 262–300, Taf. 2.

Monacanthus forsteri and *M. prasinus* are new names given by Castelnau to fishes of this genus from Melbourne. Proc. Zool. Soc. Victor. 1872, pp. 204 & 205.—Likewise *Monacanthus ferulifer*, Castelnau, *ibid.* p. 245.

Aracana amœna is a new name given by Castelnau to a fish of this genus from Melbourne. *L. c.* p. 207.

Hemiconiatus guttifer found at Malaga. Perez Arcas, An. Soc. Esp. i. p. 4.

Tetrodon. According to Peters, *T. punctatus*, Bl. Schn.,= *T. stellatus*, and *Chelichthys punctatus*, Müll. & Trosch.,= *T. psittacus*. SB. nat. Fr. 1872, p. 47.

Diodon blochii is a new name given by Castelnau to a fish of this genus from Melbourne. *L. c.* p. 210.

CYCLOSTOMATA.

Petromyzon ernstii described as a new species from the Amur by Dybowski, Verh. z.-b. Ges. Wien, 1872, p. 220.

Yarra singularis (g. et sp. n.) and *Neomordacia howittii* (g. et sp. n.) are new forms of Lampreys from South Australia, described by Castelnau, Proc. Zool. Soc. Victor. 1872, pp. 231 & 232.

MOLLUSCA

BY

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WEINKAUFF, H. C. Ein Streiflicht auf unsere Kenntniss der geographischen Verbreitung der Meeres-Mollusken. Nachr. mal. Ges. 1872, pp. 33–43.

Complete volumes have been published of the following Conchological Journals for 1872:—*Malakozoologische Blätter* (xix. & xx.), *Journal de Conchyliologie* (xx., or xii. of ser. 3), and *Nachrichtsblatt der deutschen malakozoologischen Gesellschaft* (iv.). In the *American Journal of Conchology*, parts 3 and 4 of volume vii. were issued in March and May 1872, but no more has reached the Recorder. The *Société malacologique de Belgique* have published vol. vii. of their *Bulletins* or *Procès-verbaux* for 1872; but no part of its *Annales* nor any of the *Bullettino Malacologico Italiano*, or of the Spanish *Hojas Malacologicas*, appears to have been published in that year.

THE GENERAL SUBJECT.

Anatomy and Physiology.

G. Huguenin describes the following portions of the eye of *Helix pomatia*:—a refracting substance or lens, surrounded by a ring of black pigment; ganglionic masses in the hinder part; and cones on the retina formed by the terminations of the optic-nerve fibres. When the feeler is retracted, the lens and pigment-ring are directly drawn back, but the retina is pushed aside and follows these parts. Z. wiss. Zool. xxii. pp. 126–136, pl. 10. W. Flemming, criticizing this paper, states that the part considered by Huguenin to be the cushion of the retina (Retina-Polster) is really the front epithelium of the button of the feeler, with the subjacent ganglionic stratum, the mistake arising from the eye having been observed in a state of semiretraction. *Ibid.* pp. 365–369, pl. 31.

Lacaze-Duthiers, discussing the auditory capsules (which he calls *otocysts*) of the Gastropods, fully confirms Leydig's statement that the auditory nerve always originates in the supra-œsophageal or cerebroid ganglion, the centre of all specific sensitive nerves, but is occasionally embodied for some distance with other nervous strings, and then appears to issue from another ganglion. The nerve itself is a hollow tube, as observed by Ad. Schmidt in 1857 (Z. ges. Naturw.). The following are the principal differences in the situation of the otocysts:—

1. Remote from the pedal ganglions in *Cyclostoma elegans* (as to this organ, the author does not entirely agree with the description given by the late E. Claparède in 1857), *Pileopsis hungarica*, *Natica monilifera*, *Calyptræa sinensis*, *Paludina vivipara*, *Murex brandaris*, and *Purpura lapillus*.

2. Near to, but separate from, the pedal ganglions, or anterior centre, in *Neritina fluviatilis*, *Patella vulgata*, and *Haliotis tuberculata*.

3. Lying on the pedal ganglions in *Bullæa aperta* and in the *Pulmonata*, of which the following species have been examined:—*Succinea putris*, *Limax agrestis*, *Helix aspersa*, *Zonites* [*Hyalina*] *cellarius*, *Testacella maugeri*, *T. haliotidea*, *Limnæa stagnalis*, *L. auricularia*, *Planorbis corneus*, *Ancylus fluviatilis*, and *Clausilia nigricans*.

4. Directly and openly connected with the supra-œsophageal ganglion.
   a. By a long nerve in the *Heteropoda*: *Carinaria* and *Firola*.
   b. Sessile in *Æolis*.

Although it is not yet proved by experiment that these otocysts are really the special organs for hearing, there can be scarcely any doubt that they are so, from their anatomical relations. Arch. Z. Par. i. pp. 97–166, pls. 2–6.

E. R. Lankester adds to these observations, that in the *Nudibranchiata* the auditory capsule develops from the cells of the outer layer of the embryo, and in the *Cephalopoda* by an intrusion of the outer layer, the orifice of the cavity so formed eventually closing in, and its neck remaining as the curious little ciliated appendage described by Kölliker. Q. J. Micr. Soc. (2) xii. p. 418.

W. Flemming (Arch. mikr. Anat. vi. 1870, p. 410) and Jobert (J. de l'Anat. 1871, p. 611) also discuss the feelers and the epithelium of the sensitive organs in the *Mollusca*; the former (Z. wiss. Zool. xxii. pp. 369–371) states further that the large cells on the inside of the skin of the feelers and body, figured in his first paper, are really ganglionic cells, and that epithelial warts, crowned with rigid hairs, have been observed in large numbers on the head, on the edge of the mantle, and on the filaments at the sides of the foot in *Trochus cinerarius* (L.). These may also be specific sensitive organs.

In some remarks on the development of various genera of *Prosobranchia* (3rd meeting of Russian naturalists at Kiew, and Z. wiss. Zool. xxii. pp. 285–289), Prof. Ganin states, in opposition to Gegenbaur, that no bending of the heart, or coalition of an anterior and posterior aorta, or of two atria, takes place. Dr. Salensky considers there are two distinct types of development, in one of which (*Calyptræa*, *Nassa*, and probably most *Ctenobranchia*) the velum is developed very late, and some primordial provisory organs occur, which afterwards disappear, and in the other (*Trochus*, and probably the rest of the *Aspidobranchia*) the velum is one of the first formations, and no such organs occur. Prof. Kowalevsky thinks that the mantle of the *Mollusca* may, on account of its development, be homologous with the embryonal envelope of the *Insecta*.

The mathematical form of the spiral shell is the subject of an Inaugural Dissertation by A. H. Grabau (*vide suprà*), who briefly reviews former publications on this subject, and comes to the conclusion that, although Naumann does not sufficiently consider errors arising from the difficulty of accurate observation of the inner whorls, or of the determination of the right mathematical line in tuberculated or plaited shells, yet his term "conchospiral" is a more adequate expression for the spiral line of many shells than "logarithmic spiral," adopted by others and formerly by

himself. These observations are made chiefly on discoidal shells (*Ammonites, Planorbis*), or others with a short blunt spire, as, for instance, *Natica glaucina* and *aperta*. Shells with an elongated pointed spire offer much more difficulty.

Cf. also "Observations on the mode of growth of discoid and turbinated shells," by A. Macalister, Ann. N. H. (4) vi. 1870, p. 260, and P. R. Soc. xviii. 1870, p. 529 (omitted from preceding vols. of Zool. Rec.).

The chemical composition of the shell of 7 species of *Pulmonata* and 4 of freshwater bivalves has been analyzed by A. Döring, Inaugural Dissertation, Göttingen, 1872.

S. Clessin describes the habits of snails during the winter, their burying in the ground, often in crowds, the formation of the epiphragm, the interruption in the growth of the shell &c. He thinks that slugs and freshwater snails are less sensible to the influence of season, hiding themselves later in autumn, and coming forth earlier in spring than *Helix*, and that young specimens are less sensible than older ones. CB. Ver. Regensb. xxvi. pp. 114–130.

A specimen of *Helix pomatia* lived for 11 months without feeding, and slept for 17 weeks. Its weight was diminished by 0·13 gr., or 0·6 per cent. daily. J. v. Sivers, CB. Ver. Riga, xix. p. 112.

The growth of *Limnæa stagnalis* is much slower if young individuals are confined in society than when isolated, although apparently enough food is provided. C. Semper (Würz. nat. Z. ?), separate print of 9 pp., 1872.

Oysters kept in water with 1·8–1·2 per cent. salt lived for some time, but became very thin. Meyer, Nachr. malak. Ges. 1872, pp. 3–5.

Monstrosities and Deformities.

A rather large number of scaliform specimens of *Planorbis complanatus* (*marginatus*, Drap.) have been observed by L. Piré in a pond thickly covered by *Lemna minor*. Van d. Broeck suggests that the difficulty encountered by flat-shelled mollusks in making their way through the thick layer of duckweed may cause these deviations (Bull. Mal. Belg. vii. pp. x–xxi), and proves by experiment that scaliform specimens make their way more easily through the duckweed than those of normal shape. *Ibid.* pp. xxxiii–xxxviii. *Cf.* also a paper by Piré, Brussells, 1871, 7 pp., 2 pls.

S. Clessin, discussing similar cases of deformities in *Planorbis fontanus, albus, deformis*, and *contortus*, in which (either in a pond filled with water-plants or on the shores of lakes between stones) many individuals exhibit distorted or screw-like separated whorls, insists that there can be no transmission of these deformities, but that each individual, when growing, is caused to deviate from the normal form by obstacles or external agencies. Mal. Blätt. xx. pp. 68–83.

In districts either poor in, or devoid of, limestone, the shells of snails become very thin and pellucid, and very often the living animals gnaw the shells of their fellows, even to a highly injurious degree, in order to procure carbonate of lime; the shells of the *Clausiliæ* are shorter than usual; *Helix lapicida* is rather rounded in the periphery; and several species are entirely wanting. The pale-coloured or albino varieties, however, are not due to this cause, but, on the contrary, are often to be found rather copiously in regions abounding in limestone. *Id.* CB. Ver. Regensb. xxvi. pp. 50–58.

Helix nemoralis, var. *pallida* (an albino form), and a scalariform specimen of the same (figured). LE COMTE, Bull. Mal. Belg. vii. pp. xxvii & xxviii.

Specimens of *Helix hortensis* of a peculiar brownish hue found near tanneries by TISCHBEIN, Nachr. mal. Ges. 1872, p. 44.

Limnæa stagnalis. Rose-coloured specimens and a variety with two pillar-plaits. COLLIN, Bull. Mal. Belg. vii. p. xliii.—Specimens with apparently doubled tentacles. *Id. ibid.* p. lii.—Sinistral specimens and others of an hereditary yellow colour. *Id. ibid.* p. lx.

Shell of *Limnæa stagnalis* damaged by others of the same species gnawing it to get calcareous matter. WIECHMANN, Arch. Ver. Mecklenb. xxvi. pp. 95–97.

The living animal of *Helix arbustorum* observed destroying its own epidermis by gnawing. KOBELT, Nachr. mal. Ges. 1872, p. 44.

Clausilia biplicata (Mont.) and *plicatula* (Drap.). Several specimens with a double peristome were found in June 1872, on the same spot, by S. CLESSIN, who considers that the rainy weather of the season enabled the animals to continue their growth without interruption. Mal. Blätt. xx. pp. 58–61, pl. 4. figs. 1–3.

GEOGRAPHICAL DISTRIBUTION.

a. LAND AND FRESHWATER MOLLUSCA.

1. *Northern and Central Europe.*

Norway. O. S. JENSEN gives an account of land and freshwater mollusks observed during a summer journey in the two southern provinces of Norway, Christiania and Christiansand, adding 31 species to those enumerated about 20 years ago by J. Triele. The slugs, as well as the small species of *Pupa* and *Pisidium*, are treated with special care. N. Mag. Naturv. 1872, pp. 146–188.

United Kingdom. Land and freshwater shells collected in Ireland and Wales by J. LINDAHL are mentioned by C. WESTERLUND, Nachr. mal. Ges. 1872, p. 26.

Belgium. The following lists of land and freshwater Mollusks are published in Bull. Mal. Belg. vii.:—by M. PIRÉ, 69 species from the province of Liége, pp. vii–x; by M. COLLIN, 24 from the Rupel, a tributary of the Scheldt,

p. xxxii; accounts of excursions by Van den Broeck, pp. xliii–xlvi, lx–lxv; 28 species from Virtou, by J. Colbeau, pp. c–ciii.

Hyalina subterranea (Bourg.) found in Holland and Belgium by E. Friedel. Nachr. mal. Ges. 1872, p. 44.

Germany. *Helix lamellata* (Jeffr.), *Hyalina alliaria* (Miller), and *Pupa umbilicata* (Drap.) observed in the environs of Kiel by W. Fack, Nachr. malak. Ges. 1872, pp. 5–8; *Cyclostoma elegans*, near Segeberg, in Holstein, Friedel, *ibid.* p. 44.

Clausilia pumila (Ziegl.), *dubia* (Drap.), var. *speciosa* (A. Schmidt), *Balea perversa* (L.), and *Limnæa glabra* (Müll.) observed in Mecklenburg. Wiechmann, Arch. Ver. Mecklenb. xxv. p. 130.

The land and freshwater mollusks of Alsace (*cf.* Zool. Rec. viii. p. 124) are compared with those of the neighbouring countries, and especially of the Grand Duchy of Baden, by E. v. Martens, who comes to the conclusion that they are almost all identical, and that only in the south of Alsace, near Belfort and the affluents of the Doubs, species belonging to a more southern fauna make their appearance. Mal. Blätt. xix. pp. 160–171.—F. Meyer adds a few species observed near Weissenburg, in Alsace. Nachr. mal. Ges. 1872, p. 73.

The species of *Clausilia* occurring in Southern Bavaria are discussed by S. Clessin, and *C. filograna* (Ziegl.) added to them, raising the number to 15. Nachr. mal. Ges. 1872, pp. 50–55.

The freshwater mollusks living in Lake Starnberg, S. Bavaria, are discussed, certain species being noted as exhibiting remarkable modifications, probably caused by the agitation of the waves: these are *Limnæa stagnalis* (L.), var. *lacustris*, *L. tumida* (Held), *Valvata piscinalis* (Müll.), var. *contorta* [*antiqua* (Morris)], *Anodonta anatina*, var. *lacustris*, subvar. *rostrellata* [*rostell-*], and *Unio pictorum* (L.), var. *decollata*, subvar. *arca* (Held). S. Clessin, Mal. Blätt. xix. pp. 109–125.

The following species are added by V. Gredler to his former list of land and freshwater shells from the Tyrol:—*Daudebardia rufa*, *Achatina* (*Cæcilianella*) *gredleri* (Küster), *Pupa gredleri* (Clessin), *P. substriata*, var. *sextana*; numerous new localities are indicated, and the specific differences of some species of *Pupa* discussed. Nachr. mal. Ges. 1872, pp. 66–74.

France. Several species of slugs, new or little-known, observed in the Department of the Oise are described and figured by A. Baudon, Mém. Soc. Oise, vii., 22 pp. 4. pls.

2. *Southern Europe.*

Helix quimperiana (Fér.) found in large numbers near Hendaye, Dép. Basses-Pyrénées. De Nansouty, J. de Conch. xx. pp. 123 & 196.

Italy. 41 species of terrestrial mollusks observed in the Villa Serbelloni, at Bellaggio, Upper Italy, are enumerated by C. M. Poulsen, Nachr. mal. Ges. 1872, pp. 22–25; the most numerous among them is *Helix angigyra* (Jan), the most local *H. tigrina* (Jan).

Notes on land-shells observed in various localities of Upper Italy. W. Kobelt, Nachr. mal. Ges. 1872, pp. 81–83.

A. Issel, in an appendix to his former list of land and freshwater shells of the province of Pisa, brings their number up to 99 terrestrial, 45 freshwater, and 3 submarine (*Alexia*, *Paludestrina*) species, and adds several, as

well as new localities and corrections of names. Atti Soc. Ital. xv. part 1 (21 pp.).

Land-shells collected at Gibraltar (including a new *Pupa*), Algiers, Tunis, and Malta by J. Lindahl, are enumerated by C. A. Westerlund, Nachr. mal. Ges. 1872, p. 26.

Greece. The land and freshwater shells known from the Peloponnesus (76 species) are reviewed by E. v. Martens, Mal. Blätt. xx. pp. 31–50, with descriptions of several new or imperfectly known, collected by E. Raymond in Laconia, Arcadia, and Argolis; among the most remarkable are 2 new species of *Clausilia*, both dextral.

3. *Western Asia.*

Siberia. Land and freshwater mollusks observed near the mouth of the Jenisei are mentioned by Friedr. Schmidt, Mém. Pétersb. xviii. 1, pp. 47 & 48 (repeated by the Recorder in Nachr. mal. Ges. 1872, pp. 71–73). *Limax agrestis* and *Succinea putris* occur on the Brjochow island, in the lowest part of that river, 70½°–71° N. lat. A small species of *Pisidium* is the only shell found on the 'tundrs'; *Anodonta anatina* is found in the river up to 69° N. lat., and *Limnæa stagnalis* up to 66°; but *Helix schrenki* appears here not to pass the northern limit of the woods, 67°–70°.

Turkestan. Notes on land shells collected by Fedtschenko are given by the Recorder, SB. nat. Fr. 1872, pp. 61–63.

Beloochistan. Some preliminary notes on its fauna, of which the *Mollusca* are apparently very scarce, are given from a letter written by W. T. Blanford in J. de Conch. xx. p. 287; *Pupa insularis* (Ehrenb.) is the only land-shell observed; and among the freshwater shells are *Melania tuberculata* (Müll.), a sp. of *Limnæa*, and one of *Planorbis*.

4. *Africa.*

Preliminary notes on the land and freshwater shells of the environs of Alexandria, Cairo, Massowa, and the maritime parts of Abyssinia are to be found in Jickeli's account of his voyage, Mal. Blätt. xx. pp. 1–20, 99–108. 21 species (one from Alexandria, the rest from Habab and Hamaszen, Abyssinia) are described by the same author, *ibid.* pp. 99–108.

Madeira. 3 species of slugs and 3 of *Vitrina*, the first considered identical with European species, the latter peculiar, are enumerated by Mörch, Vid. Medd. xi. pp. 11 & 12.

A. Mousson ('Révision de la Faune Malacologique des Canaries,' founded on the examination of the shells brought from those islands by MM. Blauner, Hartung, Wollaston, Fritsch, and Reiss) enumerates all the known species, with diagnoses and descriptive or critical remarks on each, and a table showing the geographical distribution through the seven principal islands of that group; there are 183 good species (excluding 13 as questionable or uncertain), among which are only 9 true freshwater mollusks and 3 submarine (*Marinula, Alexia, Truncatella*). Of these, 26 species have been found on

Lanzarote, 30 on Fuerteventura, 43 on Grand Canary, 90 on Teneriffe, 24 on Gomera, 43 on Palma, 17 on Hierro, and of 6 the particular localities are not yet known; 177 are certainly still living, the rest appearing to be extinct (subfossil); 16 species only are European. The subgenera and genera prevailing in the Canaries coincide somewhat more with those of Spain than of Madeira and Porto Santo; and the subgenus *Hemicycla*, *Monilearia*, and several species of *Gonostoma* with a simple peristome among the *Helicidæ*, the group *Napæus* among the *Bulimi*, and the entire want of the genera *Clausilia*, *Succinea*, and *Limnæa* appear the most characteristic features of the fauna. The 6 plates of this work are also published in Pfeiffer's 'Novitates Conchologicæ,' iv. parts 40–43, as plates 119, 120, 122–124, with the same numbers of figures.

St. Helena. 15 species of land-shells found by J. C. Melliss on this island are enumerated by J. G. Jeffreys, Ann. N. H. (4) x. p. 264; 8 of these appear to be peculiar to the island, 5 are European, 2 not specifically determined, and 5 others, apparently also peculiar, have been described by former authors from the same island. Martens, Nachr. mal. Ges. 1872, pp. 58 & 59.

Madagascar. 2 new freshwater shells described by Crosse and Fischer, J. de Conch. xx. pp. 209 & 210.

5. *East Indies.*

Hanley and Theobald's 'Conchologia Indica' (1870) is a collection of figures of land and freshwater shells from British India, just in the same manner as those in Reeve's 'Conchologia Iconica,' and often apparently copied from that work, and therefore useful enough for the determination of such shells; but the letterpress is even poorer and less satisfactory than that of Reeve, no descriptions being given, but only the name, some quotations, and localities. Each plate contains mostly shells of the same genus; but beyond this there is no systematic arrangement (even *Nanina* is not separated from *Helix*). The 3 parts seen by the Recorder contain 60 plates and 28 pp., and treat of the following genera:—*Cyclophorus*, pls. 1–4, 33, 34, 47, 48; *Leptopoma*, 6; *Aulopoma*, 4 and 47; *Cyclotus*, 4; *Pterocyclus* (including *Spiraculum* and *Rhiostoma*), 5 and 49; *Otopoma*, 6; *Megalomastoma*, 7; *Lagochilus*, 6; *Pupina*, 7; *Pomatias*, 7; *Helicina*, 6; *Bythinia*, 37 & 38; *Stenothyra*, 37; *Boysia* and *Hypselostoma*, 8; *Streptaxis*, 8; *Helix*, 13–16, 25–32, 50–60; *Bulimus*, 19–23; *Achatina*, section *Electra*, 17, 18, 35, 36; *Spiraxis*, 19; *Clausilia*, 24; *Unio*, 9–12, 41–46; *Trigonodon* and *Pseudodon*, 9; *Spatha* [?], 9. Several species already described by Benson and others appear to be figured for the first time in this work.

The land and freshwater shells described at the close of the last century

by Chemnitz and Spengler as received from the Danish possessions on the coast of Coromandel are critically reviewed by Mörch, J. de Conch. xx. pp. 333–345. There are 2 of *Ariophanta* (one, *A. nicobarica*, Chemn., probably ascribed in error to the Nicobar Islands), 5 *Nanina*, 4 *Helix* (all probably attributed in error to that coast), 3 *Bulimus*, 1 *Amphibulima*, 1 *Succinea*, 1 *Subulina*, 1 *Planorbis*, 1 *Limnæa*, 4 *Cyclophorus* (some erroneous), 1 *Leptopoma*, 1 *Tortulosa*, 2 *Ampullaria*, 1 *Viviparus*, 2 *Bythinia*, *Paludomus tanschauricus* (Gmel.), 2 *Melania*, 1 *Pythia*, 1 *Navicella*, 1 *Corbicula*, 9 *Unio* (some erroneous).

23 land and freshwater shells collected on the coast of Coromandel by J. Reinhardt, 1845, are enumerated by Mörch, Vid. Medd. 1872, pp. 13–16.

Nicobar Islands. The land and freshwater shells of these islands are critically reviewed, and many new species (found during the Danish Expedition in 1846) described by Mörch; he enumerates 7 species of *Nanina* (of various subgenera), 1 *Helix*, *Helicostyla codonodes* (Pfr.), 1 *Opeas* [*Stenogyra*], 1 *Hyalimax*, the widely spread *Ennea bicolor* (Hutt.), 1 *Alycæus*, 4 *Cyclophorus*, 1 *Leptopoma*, 2 *Omphalotropis*, 2 *Helicina*, 4 *Melania*, 1 *Cerithidea*, 1 *Telescopium*, 3 *Pythia*, 8 *Neritina*, 3 *Peronia*, 1 *Cyrena*, 2 *Batissa*, and 1 *Alasmodonta*, or 20 land, about 13 freshwater, and 8 brackish-water *Mollusca*. The species mentioned by G. v. Frauenfeld as found during the Austrian expedition, 1858, on these islands are criticized. J. de Conch. xx. pp. 303–333, and Vid. Medd. xi. pp. 9–35.

The Himalayan, Assamese, Burman, and Cingalese species of *Clausilia* are enumerated, described, and figured by W. T. Blanford, J. A. S. B. xli. part ii. pp. 199–206, pl. 9; to which Stoliczka adds a postscript, pp. 207–210, raising the number of species to 20. Not one has hitherto been found in India proper south of the Himalaya, not even in the semi-Malayan fauna of the Malabar coast, and only one in Ceylon. There are 2 in the Western Himalaya, westwards of Nepal, 1 in Sikkim and Bhotan, and 16 in Transgangetic India, from the Khasi hills to Martaban.

Some new species of land and freshwater shells from the Khasi, North Cachar, and Naga hills, N.E. Bengal, are described by Godwin-Austen, P. Z. S. 1872, pp. 514–518, pl. 30, and by Brazier, *ibid.* pp. 617–619.

Several species of land-shells found in Burmah and Arakan are mentioned, and 8 described as new, by W. Theobald and F. Stoliczka, J. A. S. B. xli. part 2. pp. 329–334, pl. 11.

Pulo Penang. The *Cyclostomacea* observed on this island are described by Stoliczka, *l. c.* pp. 261–271; he enumerates 2 species of *Cyclophorus*, 2 *Opisthoporus*, 1 *Pupina*, 1 *Alycæus*, and 2 *Lagochilus*; of these, 6 are new, while 3 are identical with species from the continent of the Transgangetic peninsula.

Celebes. The land-shells from that island, so far as hitherto known, are reviewed; and some new species collected by Dr. A. B. Meyer, raising their number to 50, are added by E. v. Martens, Mal. Blätt. xx. pp. 155–177, pl. 5. Most of them are peculiar to that island (even to its northern or southern extre-

mity); and a few are possessed in common with Borneo, the Philippines, or the neighbouring islands of the Moluccas.

Brazier gives some notes concerning the synonymy and localities of several Australian and Western Polynesian land-shells. P. Z. S. 1872, pp. 805–808.

Several new land-shells from Australia and the Solomon Islands described by J. Cox and J. Brazier, *ibid.* pp. 18–21, pl. 4, and by G. F. Angas and H. Adams, *ibid.* pp. 610–614, pl. 42.

The new edition of J. B. Gassies's Fauna of New Caledonia, forming a part of Act. Soc. L. Bord. (see Zool. Rec. viii. pp. 116 & 126) has also been published as a separate work at Paris, and provided with 8 col. plates. Some critical notes concerning it will be found in J. de Conch. xxi. pp. 91–94.

Some new land and freshwater shells from New Caledonia, described by H. Crosse, J. de Conch. xx. pp. 69–71, 148–153, 156, 157, 225–227, 352–360, pl. 16, by Souverbie, *ibid.* p. 148, and by Gassies, *ibid.* pp. 365–367.

Several new species of *Pitys* (*Endodonta*) from Cook's Isles, all known species of *Bulimus*, including 7 new, and some other new land, freshwater, and brackish-water mollusks from the Viti Islands, are described by A. Garrett, Am. J. Conch. vii. pp. 219–236, pls. 18 & 19.

Some observations concerning the distribution of the subgenera of *Achatinella* in the Sandwich Islands, by M. Gulick, are to be found in Bull. Soc. Mal. Belg. 1872, pp. cxii–cxiv.

6. *Tropical America.*

The land-shells collected by the scientific commission sent by the Spanish Government, in 1862–1865, across the continent of South America, are fully described by Gonzales Hidalgo in a new work cited above. The Recorder has not seen this work; but it appears from an announcement in J. de Conch. xiii. 1873, pp. 79–81, that most of the species described in it were previously published and figured in that journal; and most of these have now been reprinted in the same author's 'Coleccion de las Memorias,' &c.

The second part of Crosse and Fischer's work on the terrestrial and freshwater Mollusks of Mexico has been published in 1872, pp. 153–304, pls. 7–12: it contains the genera *Zonites* (including *Hyalina*) 19 sp., *Limax* 1, *Tebennophorus* (*Philomycus*) 1, *Xanthonyx* 4, *Helix* 54, and *Berendtia* 1. All the species are described, partly from originals; many are figured; and the anatomy of some of them is completely given.

New species from *Mexico* and *Central America* described. Crosse & Fischer, J. de Conch. xx. pp. 59, 60, 73–77, 222–225, 301–303.

Nicaragua. The land-shells of that country agree partly with those of Mexico, but still more with those of the continent of South America. R. Tate, Brit. Assoc. Rep. 1870, p. 117.

Jamaica. 25 species of *Helix*, 1 *Bulimus*, 1 *Achatina* (*iota*, Ad.), 8 *Glandina*, 1 *Macroceramus*, 14 *Cylindrella*, 1 *Geomelania*, 4 *Truncatella*, 4 *Cyclotus*, 3 *Choanopoma*, 3 *Adamsiella*, 4 *Cyclostomus*, 7 *Tudora*, 8 *Stoastoma*, 3 *Trochatella*, 1 *Lucidella*, 6 *Helicina*, 5 *Alcadia*, 2 *Proserpina*, 4 *Melampus*, 1 *Pedipes*, 1 *Carychium* are enumerated, and their stations indicated from personal observation, by C. P. Gloyne, J. de Conch. xx. pp. 26–48.

Antigua. Some preliminary notes on the malacological fauna are given by M. Purves, Bull. Mal. Belg. vii. pp. civ–cvi.

Surinam. Several land-shells collected by Herr Kühn are mentioned, and three new species described, by L. Pfeiffer, Mal. Blätt. xix. pp. 74–76.

Ecuador. 60 species of land-shells and 7 of freshwater shells collected by Mr. Buckley are enumerated, and 7 of them described as new, and figured, by E. T. Higgins, P. Z. S. 1872, pp. 685–687, pl. 56.

7. *North America.*

Prof. Haldeman's important work on the freshwater univalve *Mollusca* of the United States, discontinued 25 years ago, has been brought to a conclusion in 1871 by the publication of its 9th number, in accordance with the author's original plan. G. W. Tryon at the same time commences under the same title a supplement containing all the species detected after the publication of Haldeman's work, with various remarks on the older species, and comprising in Nos. 1–3 the *Ctenobranchia*, *Physa*, and *Limnæa*.

Out of 62 terrestrial and 57 freshwater *Mollusca* enumerated in the 2nd edition of Gould's Report on the *Invertebrata* of Massachusetts, Mr. Jeffreys states 24 terrestrial and 13 freshwater to be identical with European species. [Some of these are probably so referred in error; for example, *Valvata tricarinata*, which Jeffreys suggests to be a variety of *piscinalis*!] Ann. N. H. (4) x. pp. 237–247.

14 species of freshwater *Mollusca*, partly undetermined, have been found by dredging in Lake Ontario, by H. A. Nicholson. *Ibid.* pp. 282, 283.

On the land-shells of *Western Massachusetts*, *cf.* W. G. Freedley, Am. Nat. v., Nov. 1871 [not seen by the Recorder].

Land-shells collected by Dr. R. K. Reid and others in the Salt-Lake district are treated by J. D. Cooper, P. Cal. Ac. iv. part 3, 1871, with some critical remarks on the geographical distribution of the land-shells of the Western Slope of N. America.

3 land-shells from *Alaska* discussed by the Recorder, Mal. Blätt. xix. pp. 78–80.

b. Marine Mollusca.

1. *Northern Seas of Europe.*

83 species of marine mollusks dredged off *Iceland* are enumerated by T. A. Verkrüzen. Ann. N. H. (4) x. pp. 371–376, and Nachr. mal. Ges. 1872, pp. 90–96.

Northern sea-shells, mostly recent species, found at the mouth of the

river Jenisei, are described and figured by Friedr. Schmidt, Mém. Pétersb. xviii. 1. pp. 48–67, pl. 4.

The abundance of animal life in the deep sea (at the coast of Norway), 200–300 fathoms, urged in 1864 by the late M. Sars in opposition to Prof. Forbes, is maintained, and several remarkable forms from thence (*Pecchiolia, Gonieolis*) described from his posthumous MSS. by his son, G. O. Sars. University-programme, Christiania, 1872, pp. vii & viii and (*Conchifera, Cephalophora*) pp. 23–40.

The mollusks found near Dröbak, in the Christiania-fjord, are enumerated by W. G. Brögger according to the depth in which they have been found, as follows :—

a. From 80 to 120 fathoms (mud), 42 species, viz. 23 Bivalves, 4 *Solenoconchia*, and 15 Gastropods; or 34 Arctic and 8 Boreal species.

b. From 70 to 40 fathoms (also mud), 131 species, viz. 2 Brachiopods, 49 Bivalves, 5 *Solenoconchia*, and 75 Gastropods; of which 64 are Arctic, 44 Boreal, and 23 Lusitanian.

c. From 40 to 10 fathoms, in the so-called "Coralline" zone *, 127 species, viz. 3 Brachiopods, 63 Bivalves, 1 *Dentalium*, and 60 Gastropods; or 47 Arctic, 48 Boreal, and 32 Lusitanian.

d. From 5–10 fathoms, in the laminarian zone, 38 species, viz. 2 Brachiopods, 18 Bivalves (no *Dentalium*), and 18 Gastropods, or 16 Arctic, 9 Boreal, and 13 Lusitanian.

Therefore in the greater depths the Bivalves and *Solenoconchia* are relatively prevalent, in the middle depths the Gastropods, and there is very regular increase of Lusitanian (southern) and decrease of northern species from beneath upwards.

Verkrüzen's 'Norwegen, seine Fjorde und Naturwunder, eine naturwissenschaftliche Reise' (Cassel: 1872, 8vo, 188 pp. 1 pl.) contains several papers on dredging, and (pp. 164–188) a complete list of the marine *Mollusca* of Norway.

31 species of sea-shells dredged in the German sea N.W. of *Heligoland* are enumerated by W. Kobelt. Nachr. mal. Ges. 1872, pp. 56–58.

Some marine mollusks observed on the German shores of the North Sea are mentioned by A. Metzger. JB. Ges. Hannov. xxi. pp. 23–26. *Lutraria elliptica* (Lam.) and *Solen siliqua* (L.), which in other localities live in shallow water, have here been found only at a depth of 20–22 fathoms.

Some new *Nudibranchia* from Brittany are described by Hesse. J. de Conch. xx. pp. 345–349.

In notes on dredgings in the "fosse du Cap Breton," P. Fischer and L. de Folin (C. R. lxxiv. p. 750, and J. Zool. i. p. 360) mention *Dentalium gracile, Nassa semistriata*, and *Lucina flexuosa* at a depth of 100–250 fathoms.

28 species of Nudibranchs, some of them new, 1 Pulmonate marine

* This term, originated by M. Sars in 1835, is taken from the sea-plant *Corallina officinalis*, not from the true Corals.—E. v. M.

(*Onchidium celticum*), and 11 Cephalopods, found on the western coast of France. P. Fischer, J. de Conch. xx. pp. 1–26 (2nd suppl. to former paper).

2. *Baltic.*

Vol. 2 of Meyer and Möbius's Fauna of the Bay of Kiel was published in 1872 (see Zool. Rec. ii. p. 235). The introduction gives an interesting account of the depths, currents, and amounts of percentage of salt in the water of the western part of the Baltic. An undercurrent of specifically heavier and more saline water is traced distinctly to the island of Bornholm; and it nourishes several marine animals which are wanting in the other parts of the same sea. The annual variations in temperature and amount of salt are rather large in the Baltic, and much larger in the eastern part of it; and to these chiefly is due the small number of living marine species (63) in that sea. Most of these species have also a large geographical distribution from the more northern shores of Europe to the Lusitanian zone, and they may be called *eurythermal*, on account of their indifference to the changes of temperature. Generally (but not always) the specimens from the Baltic are of smaller size than those from other seas; but in the bay of Kiel especially some reach a considerable size. The species described and figured from living animals, comprising the *Prosobranchia*, the *Lamellibranchia*, and a supplement to the *Opisthobranchia*, will be mentioned hereafter.

Rissoa parva (Da Costa) with its var. *interrupta* (Ad.), *R. octona* (Nilss.), and *Litorina obtusata* (L.), observed in the Baltic at the shores of Mecklenburg, by Arnold Wiechmann. Arch. Ver. Mecklenb. xxv. p. 95.

3. *Mediterranean.*

The Marquess T. A. de Monterosato has published a list of all species of shells living in the Mediterranean (including some new, but not described or figured; so that they cannot be considered as published). The author chiefly follows Jeffreys in the synonymy and discussion of the critical species; but, from a personal examination of important continental collections (besides his own), he has often had the advantage of comparison with original specimens. Some species living on the coast of Algiers and the eastern coast of Spain are excluded by him, as he thinks them rather to be Atlantic.

The "Conchigliologia vivente marina della Sicilia," published by Aradas and Benoit in 1870, contains only the Bivalves, 245 spp., the Brachiopods, 14 spp., and the Pteropods, 15 spp., with synonyms and localities, but without descriptions. A few species figured will be mentioned hereafter.

A list of the Cephalopods of the Mediterranean is extracted from the papers on the same subject by TARGIONI-TOZZETTI in 1869 (Zool. Rec. vii. pp. 117 & 129), and the diagnoses of the then new species copied. GERVAIS, J. Zool. i. pp. 193–195.

Black Sea. B. ULIANIN gives a list of 43 shelly Gastropods, 40 Bivalves, and 5 Nudibranchs, observed hitherto in the Black Sea, all of which, with two or three exceptions, are also known from the Mediterranean. Mat. Faun. Black Sea, pp. 80–88.

4. *Eastern North America.*

Out of the 282 species of marine mollusks enumerated in Gould's Report on the Invertebrata of Massachusetts, 2nd ed., J. G. JEFFREYS claims nearly one half (135) as identical with European species; viz. 50 Bivalves out of 107, all 3 Brachiopods, 79 Gastropods out of 162, 3 Heteropods and Gastropods out of 5, and not one of the 5 Cephalopods. Others are at least nearly allied to the European species. Ann. N. H. (4) x. pp. 237–247, and Rep. Br. Assoc. 1872.

Some *Mollusca* found by dredging round the island of Anticosti, Gulf of St. Lawrence, are enumerated by J. F. WHITEAVES, Ann. N. H. (4) x. pp. 348–351, and Rep. Brit. Assoc. 1872.

5. *Southern Atlantic.*

35 sea-shells from St. Helena, collected by J. C. Melliss, are enumerated by J. G. JEFFREYS, Ann. N. H. (4) ix. p. 264. Among them are 6 apparently peculiar, to which is to be added *Purpura helena* (Q. & G.) as a seventh, 3 limited to Western Africa, 7 common to Western Africa and the Mediterranean, 1 South-African, 3 Northern, 4 from the Indian Seas, and 4 of very wide distribution. MARTENS, Nachr. mal. Ges. 1872, pp. 59–61.

The few shells known from the island of *Ascension* are mentioned by MARTENS, Mal. Blätt. xix. p. 39.

The shells collected on the shores of *Tierra del Fuego*, in the *Magellan Straits*, and on the *Falkland Islands*, during the expeditions of Capt. Cook and Bougainville towards the close of the last century reviewed. *Id. ibid.* pp. 5–10 and 51–62.

6. *Red Sea.*

H. C. W. WEINKAUFF discusses the geographical distribution of the shells of the Red Sea, chiefly those dredged by M'Andrew, and comes to the conclusion that many of them have a wide area. 19 species are, according to him, also found in the Mediterranean. Nachr. malak. Ges. 1872, pp. 33–43.

16 new species of shells, collected by M'Andrew in the Red Sea, are described by H. ADAMS, P. Z. S. 1872, pp. 9–11.

General observations on sea-shells on the coral-reefs of Massowa, by C. F. JICKELI. Mal. Blätt. xx. p. 121.

7. *Indian Ocean.*

20 new species of marine shells from Ceylon, Mauritius, and Pooree, Bay of Bengal, are described by G. and H. NEVILL. J. A. S. B. xxxix. 1871, part 2. pp. 1–11, pl. 1.

17 species of sea-shells from Barren Island, Indian Sea, are enumerated by Mörch. Vid. Medd. 1872, p. 16.

8. *Australian Seas.*

The shells brought from Australia and New Zealand at the close of the last century by the expeditions of Capt. Cook are reviewed by E. v. Martens. Mal. Blätt. xix. pp. 12–31.

39 (mostly well-known Indian) species of *Cypræidæ* found on the coast of New South Wales are enumerated by J. Brazier. P. Z. S. 1872, pp. 81–86. New localities for known species of *Voluta*. *Id. ibid.* p. 23.

Several new marine species from Australia by G. Angas and J. Brazier. *Ibid.* pp. 611–613, 616, 617, pls. 42 & 44.

8 species of *Cassis* (sections *Semicassis*, *Phalium*, and *Casmaria*) observed on the coast of New S. Wales are enumerated by Brazier. P. Z. S. 1872, pp. 837 & 838.

9. *Polynesian Seas.*

The shells collected from several islands of the Pacific at the close of the last century, during the expeditions of Capt. Cook and Bougainville, are reviewed by E. v. Martens. Mal. Blätt. xix. pp. 10–12, 32–38, and 62–65.

New species, changes of names, and statements of new localities concerning marine shells of the Pacific are given by the late W. H. Pease. Am. J. Conch. vii. pp. 11–19, pls. 3–9 (Nudibranchs), 20–25, 194, 195 (very few *Chitonidæ* hitherto known from Polynesia), 198 & 199.

The descriptions of new sea-shells from *New Caledonia* are continued by Souverbie and Montrouzier, J. de Conch. xx. pp. 49–59, pl. 1, pp. 361–365; by H. Crosse, *ibid.* pp. 62–69, pl. 2, pp. 73, 74, 154–156, 218, 222, pl. 13, pp. 349, 351, pl. 16.

33 species of *Mitra*, 1 *Cylindra*, 1 *Dibaphus*, and 3 *Imbricaria* collected at Rarotonga, Cook's Islands, are enumerated by Garrett. P. Z. S. 1872, pp. 839–843.

10. *Northern Pacific.*

Japan. 18 new species of sea-shells from the Bay of Yeddo described by C. E. Lischke. Mal. Blätt. xix. pp. 100–109.

N. W. America. 60 new marine mollusks from the coasts between California and Eastern Siberia (Plover Bay) are described, and the geographical range of others ascertained, by W. H. Dall. Am. J. Conch. vii. pp. 93–169, pls. 13–16.

R. Stearns describes some new Californian shells (1 *Monoceros*, 2 *Ocinebra*), and discusses the geographical range of some species of *Monoceros*. Am. J. Conch. vii. pp. 167–173. He also describes some new shells from California and the N.W. coast of America, and corrects statements concerning the habitat of several species of *Cypræa*, *Trivia*, and *Volva* (*Ovula*) on the west coast of America: "The highest northern station on that coast at which any representative of the Cypræidæ has been detected is Bodega Head, 38° N. lat." P. Cal. Ac., Aug. and Sept. 1871.

W. H. Dall describes some new species from N.W. America, and remarks that no *Haliotis* occurs at the Aleutian Islands. *Ibid.* Oct. 1872.

24 sea-shells from Alaska enumerated (one new), and their geographical range discussed by E. v. Martens, Mat. Blätt. xix. pp. 80–99.

The shells collected on the coast of North-west America during Cook's third voyage reviewed, *id. ibid.* pp. 40–44.

Palæontology of Recent Species.

Unio sinuatus (Lam.). Pieces of the hinge-portion, used as ornaments, have been found with other antiquities, in the provinces of Nassau and Hesse, and single valves in a sort of tufa near Homburg, with old pottery ascribed to the stone age, and near Wiesbaden with Roman culinary antiquities. This species, therefore, which does not now occur in Germany, probably lived there in the prehistoric and perhaps also in the Roman age. Sandberger, Mall. Blätt. xx. pp. 95–99.

E. v. Martens mentions that this *Unio* has also been found with Roman antiquities near Mannheim, and points out its present geographical limits; he suggests that the shells alone may have been imported as ornaments in former times. SB. Nat. Fr. 1872, pp. 101–103, and Verh. Berl. Ges. Anthropol. 1872, p. 22.

Strobel, treating of the shells (chiefly of the genus *Unio*) found in prehistoric remains of human dwellings called *terremare* or *mariere* in a part of Italy, and *paraderos* in Patagonia, reviews the use made generally by mankind of bivalve shells, describing accurately the state of preservation and the circumstances in which these shells are found, and coming finally to the conclusion that in the *paraderos* of Patagonia these bivalves have been employed as food by the natives, but that in the *mariere* of Italy they either lived in the water on the spot where they have been found, or have been unconsciously transported with the earth containing them by man. Arch. Antr. Etn. ii. pt. 2, pp. 1–40; an abstract of it also in Verh. Berl. Ges. Anthropol. 1872, pp. 19–22.

Contemporaneous Changes of Fauna.

Helix aspersa (Müll.) = *spumosa* (Lowe) and *H. lactea* (Müll.), and perhaps also *H. pisana* (Müll.), *Hyalina cellaria* (Müll.), *Stenogyra decollata* (L.), and *Cyclostomus elegans* (Müll.), most probably imported from Europe to the Canaries. Mousson, Malac. Can. pp. 69–71, 29, 16, 120, 143.

Physa acuta, Drap., appears to have spread and become more common in Belgium of late years. Van der Broeck, Bull. Mal. Belg. vii. pp. xxxvii & xxxix.

Use by Man.

Instances of the use of shell-fish as food, and of shells for culinary, ornamental, or other purposes, in ancient and modern times, are reviewed by E. v. Martens, Z. Ethnol. iv. 1872, pp. 21–36 & 65–87; suppl. *id.* Verh. Berl. Ges. Anthropol. 1872, pp. 154–156. The use of bivalves discussed in a similar manner by Strobel, Arch. Antr. Etn. ii. pt. 2 (sep. print, pp. 1–5).

The present condition of the fisheries for *Pinna muricata* [?], the byssus of which is sometimes employed for weaving, and for *Cardium tuberculatum* and *Tapes decussata* at S. Antioco, Sardinia, the breeding of mussels and oysters at Tarento, and the failure of oyster-breeding in the once renowned Lake

Lucrino, are treated in the official report on fishery to the Minister of Agriculture, by Targioni-Tozzetti. Genoa: pp. 7, 8, 38–53, and 63.

R. Garner treats shortly of the pearls of the freshwater shell *Alasmodon* [*Margaritana*] *margaritifera* in Great Britain; he proposes to introduce pearls of *Mytilus* into the living *Alasmodon* to improve them, and also to wash the pearls of the latter in a dilute solution of potassium. J. L. S. xi. pp. 426–428.

CEPHALOPODA.

DIBRANCHIA.

Argonauta pacifica (Dall, Am. Nat. iii. 1869, p. 237) perhaps=Reeve's figure 2*c*, maintained as a distinct Californian species by Dall, Am. J. Conch. vii. p. 95.

Argonauta expansa, sp. n., Dall, P. Cal. Ac., Dec. 1872, Gulf of California.

Eledone not very rare on the coast of South Devon, and *Sepia officinalis* observed *in copulâ*, by Spence Bate, 4th Rep. on the Fauna of South Devon. Q. J. Micr. Soc. (2) xii. p. 403.

*Sepia fillioux*i and *fischeri* (Lafont) described by P. Fischer, J. de Conch. xx. pp. 19 & 20, Arcachon; for the first Férussac and D'Orb. Ceph. pl. 2. figs. 1–3, are cited.

Loliga vulgaris (Lam.), *affinis*, *microcephala*, *moulinsi*, *macrophthalma* (Lafont), *forbesi* (Steenstrup), and *pulchra* (Blainv.)=*bertheloti* (Fischer, J. de Conch. 1869), all from the oceanic coast of France, comparatively described by Lafont, J. de Conch. xx. pp. 21–25.

Loliolus steenstrupi, sp. n., Dall, Am. J. Conch. vii. (1871), p. 97, Gulf of California.

Onychoteuthis? lobipennis, sp. n., *id. ibid.*, p. 96; off S. Francisco.

Ommastrephes crassus (Lafont) described and compared with *O. sagittatus* (Lam.), Lafont, *l. c.* pp. 25 & 26, Western France.

TETRABRANCHIA.

Hyatt's elaborate paper on the embryology of the fossil Cephalopods (Bull. Mus. C. Z. iii. no. 5) contains valuable information concerning the first whorls, septa, and layers of the shell of the recent *Nautilus*, compared with the oldest fossil species of the same genus, *Goniatites*, *Ammonites*, &c.

H. Woodward compares the chambered structure of *Nautilus* with the void spaces found almost regularly between the layers of the inside of some oysters. Brit. Assoc. Rep. 1870, pp. 128 & 129.

PTEROPODA.

Cleodora occidentalis, sp. n., Dall, *l. c.* p. 140, North Pacific, lat. 33° N.

Corolla, g. n. (*Cymbuliidæ*), *id. ibid.* pp. 137 & 138. Pinnæ forming a single disk with reticulated muscular bands, separated by a deep sinus from the oral portion. Œsophagus produced, oral aperture trumpet-shaped, produced into two points. Shell entirely absent.—*C. spectabilis*, sp. n., *id. l. c.*, North Pacific Ocean, lat. 42° N., pelagic.

Limacina pacifica, sp. n., *id. l. c.* p. 138, Monterey.

Planorbella, g. n. (shortly characterized), W. Gabb, P. Ac. Philad. iii. p. 270, pl. 11. fig. 2.

Clione elegantissima, sp. n., Dall, *l. c.* p. 139, Pacific, lat. 51° N.

Pneumodermon pacificum, sp. n., *id. ibid.*, North Pacific, lat. 37° N.

HETEROPODA.

Recluzia. Helix johni (Chemnitz, Conch. Cab. xi. figs. 1076 & 1077) is identified with a new species of this genus, which is described as *R. johni* by Dr. Jousseaume, R. Z. (2) xxiii. p. 205.

Recluzia montrouzieri, sp. n., Souverbie, J. de Conch. xx. p. 57, pl. 1. fig. 8, Art Island, New Caledonia.

GASTROPODA.

PECTINIBRANCHIA.

PROBOSCIDIFERA RHACHIGLOSSA.

MURICIDÆ.

Murex rossiteri, pp. 74 & 218, pl. 13. fig. 2, Lifou Island, Loyalty Isles; *thomasi*, p. 212, Nukahiwa, Marquesas: Crosse, J. de Conch. xx.; spp. nn.

Ocinebra lurida (Midd.), dentition, Dall, Am. J. Conch. vii. pl. 13. fig. 1; *O. gracillima* and *circumtexta*, spp. nn., Stearns, Conchol. Memoranda, vi. 1871, and Am. J. Conch. vii. p. 172, pl. 14. figs. 15 & 14, S. Diego and Monterey, California.—N.B. The numbers marked on the plate do not agree with those quoted in the text.

Muricilla, g. n., previously characterized by W. Gabb, P. Ac. Philad. iii. p. 270, pl. 11. fig. 3.

PURPURIDÆ.

Purpura distinguenda (Dunker)=*savignii* (Desh.)=*hippocastanum* (Lam.), var. Pease, Am. J. Conch. vii. p. 23.

Purpura crispata (Chemn.), dentition: Dall, Am. J. Conch. vii. pl. 13. fig. 3.

Purpura lima (Martyn)=*saxicola* (Valenc.)=*attenuata* (Reeve)=*freycineti* (Middendorff, *nec* Desh.), from Alaska; the allied species of the west coast of America reviewed by E. v. Martens, Mal. Blätt. xix. pp. 86–88.

Purpurella, subg. n. for *Purpura columellaris* (Lam.), distinguished by the contracted aperture and one or more spiral ridges on the columella. Dall, Am. J. Conch. vii. p. 110.

Purpura (*Coralliophila*) *turris*, sp. n., Mörch, J. de Conch. xx. p. 129, pl. 5. fig. 4, probably from east coast of South America.

Pseudomurex (Jeffr. ?), generic name for *Murex bracteatus* (Brocchi)=*lamellosus* (Jan, Philippi) and allied species, which, judging only from the shell, may be placed in *Coralliophila*; no definition given. Monterosato, Conch. Mediterr. p. 48.

Monoceros paucilirata, sp. n., Stearns, Conchol. Memoranda, vi., & Am. J.

Conch. vii. p. 167, pl. 14. fig. 16, Coronado Islands, off S. Diego, California; for critical remarks concerning the geographical range of other species of the same genus, *cf.* pp. 168–171.

Chorus belcheri (Hinds), dentition, Dall, *l. c.* pl. 13. fig. 4.

Leptoconchus robillardi (Liénard), G. & H. Nevill, J. A. S. B. xxxix. pt. 2, p. 5, pl. 1. fig. 1, Mauritius.

Buccinidæ.

[*Neptunea*] *Fusus antiquus* (L.), from Kiel, where it is rare. Meyer & Möbius, Fauna der Kieler Bucht, ii. pp. 57–59, pl. 9. figs. 8–10.

Neptunea lirata (Martyn) = *Tritonium* 10-*costatum* (Middend. *nec* Say), from Alaska: Martens, Mal. Blätt. xix. pp. 82–84; and Dall, Am. J. Conch. vii. pp. 108–110 (*Chrysodomus*).—*N. castanea* (Mörch) from Alaska, Martens, *l. c.* p. 84.

Fusus (*Chrysodomus*?) *harfordi*, sp. n., Stearns, Conch. Mem. vii., coast of Mendocino County, California.

Fusus benzoni, sp. n., Mörch, J. de Conch. xx. p. 130, pl. 5. fig. 5, Brazil, probably Bahia. Resembles the genus *Atractodon* (Ag.).

Ptychatractus occidentalis, sp. n., Stearns, *l. c.*, Shumagin Islands, N.W. America.

Buccinum undatum (L.), var. with thin shell, from Kiel: Meyer & Möbius, *l. c.* pp. 49–52, pl. 9. figs. 1–7. Var. n. *planum*, Verkrüzen, Nachr. mal. Ges. 1872, p. 95, Iceland, near the shore, in a depth of 1–4 feet at low tide.

Buccinum rombergi (Dunker), from Alaska: Martens, Mal. Blätt. xix. p. 84.

B. leucostoma, sp. n., Lischke, Mal. Blätt. xix. p. 101, Bay of Yeddo (allied to *B. terræ-novæ*, Beck).

Buccinum kennicotti, Unalaska, and *fischerianum*, St.-George Island, Behring Sea, spp. nn., the latter precisely of the form of *Volutharpa*, but differing in its non-canaliculated suture, solid texture, and coloration. Dall, Am. J. Conch. vii. pp. 108 & 107, pl. 15. fig. 1, & pl. 16. fig. 13.—The first transferred to the genus *Fusus* (*Chrysodomus*?): *id.* P. Cal. Ac., Oct. 1872.

Volutharpa ampullacea (Midd.) = *deshayesiana* (Fischer) and *perrii* (Jay), reviewed, and a new var. of the former (*acuminata*) added; *V. marchiana* (Fischer) removed to *Buccinum*; ovicapsules and operculum of the first species described, the latter organ only found in about 15 out of 100 specimens. Dall, Am. J. Conch. vii. pp. 104–106, pl. 14. fig. 4 (operculum), and pl. 16. fig. 8 (shell).

Tritonidea australis, sp. n., distinct from *assimilis* (Reeve), with which it has been confounded by Angas. Pease, Am. J. Conch. vii. p. 21, Australia.

Tritonidea petterdi, sp. n., Brazier, P. Z. S. 1872, p. 22, Tasmania.

Ectracheliza, g. n., previously characterized by W. Gabb, P. Ac. Philad. iii. p. 271, pl. 9. fig. 2.

Nassidæ.

Nassa reticulata (L.), from Kiel, Meyer and Möbius, *l. c.* pp. 53–56, pl. 7. figs. 1–13.—Some notes on its development by W. Salensky, Z. wiss. Zool. xxii. p. 288, pl. 36. figs. 16–19.

Nassa intermedia (Dunker) = *suturalis* (Lam.), var.: Pease, *l. c.* p. 23.

Nassa eximia, sp. n., H. Adams, P. Z. S. 1872, p. 14, pl. 3. fig. 28, New Hebrides.

Olividæ.

Plochelæa, g. n., previously characterized by W. Gabb, P. Ac. Philad. iii. p. 271, pl. 11. fig. 5.

Turbinellidæ.

Turbinella subnassatula, sp. n., Souverbie, J. de Conch. xx. p. 50, Art Island, New Caledonia.

Volutidæ.

Voluta cymbium (Linn.) = *papillatum* (Schumacher) = *olla* (auctt., *nec* Linn.): Kobelt, Nachr. mal. Ges. 1872, pp. 74 & 75. [Hanley has proved, from the Linnæan collection, that *Cymbium porcinum*, auctt., is the real type of *Voluta cymbium*, Linn., and that *V. olla*, Linn., is probably *Cymbium neptuni*. The locality "*in mari Iberico*," on which Kobelt insists for his identification, is taken from Buonanni (Recr. tab. 6), quoted by Linnæus, and should not have the same weight as the indication of localities for which Linnæus cites no preceding author.]

Voluta (*Aulica*) *hargravesi*, sp. n., Angas, P. Z. S. 1872, p. 613, pl. 42. fig. 13, locality unknown.

Voluta (*Scaphella*) *stearnsi*, sp. n., Dall, P. Cal. Ac., Oct. 1872, Unalaska.

Mitridæ.

Mitra carinilirata (Souverbie, 1871) fully described by Souverbie, J. de Conch. xx. p. 49, pl. 1. fig. 1, New Caledonia.

M. texturata (Lam.), var. n. *lifouana*, Crosse, J. de Conch. xx. pp. 74 & 219, pl. 13. fig. 5, Lifou Island, Loyalty group.

Mitra assimilis, *fratercula*, *luteofusca*, *exquisita*, and *zebrina*, Garrett, P. Z. S. 1872, pp. 841–843 [1873], Polynesian Islands: spp. nn.

Turricula (*Costellaria*) *pharaonis* and *T.* (*Thala*) *casta*, sp. n., H. Adams, P. Z. S. 1872, p. 9, pl. 3. figs. 1 & 2, Red Sea.

Mitroidea (Pease, 1865) = *Mauritia* (A. Adams, 1869), Pease, Am. J. Conch. vii. p. 23.

Dibaphus edentulus (Swains.). The living animal, agreeing with that of *Cylindra*, has been observed by A. Garrett, P. Z. S. 1872, p. 843.

Columbellidæ.

Columbella maculosa, sp. n., distinct from *C. dermestoides* (Lam., Kien.), which is Mediterranean, and also from *C. dermestoides* (Reeve's Conch. Ic.), which is West-Indian. Pease, Am. J. Conch. vii. pp. 20 & 21, Australia.—*C. miser*[*a*] (Sow., 1844) = *pacifica* (Gaskoin, 1851). *Id. ibid.* p. 24.

Nitidella cribraria (Lam.) and *gouldi* (Carpenter): operculum. Dall, Am. J. Conch. vii. p. 115, pl. 14. figs. 1 & 5.

Astyris (H. & A. Adams) as a distinct genus; operculum like that of *Nitidella*; nucleus somewhat more within the margin. *A. carinata* (Hinds, 1844, as *Columbella*), with the varieties *gausapata* (Gould, 1850), *californiana* (Gaskoin, 1851), and *hindsi* (Reeve); *A. tuberosa* (Carpenter); *A. aurantiaca*, sp. n., from Monterey. *Id. ibid.* pp. 114–116, pl. 15. fig. 13, shell, pl. 14. fig. 3, operculum.

Amphissa (H. & A. Adams, as subgenus of *Cominella*) elevated to a distinct genus in the family *Columbellidæ*, on account of the type of the radula, and the two species, *corrugata* (Reeve, as *Buccinum*), from Sitka, and *versicolor*, sp. n., from Monterey, comparatively described. Operculum similar to that of *Buccinum undatum* (L.), but with a straight spur of callus extended towards the centre. *Id. ibid.* pp. 111–114, pl. 16. figs. 9–11, shells, pl. 13. fig. 2, and pl. 14. fig. 2, opercula.

Seminella, see *Zafra* (*Pleurotomidæ*).

Marginellidæ.

Marginella glabella (L.), *irrorata* (Menke), *amygdala* (Kien.), *persicula* (L.), and *limbata* (Lam.) found on the coast of Western Africa, at the bank of Arguin, lat. 20° N. Crosse, J. de Conch. xx. pp. 215–217.

Marginella calameli, sp. n., Jousseaume, R. Z. (2) xxiii. p. 202, pl. 18. fig. 3, Djigeelli, Algeria; near *triticea* (Phil.).

Marginella lifouana (Crosse, 1871) fully described by Crosse, J. de Conch. xx. p. 93, pl. 2. f. 2, Lifoo Island, Loyalty group, near New Caledonia.

Marginella debilis, new name for *oryza* (Pease, 1860), which is preoccupied, and distinct from *australis* (Hinds). Pease, Am. J. Conch. vii. p. 22.

Persicula dubiosa, sp. n., Dall, Am. J. Conch. vii. p. 103, pl. 15. fig. 17, Acapulco.

Proboscidifera tænioglossa.

Cassididæ and Ranellidæ.

Cassis pfeifferi (Hidalgo, 1871), Hidalgo, J. de Conch. xx. p. 143, pl. 7. f. 2, Philippines?

Cassis nivea, West Tasmania, and *C. sophia*, N. S. Wales, spp. nn., Brazier, P. Z. S. 1872, pp. 616 & 617, pl. 44. figs. 1 & 2.

Dolium melanostomum (Jay) lives on the small islands to the west of the Hawaiian group. Pease, Am. J. Conch. vii. p. 24.

Triton (*Epidromus*) *coxi*, sp. n., Brazier, P. Z. S. 1872, p. 22, pl. 4. fig. 9, New S. Wales.

Tritonium oregonense (Redfield), from Alaska, distinct from *cancellatum* (Lam.). The flesh is said to be noxious. Martens, Mal. Blätt. xix. pp. 80–82.

Cypræidæ.

Cypræa coxi, sp. n., Brazier, P. Z. S. 1872, p. 617, pl. 44. fig. 3, Dupuch Island, N.W. Australia.

Cypræa petitiana, sp. n., = *nebulosa* (Sow. Thes. figs. 354 & 355, *nec* Kiener), from the Gaboon and Senegal. Crosse, J. de Conch. xx. p. 213.

Luponia sowerbii (Kien.) is found in the Gulf of California, *spadicea* (Swains.) at S. Barbara and S. Diego, Upper California. Stearns, P. Cal. Ac. Sept. 1871 (p. 2).

Trivia californica (Gray). Soft parts described by Stearns. Dall, Am. J. Conch. vii. p. 122.

Trivia depauperata (Sow.) founded on worn specimens of *T. californica*. Stearns, Am. Nat. v., Nov. 1871.

LAMELLARIIDÆ.

Lamellaria stearnsi, sp. n., var. n.? *orbiculata*, and *L. rhombica*, sp. n., Dall, Am. J. Conch. vii. pp. 122 & 123, pl. 15. figs. 6, 2 & 3, & 4 & 5, Monterey, California. The larval shells, *Echinospira* (Krohn) = *Helicophlegma* (Orb.), have also been observed.

VELUTINIDÆ.

Velutina haliotoidea (O. Fabr.), from Kiel. Meyer & Möbius, Fauna &c. ii. pp. 40–42, pl. 7. figs. 14–18.

Velutina cryptospira (Middend.) observed at Unalaska, St. Paul's Island, and Norton Sound. Dall, Am. J. Conch. vii. p. 123.

NATICIDÆ.

Amauropsis? purpurea, sp. n., Dall, Am. J. Conch. vii. p. 124, pl. 15. fig. 16, Norton Sound, Alaska Territory.

Colobocephalus, sp. n.?, certainly distinct from *Natica smithi* (Brown), found by Bröggers in the fjord of Christiania. Bidr. Kristianiaf. moll. faun. p. 38.

Sigaretus undulatus and *japonicus*, spp. nn., Lischke, Mal. Blätt. xix. pp. 103 & 106, Bay of Yeddo.

? *Robinsonia* (Nevill, P. Ceyl. As. Soc. 1869). Shell thin, with a few rapidly increasing whorls, not umbilicated; columella simple.—*R. ceylonica* and *pusilla* (Nevill, *loc. cit.*); G. & H. Nevill, J. A. S. B. xxxix. p. 34, pl. 1. figs. 5 & 6, Ceylon.

PROBOSCIDIFERA GYMNOGLOSSA.

PYRAMIDELLIDÆ.

Obeliscus tenuisculptus, sp. n., Lischke, Mal. Blätt. xix. p. 102, Bay of Yeddo; belongs to *Syrnola* (A. Ad.).

Syrnola dubiosa, sp. n., G. & H. Nevill, J. A. S. B. xxxix. part 2, 1871, p. 5, pl. 1. fig. 19, Pooree, Bay of Bengal.

Monoptygma eximium, sp. n., Lischke, Mal. Blätt. xix. p. 103, Bay of Yeddo.

Odostomia rissoides (Hanley), from Kiel. Meyer & Möbius, *l. c.* ii. pp. 65 & 66, pl. 3. figs. 7–13. Shell, living animal, operculum, and embryonal shell figured.

Odostomia beringi, sp. n., Dall, Am. J. Conch. vii. p. 117, Norton Sound, Alaska Territory.

EULIMIDÆ.

Niso pyramidelloides, sp. n., G. & H. Nevill, J. A. S. B. xxxix. part 2, p. 5, pl. 1. fig. 14, Bay of Bengal and peninsula of Malacca.

Niso trilineata, sp. n., Mörch, J. de Conch. xx. p. 129, probably from Guinea; = *N. pyramidelloides* (Nevill), var. n., named *imbricata*, and the locality called in doubt: *id. ibid.* p. 345.

Eulima porcellana, sp. n., H. Adams, P. Z. S. 1872, p. 15, pl. 3. fig. 29, New Hebrides.

Liostraca montrouzieri, sp. n., Souverbie, J. de Conch. xx. p. 365, Art Island, New Caledonia.

Iopsis, g. n., prevjously characterized by W. Gabb, P. Ac. Philad. iii. p. 272, pl. 11. fig. 6.

Stiliferidæ.

Stilifer corallinus (Chemn.) described by Jousseaume, R. Z. (2) xxiii. p. 206.

Toxifera.

Conidæ.

The different qualities of the cuticle (epidermis) in *Conus* (membranaceous, tomentose, spirally ridged, or even produced into single tufts in *C. tulipa*) discussed by E. v. Martens, Nachr. mal. Ges. 1872, pp. 62 & 63.

Conus vayssetianus, sp. n., and *suffusus* (Sow.), Crosse, J. de Conch. xx. pp. 154 & 155 and 350 & 351, pl. 16. figs. 1 & 2, New Caledonia.

C. fulvocinctus, sp. n., Crosse, *ibid.* p. 214, Western Africa.

Conus bayani and *baylii*, spp. nn., Jousseaume, R. Z. (2) xxiii. pp. 200 & 198, pl. 18. figs. 1 & 2; the first probably from Bourbon Island.

Leptoconus (*Phasmoconus*) *dusaveli*, sp. n., H. Adams, P. Z. S. 1872, p. 12, pl. 3. fig. 17, Mauritius.

Conus sinensis and *ocellatus* (Gmel.) probably founded on artificially coloured specimens. E. v. Martens, SB. nat. Fr. 1872, p. 104.

Pleurotomidæ.

Pleurotoma mariei (Crosse, 1869) fully described by Crosse, J. de Conch. xx. p. 67, pl. 2. f. 5, Noumea, New Caledonia.

Pleurotoma luehdorfi and *kaderlii*, spp. nn., Lischke, Mal. Blätt. xix. p. 100, Bay of Yeddo.

Pleurotoma rugosa (Mighels, 1845)=*scalarina* (Desh. 1863), from Bourbon to the Hawaiian Islands. Pease, Am. J. Conch. vii. p. 24.

Pleurotoma (*Drillia*) *montereyensis*, Monterey, and *hemphilli*, Todos-Santos Bay, spp. nn., Stearns, Conchолog. Memoranda, vii., California.

Drillia kennicotti, sp. n., Dall, Am. J. Conch. vii. p. 102, pl. 16. f. 2, Unga Island, Shumagin group, Alaska.

[*Bela*] *Pleurotoma turricula* (Mont.) found at Kiel (only dead shells). Meyer & Möbius, *l. c.* ii. pp. 60 & 61, pl. 7. fig. 19.

Bela ? *lævigata*, sp. n., Dall, *l. c.* p. 98, pl. 16. fig. 7, Norton Sound, Alaska Territory.

Clathurella rubroguttata and *pulcherrima*, spp. nn., H. Adams, P. Z. S. 1872, p. 14, pl. 3. figs. 25 & 26, New Hebrides.

Pleurotoma (*Clathurella*) *roseotincta* and *P.* (*Defrancia*) *nigrotincta*, spp. nn., Montrouzier, J. de Conch. xx. pp. 361 & 362, Art Island, New Caledonia.

Clathurella canfieldi and *affinis*, spp. nn., Dall, *l. c.* pp. 101 & 102 (the first, pl. 15. fig. 9), California.

Cithara richardi and *delacouriana* (Crosse, 1869) fully described by H. Crosse, J. de Conch. xx. pp. 65 & 66, pl. 2. f. 3 & 4, Noumea, New Caledonia.

Pleurotoma (*Cithara*) *guesteri* and *biclathrata*, spp. nn., Souverbie, J. de Conch. xx. pp. 362 & 363, Art Island, New Caledonia.

Daphnella? *bella* (Pease, 1860) = *Pleurotoma gemmulata* (Desh. 1863). Pease, Am. J. Conch. vii. p. 25.

D. fuscoligata, sp. n., Dall, *l. c.* p. 100, Monterey.

Mangelia bicinctula, sp. n., G. & H. Nevill, J. A. S. B. xxxix. part 2, p. 6, pl. 1. fig. 15, Ceylon.

Mangelia aleutica and ? *alaskensis*, Unga Island, Shumagin group; *M. funebrale*[*-is*], Sitka, spp. nn.: Dall, *l. c.* pp. 98–100.

Zafra pupoidea, sp. n., H. Adams, P. Z. S. 1872, p. 14, pl. 3. fig. 27, New Hebrides. *Seminella*, Pease, = *Zafra*, H. Adams (Ann. N. H. 1860): *id. ibid.*

Glyphostoma, g. n., previously characterized by W. Gabb, P. Ac. Philad. iii. p. 270, pl. 11. fig. 4.

Terebridæ.

Terebra contigua, new name for *assimilis* (Pease, 1860), which is preoccupied. Pease, Am. J. Conch. vii. p. 20.

Rostrifera tænioglossa.

Strombidæ.

Pterocera (*Heptadactylus*) *sowerbii*, sp. n., Mörch, J. de Conch. xx. p. 131, Tahiti.—*P.* (*H.*) *sebæ* (Val.), Red Sea, and *P.* (*H.*) *truncata* (Humphrey, Lam.), both confounded by Chemnitz and Gmelin under the name *bryoniæ*, are distinguished from it: *id. ibid.* pp. 131–133.

Orthaulax and *Dolophanes*, gg. nn., previously characterized by W. Gabb, P. Ac. Philad. iii. pp. 272 & 273, pl. 9. figs. 3 & 4, and pl. 11. fig. 7.

Phoridæ.

Xenophora lamberti (Souverbie, 1871) fully described by Souverbie, J. de Conch. xx. p. 54, pl. 1. fig. 5, New Caledonia.

Ovulidæ.

Ovula caledonica (Crosse, 1871) fully described by Crosse, J. de Conch. x. p. 62, pl. 2. f. 1, New Caledonia. None of the 5 species mentioned in Reeve's monograph as from New Caledonia have hitherto been sent thence by the French collectors.

Amphiperas ovoideus, sp. n., H. Adams, P. Z. S. 1872, p. 10, pl. 3. fig. 4, Red Sea.

Trichotropiidæ.

Trichotropis bicarinata (Sow.). Typical form and varr. nn. ? *alta* and *spectabilis*, from Plover Bay, East Siberia, described by Dall, Am. J. Conch. vii. pp. 119–121.

Iphinoe permabilis [*peramabilis*?], sp. n., *id. ibid.* p. 119, Unga Island Shumagin group, Alaska.

Pediculariidæ.

Pedicularia japonica, sp. n., *id. l. c.* p. 121, pl. 16. fig. 12, Nippon, 60 fathoms, on *Gorgonia*.

Cerithiidæ.

Cerithium reticulatum (Dacosta), from Kiel: Meyer & Mobius, Fauna &c. ii. pp. 43–45, pl. 8. figs. 1–6. *C. lima* (Brug.) [=*reticulatum* (Dacosta)]; its variability is urged, and *C. ferrugineum* (Brug.), *afrum* (Sandri), and *elongatum* (Sow.) are to be united with it: H. C. Weinkauff, Nachr. mal. Ges. 1872, pp. 41 & 42.

Cerithiolum, new (?) generic name for the same species,=*Bittium* (Leach). Monterosato, Conch. Medit. p. 46; the author meaning [wrongly] that the latter is preoccupied among the *Crustacea*.

Cerithium janthinum (Gould, 1849)=*aspersum* (Desh., 1863). Pease, Am. J. Conch. vii. p. 25.

Triforis perversa (L.), from Kiel: Meyer & Möbius, *l. c.* ii. pp. 46–48, pl. 8. figs. 7–14. The radula, figs. 13 & 14, contains about 26 transverse short denticulated plates, and is therefore very different from that of *Cerithium* and of the *Tænioglossa* generally.

Triforis incisus[*-a*] (Pease, 1860)=*triliratus*[*-a*] (Desh., 1863). Pease, *l. c.* p. 25.

Melaniidæ.

Paludomus grandidieri, sp. n., Crosse & Fischer, J. de Conch. xx. p. 209, Madagascar.

Philopotamis violacea and *regalis* (Layard)=*Melania setosa* (Q. & G., Voy. Astrol.), A. Brot, Mat. fam. Mélaniens, iii. pp. 54 & 55, pl. 3. figs. 16 & 15, Ceylon.

Melania amarula (L.). The species allied to and often confounded with it are thus arranged:—1. *amara* (Mörch)=*mitra* (Reeve, Conch. Ic. f. 175), Sumatra and Nicobar Islands, the largest species; 2. *amarula* (L.), Amboyna; 3. *crenularis* (Desh.); 4. "*melanus*" (Montf.), Mauritius and Bourbon; 5. *coacta* (Meuschen)=*thiarella* (Lam.), locality unknown; 6. *mitra* (Meuschen). Mörch, J. de Conch. xx. pp. 319–321.

Melania truncata, thiarella, granifera, decollata, asperata, carinifera, lævigata, coarctata, corrugata, subulata, truncatula, punctata, spinulosa, and *clavus* (Lam.), *amarula* (L.), and *fasciolata* (Olivier), figured from Lamarck's original specimens by A. Brot, *l. c.* pl. 1. figs. 1–17; the descriptions of Lamarck copied and accompanied by notes, pp. 7–23.

Melania sinensis (Reeve), var. *minor, fœda* (Lea), *asperata* (Lam.), var., *irawadica* (Blanf.), *macilenta* (Menke), *cuspidata* (Menke), *plicatilis* (Mouss.), Ovalau; *moluccensis* (Quoy), *papuensis* (Quoy), *lirata* (Beus.), var., *psorica* (Morelet), *pagoda* (Lea, var.), *cochlea* (Lea), described and figured. *Id. l. c.* pp. 31–48, pl. 3. figs. 1–14, pl. 4. figs. 2–13.

Melania helleri (Parr. in sched.), Central America, *chrysalis*, Tehuantepec, *radix*, Central America, *hainanensis*, Hainan, *angulifera*, Java, *zelebori*, Nicobar Islands, *acicula*, Labuan, *lepida*, Madagascar, *labuanensis*, Labuan, *oahuensis* (Pease, MS.), *subspinulosa*, Zanzibar, *chenui, turris, herbacea*, and *ciliata*, localities unknown: spp. nn. *Id. l. c.* pp. 29–49, pl. 2. figs. 3–16, pl. 3. figs. 2, 8, 9, 11, pl. 4. fig. 1.

Melania (*Melanella*) *brevicula* (H. Adams), *id. l. c.* p. 28, pl. 4. fig. 8.

M. (*Pachychilus*) *ærstedti*, Mörch, *id. l. c.* p. 29, pl. 4. fig. 1.

M. (*Doryssa*) *lamarckiana* (Brot)=*atra* of the works of Reeve and Phi-

lippi, from Guiana, *inconspicua* and *capillaris*, spp. nn., the first from Brazil, the latter from South America. *Id. l. c.* pp. 49–51, pl. 3. fig. 17, pl. 4. figs. 14 & 15.

G. W. Tryon opposes J. Lewis's identifications of several described species of *Anculosa*, *Lithasia*, *Somatogyrus*, *Strephobasis*, and *Tympanostoma*. Am. J. Conch. vii. pp. 86–88.

Melanoides spinata and *hanleyi*, spp. nn., Godwin-Austen, P. Z. S. 1872, p. 514, pl. 30. figs. 1 & 2, Cachar Hills, N.E. Bengal.

Hemisinus gealii, sp. n., Brot, *l. c.* p. 53, pl. 4. fig. 7, New Granada.

Melanopsis lamberti, sp. n., Souverbie, J. de Conch. xx. p. 148, New Caledonia.

Pirena tenebralis, *spinosa*, *aurita*, and *granulosa* (Lam.). Critical notes concerning Lamarck's original specimens: Brot, *l. c.* pp. 23–26; the last figured, pl. 1. fig. 18.

P. (*Melanatria*) *lamarci*, sp. n., *id. l. c.* p. 52, pl. 2. figs. 1 & 2, Madagascar?

Littorinidæ.

Littorina littorea (L.), *obtusata* (L.), and *rudis* (Maton), var. *tenebrosa* (Mont.), from Kiel. Meyer & Möbius, Fauna &c. ii. pp. 10–19, pl. 2. figs. 1–5, 6–M, and pl. 3. figs. 1–6.

Littorina aleutica, sp. n., Dall, P. Cal. Ac., Oct. 1872, Aleutian Islands.

Lacuna divaricata (O. Fabr.) and *pallidula* (Dacosta), from Kiel: Meyer & Möbius, *l. c.* pp. 21–27, pl. 6. figs. 1–7 and 8–13.

Ersilia, new generic name for *Lacuna mediterranea* (Allery), not defined. Monterosato, Conchigl. Mediterr. p. 33. [Too near *Hersilia* (Philippi, Savigny, Dejean).]

Fossarus stoliczkanus and *insignis*, spp. nn., G. & H. Nevill, J. A. S. B. xxxix. 1871, part 2, pp. 4 & 5, pl. 1. figs. 10 & 9, Ceylon, the first also from Bombay.

Planaxidæ.

Planaxis. The known species enumerated, with several corrections in synonymy, and the following described from the collection of the British Museum:—*P. castaneus*, locality unknown; *hanleyi* and *similis*, Sandwich Islands; *eboreus*, St. Thomas and St. Vincent islands, W. Indies; *suturalis*, *longispira*, and *tenuis*, Chinese seas; *virgatus* and *variabilis*, Fiji Islands: spp. nn.; and *cingulatus* (Gould, *nec* A. Adams), renamed *gouldi*. E. Smith, Ann. N. H. (4) ix. pp. 37–46.—*P. punctostriatus*, sp. n., *id. l. c.* p. 355, Gulf of Suez.

Rissoidæ.

Rissoina fimbriata and *incerta*, spp. nn., Souverbie, J. de Conch. xx. pp. 51 & 53, pl. 1. figs. 3 & 4, Art Island, New Caledonia.—*R. artensis* (Montrouzier, MS.) and *subconcinna*, spp. nn., *id. ibid.* pp. 364 & 365, Art Island.

Rissoina angasi, new name for *R. turricula* (Angas), which is preoccupied. Pease, Am. J. Conch. vii. p. 20.

Alvania purpurea, sp. n., Dall, *ibid.* p. 116, Monterey.

Rissoa inconspicua (Alder), *octona* (L.), and *striata* (Alder), from Kiel. Meyer & Möbius, Fauna &c. ii. pp. 28–35, pl. 5. figs. 1–8, 9–14, and pl. 6. figs. 1–5.

Hydrobia ulvæ (Pennant), from Kiel. *Id. ibid.* pp. 36–39, pl. 6. figs. 6–12.

Hydrobia canariensis, sp. n., Mousson, Malacol. Can. p. 148, allied to *ventrosa* (Montagu), Fuerteventura, Canarian Islands.

Paludestrina beccarii, sp. n., Paladilhe, in Issel's paper, Atti Soc. Ital. xv. 1 (p. 16), Stagno d'Orbetello, a lake of brackish water on the coast of Tuscany.

Hemistomia, g. n., resembling *Hydrobia* and *Rissoa*. Peristome simple, continuous, nearly free; pillar-lip thickened, oblique; operculum not known. *H. caledonica*, sp. n., Crosse, J. de Conch. xx. pp. 72 & 352, pl. 10. fig. 8, Noumea, New Caledonia. Not known whether from fresh or salt water.

Paludinidæ.

Paludina madagascariensis, sp. n., Crosse & Fischer, J. de Conch. xx. p. 210, Madagascar.

Vivipara fischeriana and *eriesi* (Morelet) figured by Mabille, R. Z. (2) xxiii. p. 50, pl. 5. figs. 1 & 2 and 3–5, both from Cambodia.

Bithynia inconspicua (Dohrn), *lutea* (Gray)=*goniostoma* (Hutt.)=*pulchella* (Küster, *nec* Bens.), *nassa* (Theob.), *iravadica* (Blanf.), *cerameopoma* (Bens.), *travancorica* (Bens.), *pulchella* (Bens.), *stenothyroides* (Dohrn), and *orcula* (Bens.). Hanley & Theobald, Conchologia Indica, pl. 37. figs. 5–10, and pl. 38. figs. 1–9, British India.

Stenothyra minima (Sow.), *deltæ*, *foveolata*, and *monilifera* (Bens.). *Id. ibid.* figs. 1–4, British India.

Valvatidæ.

Valvata. The odd thread in the branchial cavity is perhaps, morphologically, the rudiment of a second gill, but makes its first appearance in the same form as in the full-grown animal. Ganin, Z. wiss. Zool. xxii. p. 285.

Valvata? petiti, sp. n., Crosse, J. de Conch. xx. pp. 157 & 353, pl. 10. fig. 7, New Caledonia.

Ampullariidæ.

Ampullaria crosseana (Hidalgo, 1871), Hidalgo, J. de Conch. xx. p. 142, pl. 7. fig. 1, R. Amazon.

Turritellidæ.

Turritella alba, sp. n., H. Adams, P. Z. S. 1872, p. 9, pl. 3. fig. 3, Red Sea ("apparently a young shell").

Mesalia polaris (Beck)=*erosa* (Couthouy), *M. reticulata* (Möller)=*lacteola* (Carpenter), and *M. acicula* (Stimps.)=*tenuisculpta* (Carpenter), all from the North Pacific, the first two from Plover Bay, East Siberia. Operculum uniform. Dall, Am. J. Conch. vii. pp. 118 & 119.

Cæcidæ.

Cæcum vitiense and *costulatum*, spp. nn., Garrett, P. Z. S. 1872, p. 879, Viti Islands.

Vermetidæ.

The genera of this family, adopted by Mörch (P. Z. S. 1861 & 1862) are thus arranged by L. Vaillant, N. Arch. Mus. vii. pp. 181–200:—

1. *Serpulorbis* (Sassi): operculum none (subgen. *Thylacodes*) or rudimentary (subgen. *Bivonia*).

2. *Siphonium* (Gray): operculum complete; shell smooth inside. Subgenera: *Siphonium*, s. str., *Stephopoma*, *Vermiculus*, and *Spiroglyphus*.

3. *Vermetus* (Adanson): operculum complete; shell with internal plaits. Subgenera: *Vermetus*, s. str., and *Petaloconchus*.

Serpulorbis lamarcki, sp. n.; *Siphonium annularium*, new name for *Serpula annulata* (Lam., *nec* Daudin); *Vermetus roussaei* [*rousseaui*], new name for *V. sipho* (Rousseau, *nec* Lam.): *id. l. c.* pp. 181–200.

Vermetus. Notes on its development by Kowalewsky, Z. wiss. Zool. xxii. p. 289.

Calyptræidæ.

[*Trochita*] *Calyptræa chinensis* (L.). Its development described by Salensky in Trans. 3rd Meeting of Russian Naturalists at Kiew, and in Z. wiss. Zool. xxii. pp. 286–288, and pp. 428–445, pl. 35, pl. 36. figs. 11–15 & 22, pl. 37. figs. 20 & 21. He insists on the formation of the nervous centres being later than that of the otoliths, and on the presence of some provisional organs, which perish in the later course of development, such as the cephalic vesicle, analogous to the cervical vesicle of the Pulmonates, the larval heart and primordial kidneys, which are replaced at a later period by other kidneys situated in another part of the body; and he criticizes some observations made by Stephanoff in a Russian dissertation concerning the development of the same species, published in 1868.

Crepidula sitkana (Middend.) scarcely distinct from *fornicata* (L.), and *C. unguiformis* (L.), all from Alaska. Martens, Mal. Blätt. xix. pp. 88 & 89.

SCUTIBRANCHIA.

Neritidæ.

Neritina violacea (Gmel.)=*crepidularia* (Lam.), with varr. *depressa* (Bens.) and *exaltata* (Récluz), and *cornucopia* (Bens.)=*melanostoma* (Troschel)=*tourannensis* (Souleyet), both from the East Indies, described comparatively by Morelet, J. de Conch. xx. pp. 133–140.

Neritina virginea (L.) is very large in fresh water, of less size in brackish water, and quite small in the sea. Gloyne, J. de Conch. xx. p. 37.

Neritina holosericea, sp. n., Garrett, Am. J. Conch. vii. p. 219, pl. 19. fig. 1, Vanna Levu, Viti I.

Navicella aponogetonis (Vahl, 1798) redescribed by Mörch, J. de Conch. xx. p. 342, East Indies, probably coast of Coromandel.

Navicella picturata, sp. n., Garrett, *l. c.* p. 224, pl. 19. fig. 13, Viti I.

Trochidæ.

The development of 2 varr. of *Trochus varius*? from the Black Sea has been described by W. Salensky. The circular velum is here the first organ appearing; the front part of the intestine, with the mouth, comes after and somewhat behind it, as in the larvæ of the *Annelida*, and still later the foot, the shell, and the bilateral transformation of the velum; whereas in *Calyptræa*, and

apparently in other *Ctenobranchia*, the two lobes of the velum, the foot, and the cephalic vesicle make their appearance simultaneously. No other provisional organs are present in *Trochus*; and one of the varieties leaves the egg in a much more imperfect stage than the other. Z. wiss. Zool. xxii. p. 288, and pp. 445–452, pl. 37. figs. 1–10.

Jousseaume defines the genera *Tinostoma*, *Cyclostrema*, and *Skenea* in the following manner, including *Pseudorotella* (Sow.) within the first, *Adeorbis* (Wood) within the second, and *Spira* (Brown) within the last. R. Z. (2) xxiii. pp. 331–335.

Tinostoma. Pillar-lip thickened, callous, more or less covering the umbilicus.

Cyclostrema. Umbilicus widely open; whorls more or less embracing one another, angular, the upper edge of the aperture projecting much in advance of the lower [aperture very oblique].

Skenea. Umbilicus widely open; whorls round, scarcely touching each other, or even disjoined near the aperture; peristome circular, the upper edge not much projecting [aperture nearly perpendicular. This genus is certainly near *Rissoa*].

Tinostoma morelieri, Martinique, and *punctatum*, Prince's Island, W. Africa, spp. nn., Jousseaume, *l. c.* pp. 335 & 337, pl. 18. figs. 4 & 5.

Cyclostrema duplicatum, sp. n., Lischke, Mal. Blätt. xix. p. 101, Bay of Yeddo.

Cyclostrema lacteum, locality unknown, *virginiæ*, ? Madagascar, *mærchii*, Pulo Pinang, *alveolatum*, locality unknown, *calameli* and *militare*, Prince's Island, W. Africa, spp. nn.: Jousseaume, *l. c.* pp. 388–394, pl. 19. figs. 1–6.

Circulus (Jeffr. ?), generic name for *Valvata striata* (Philippi) and *Delphinula exilissima* (Philippi), allied to *Cyclostrema*, not defined. Monterosato, Conch. Medit. p. 31.

Separatista quadricarinata and *stellaris*, spp. nn., the first from Paumotu I., the latter from Samoa and Viti I. Garrett, P. Z. S. 1872, pp. 878 & 879.

Trochiscus norrisi (Sow.), dentition: Dall, Am. J. Conch. vii. pl. 13. fig. 6.

[*Euchelus*] *Trochus pauperculus*, sp. n., Lischke, Mal. Blätt. xix. p. 105, Bay of Yeddo.

Chlorostoma brunneum (Phil.), var. n. *fluctuatum*, Dall, Am. J. Conch. vii. p. 130, Monterey.

Calliostoma affine, Simoda, *palmeri*, Guaymas, and *gloriosum*, Monterey, spp. nn., *id. l. c.* pp. 125 & 127; the two former figured, pl. 15. figs. 14 & 15.

C. costatum and *canaliculatum* (Martyn). On their variations and geographical range in California, *cf. id. ibid.* p. 126.

[*Zizyphinus*] *Trochus argenteonitens* and *consors*, spp. nn., Lischke, Mal. Blätt. xix. p. 104, Bay of Yeddo.

Thalotia woodsiana, sp. n., Angas, P. Z. S. 1872, p. 611, pl. 42. figs. 4 & 5, Portland Bay, Australia.

Leptothyra (Carpenter, MS.) = *Leptonyx* (Carpenter & A. Adams, *nec* Swainson, *nec* Gray, 1836) = *Homalopoma* (Carpenter, 1864). Type *L. sanguinea* (Carp.). *L. paucicostata*, sp. n., Dall, *l. c.* p. 131, Monterey. [American conchologists persist in wrongly identifying their Californian shell with a thin

operculum with the true *Turbo sanguineus*, Linn., a Mediterranean shell with a thick shelly operculum.]

Gibbula holdsworthiana, sp. n., G. & H. Nevill, J. A. S. B. xxxix. pt. 2, p. 3, pl. 1. fig. 18, Ceylon.

Gibbula canfieldi, sp. n., Dall, *l. c.* p. 129, Monterey.

Margarita pupilla (Gould) = *calostoma* (A. Ad.) = *salmonea* and *inflata* (Carpenter), and *M. lirulata* (Carpenter) = *Gibbula optabilis, parcipicta, funiculata*, and *succincta* (Carpenter), both from North-west America. *Id. l. c.* pp. 127 & 128.

Trochus (*Margarita*) *beecheyanus*, sp. n., Martens, Mal. Blätt. xix. p. 89, Alaska.

Stomatella scitula, sp. n., H. Adams, P. Z. S. 1872, p. 10, pl. 3. fig. 5, Red Sea.

S. mariei (Crosse, 1871) fully described by Crosse, J. de Conch. xx. p. 220, pl. 13. fig. 3.

Gena caledonica (Crosse, 1871) fully described, *id. l. c.* p. 221, pl. 13. f. 4.

Pleurotomaria. A note on the living animal of a species dredged in 120 fathoms is given by L. Agassiz in the 'New York Weekly Tribune,' 14 Feb. 1872, p. 3, and repeated in Nachr. mal. Ges. 1872, pp. 55 & 56. The sides of the foot are fringed with papillæ.

Scissurella paumotuensis, sp. n., Garrett, P. Z. S. 1872, p. 878 [1873], Paumotu Islands.

Fissurellidæ.

Fissurellidea bimaculata, sp. n., Dall, Am. J. Conch. vii. p. 132, 1871, pl. 15. fig. 7, Monterey; *callomarginata* (Carp.), *id. ibid.* fig. 8.

Lucapina crenulata (Sow.) and *Fissurella volcano* (Reeve). Soft parts described, *id. ibid.* p. 134; dentition, pl. 13. figs. 7 & 8.

Rimula verrieri (Crosse, 1871) fully described by Crosse, J. de Conch. xx. p. 68, pl. 2. f. 8, Noumea, New Caledonia.

Cemoria nana, sp. n., H. Adams, P. Z. S. 1872, p. 10, pl. 3. fig. 6, Red Sea.

Emarginula rugosa and *modesta*, spp. nn., *id. ibid.* figs. 7 & 8, Red Sea.

Emarginula maculata and *montrouzieri*, spp. nn., Souverbie, J. de Conch. xx. p. 55, pl. 1. figs. 6 & 7, Art Island, New Caledonia.

CYCLOBRANCHIA.

Tecturidæ.

Tectura testudinalis (Müll.) from Kiel. Meyer & Möbius, Fauna &c. ii. pp. 7–9, pl. 1. figs. 6–9.

Tectura mitra (Esch.) = *scurra* (Middend.), from Alaska, and its differences from the Chilian *scurra* (Less.) pointed out; *T. cassis* (Esch.) compared with *deaurata* (Gmel.); *T. digitalis* (Esch.) = *oregona* (Nuttall), *T. patina* (Esch.) = *pintadina* (Gould) = *cumingi, nuttalliana*, and *verriculata* (Reeve), and *T. persona* (Esch.), including *ancylus* (Esch.), allied to the Chilian *punctata* (Gray?, Orb.), all from Alaska. Martens, Mal. Blätt. xix. pp. 91–97, pl. 3. figs. 3–10.

Acmæa (*Collisella*) *peramabilis*, sp. n., Dall, P. Cal. Ac., Dec. 1872, Shumagin Islands, Alaska.

Acmæa hamilli (Fischer, 1857), Crosse, J. de Conch. xx. p. 145, pl. 5. fig. 6.

Patellidæ.

Patella sandwicensis (Pease) distinct from *exarata* (Nuttall, Reeve). Pease, Am. J. Conch. vii. pp. 198–200.

Nacella? *rosea*, sp. n., Dall, P. Cal. Ac., Oct. 1872, Shumagin Islands, Alaska.

Chitonidæ.

Chiton marginatus (Penn.), from Kiel. Meyer & Möbius, *l. c.* pp. 3–5, pl. 1. figs. 1–5.

Acanthochites viridis and *armatus*, spp. nn., Pease, Am. J. Conch. vii. pp. 194 & 195, Hawaiian I.

TECTIBRANCHIA.

Tornatellidæ.

Ringicula minuta, sp. n., H. Adams, P. Z. S. 1872, p. 11, pl. 3. fig. 14, Red Sea.

R. apicata, sp. n., G. & H. Nevill, J. A. S. B. xxxix. part 2, p. 3, pl. 1. fig. 10, Mauritius.

Rictaxis [*Rhectaxis*], new subgenus of *Actæon*; columella projecting like a tooth beyond the line of the anterior margin. Type *R. punctocælata* (Carp. as *Tornatella*) from California. Dall, Am. J. Conch. vii. p. 136, pl. 15. fig. 12.

Actæonidea, g. n., previously characterized, W. Gabb, P. Ac. Philad. iii. p. 273, pl. 11. fig. 8.

Bullidæ.

Tornatina inconspicua, sp. n., H. Adams, P. Z. S. 1872, p. 11, pl. 3. fig. 12, Red Sea.—*T. harpa*, sp. n., Dall, *l. c.* p. 136, Monterey, adhering to the tentacula of *Actinia*.—*T. liratispira*, Rio Janeiro, and *persiana*, Persian Gulf, spp. nn., E. Smith, Ann. N. H. (4) ix. p. 354.

Cylichna lactuca and *involuta*, spp. nn., G. & H. Nevill, J. A. S. B. xxxix. part 2, pp. 2 & 3, pl. 1. figs. 2 &3, Ceylon, the latter also from Bombay and Penang.

C. minuta, sp. n., H. Adams, P. Z. S. 1872, p. 11, pl. 3. fig. 10, Red Sea.

C. nitens and *fijiensis*, Viti Islands, *propinqua*, Vancouver I., *luteocincta*, locality unknown, *pumilissima*, *consanguinea*, and *perpusilla*, Persian Gulf, (*Mnestia*) *punctosulcata*, Tunis, (*M.*) *alboguttata*, West Indies, and (*Sao*) *pellii*, Persian Gulf, spp. nn., E. Smith, *l. c.* pp. 351–354.

Cylichnella, g. n., previously characterized, W. Gabb, P. Ac. Philad. iii. p. 273, pl. 10. fig. 2.

Atys canariensis and *macandrewi*, Canaries, *angustatus* and *mirandæ*, Gulf of Suez, spp. nn., and notes concerning the synonymy of some other species. E. Smith, *l. c.* pp. 344–347.

Atys (*Alicula*) *isseli*, sp. n., H. Adams, *l. c.* p. 11, pl. 3. fig. 13, Red Sea.

Amphisphyra hyaluia (Turt.), a dead shell found near Kiel. Meyer & Möbius, Fauna &c. ii. p. 67, pl. 10. figs. 8 & 9.

Haminea sericea, *malleata* and *perplexa*, localities unknown, *cuticulifera*, New Zealand and Port Jackson, *æquistriata* and *rugosa*, Gulf of Suez, spp. nn., and notes concerning some known species, E. Smith, *l. c.* pp. 347–351.

Utriculopsis vitrea (Sars). Brögger doubts Jeffreys's identification of this species with *Utriculus globosus* (Lovén). Bidr. Krist. moll. faun. p. 40.

Glauconella andersoni, sp. n., G. & H. Nevill, J. A. S. B. xxxix. pt. 2, p. 2, pl. 1. fig. 13, Ceylon and Penang.

Philine japonica, sp. n., Lischke, Mal. Blätt. xix. p. 104, Bay of Yeddo.

Phyline [*Philine*] *erythræa*, sp. n., H. Adams, *l. c.* p. 11, pl. 3. fig. 11, Red Sea; plates of the gizzard deeply serrated, fig. 11 *a*.

Lophocercidæ.

Oxynoe hargravesi, sp. n., H. Adams, *l. c.* p. 15, pl. 3. fig. 30, New Hebrides.

Aplysiidæ.

Aplysia sorex (Rang) from Madeira. Mörch, Vid. Medd. 1872, p. 13.

Phyllaplysia, g. n. Body flat, neck short, foot broad, natatory lobes small. Shell not ascertained, either absent or horny. Teeth of radula tricuspid, blunt. Copulation reciprocal, as in *Helix*, not in multiple chains, as in true *Aplysiæ*. To this genus belong *Aplysia depressa* (Cantr.), *Dolabella ornata* (Desh.), both from the Mediterranean, and *P. lafonti*, sp. n., found at Arcachon among sea-grass. P. Fischer, J. de Conch. xx. pp. 295–301, pl. 15. figs. 1–3.

Aplysiella, g. n., for *Aplysia petalifera* and *unguifera* (Rang), having the natatory lobes rudimentary as in *Dolabella*, but the shell very thin. *Id. ibid.* p. 296.

Dolabrifera holbœlli, sp. n., Bergh, Verh. z.-b. Wien, xxii. pp. 437–446, pls. 5 & 6, Greenland. Anatomy described comparatively with that of *D. ascifera* (Rang) and *Aplysia punctata* (Cuv.).

Umbrellidæ.

Umbrella mediterranea (Lam.). M. G. Moquin-Tandon, discussing its anatomy, confirms the position of the auricle at the back of the heart, the hermaphroditism of the animal, and the secretion of uric acid in the so-called organ of Bojanus (pre-cordial gland), which communicates in this genus with the pericardial sac. Ann. Sc. Nat. (5) xiv. 1870, 135 pp. 8 pls.

NUDIBRANCHIA.

Doridida.

Doris repanda (Ald. & Hanc.) from Kiel. Meyer & Möbius, Fauna &c. ii. pp. 68 & 69, pl. 10. figs. 1–7.

Doris biscayensis, *seposita*, and *eubalia*, spp. nn., Fischer, J. de Conch. xx. pp. 6–11, Arcachon, S.W. France.

Doris villosa, *debilis*, *cinerosa*, and *nubilosa*, Huaheine, *compta*, Apaiang, *rubrilineata* and *sordida*, Tahiti, *fuscescens*, Maiao, spp. nn.: Pease, Am. J. Conch. vii. pp. 11–15, pl. 3. figs. 1 & 2, pl. 4. figs. 1–3, pl. 5. figs. 1 & 2, and pl. 6.

Chromodoris variegata and *maculosa*, Tahiti, *rufomaculata*, *inornata*, *lenti-*

ginosa and *varians*, Huaheine, *simplex*, Maiao, spp. nn.: *id. ibid.* pp. 15–19, pls. 7–9. The author describes the act of coiling up the spawn-ribbon by the foot, which folds at its extremity, forming a groove through which the ribbon passes.

Goniodoris elegans (Cantraine) described by P. Fischer, J. de Conch. xx. pp. 12–14, Arcachon.—*G. mariei*, sp. n., Crosse, *ibid.* pp. 73 & 153, pl. 7. fig. 5, New Caledonia.

Polycera horrida, sp. n., Hesse, *ibid.* p. 345, Brittany.

Ægirus hispidus, sp. n., *id. ibid.* p. 346, Brittany.

Triopa incisa, sp. n., M. Sars, Remark. Forms [see list of Titles], pp. 35–37, pl. 3. figs. 1–3, Lofoden Islands, Norway, 120–200 fathoms.

Tritoniidæ.

Dendronotus luteolus (Lafont) described by P. Fischer, J. de Conch. xx. pp. 14 & 15, Arcachon.

Doto uncinata, pinnigera, armoricana, aurita, styligera, confluens, and *onusta*, spp. nn., Hesse, *ibid.* pp. 347 & 348, Brittany.

Æolidiidæ.

Goniolis [*Goniæolis*], g. n. A distinct mantle-border, which gives a square form to the body. Tentacles not retractile; dorsal very large, labial placed at the side of a large velum. Dorsal papillæ simple, scattered on both sides of the back. About 20 smooth teeth in each transverse row of the radula, the median conical, stout, bent backward, with obtuse rounded extremity. —*G. typica*, sp. n., M. Sars, *l. c.* pp. 37–40, pl. 4. figs. 1–11, Christiansund and Hardangerfjord, Norway, 50–100 fathoms.

Eolis pallidula (Lafont) described by P. Fischer, J. de Conch. xx. p. 16, Arcachon.—*E. nemesis* and *armoricana*, spp. nn., Hesse, *ibid.* pp. 346 & 347, Brittany.

Hermæidæ.

Hermæa polychroma, sp. n., Hesse, *l. c.* p. 346, Brittany.

Alderia (?) *albopapillosa*, sp. n., Dall, Am. J. Conch. vii. p. 137, Sitka.

Ercolania, g. n., allied to *Stiliger* (Ehrenb.). "Corpus subcylindricum; caput parvum, velo destitutum; podarium angustum, angulis anterioribus rotundatis; branchiæ quam plurimæ, inflatæ, globulis niveis conspersæ, cæco hepatico ramoso instructæ, seriebus longitudinalibus ad latera dorsi dispositæ; rhinophoria longiora, graciliora, extra leviter canaliculata. Anus in medio dorso ante cor situs. Foramina generationis ad latus dextrum; penis fistulâ rigidâ, oblique præcisâ armatus. Hydrocardium longissimum, foramine hydrophoro ad lævum latus ani. Maxillæ corneæ desunt. Dentes radulæ validi, non denticulati, apice rotundato."—*E. pancerii*, *uziellii*, and *siettii*, spp. nn., Gulf of Genoa. Trinchese, Ann. Mus. Genov. ii. pp. 86–132, pls. 4–12, with anatomical details (extr. in J. Zool. i. p. 197, pl. 13. figs. 1–6).

Elysiidæ.

Diplopelycia, g. n. Body compressed as in *Scyllæa*; tentacles very strong, fan-shaped, festooned at the edge; no rhinophores, jaw, or eyes; dorsal lobes with several fin-like processes; underside keeled, with similar processes on

each side; tail triangular, resembling the body of *Diphyes*.—*D. trigonura*, sp. n., Mörch, J. de Conch. xx. pp. 125–128, pl. 5. figs. 1 & 2, and pl. 6. figs. 1 & 2 (J. Zool. i. pp. 198 & 199, pl. 13. figs. 7 & 8), Nice.

Phyllirrhoidæ.

Phyllirrhoe bucephala (Péron) is luminous according to Prof. Panceri: *cf.* Arch. Z. Par. i. pp. lx & lxi.

PULMONATA.

Bland & Binney, Ann. Lyc. N. York, x. pp. 158–170, review the systematic arrangement of the terrestrial *Pulmonata*, as represented in N. America, recapitulating the more recent researches into their dentition and jaw-structure. The jaw and marginal teeth are maintained, and the caudal pore abandoned, as primary characters for the distinction of subfamilies. The family *Oleacinidæ* (= *Testacellidæ*) is maintained, the *Cylindrellidæ* are abandoned, and the *Helicidæ* are divided into the following subfamilies:—

Vitrininæ. Jaw simple, marginal teeth aculeiform: *Macrocyclis, Zonites, Hyalina, Vitrina, Limax.*

Helicinæ. Jaw simple, marginal teeth quadrate: *Arion, Ariolimax, Binneia, Patula, Helix, Holospira, Cylindrella, Macroceramus, Bulimulus, Cionella, Stenogyra, Pupa, Vertigo.*

Orthalicinæ. Jaw composite: *Orthalicus, Liguus, Punctum.*

Succininæ. Jaw simple, with one upper accessory plate: *Succinea.*

Prof. C. Semper points out some mistakes in the anatomical descriptions given by Stoliczka (see Zool. Rec. viii. pp. 149 & 150), chiefly concerning what is called "flagellum" by the latter, and declares the peculiar bodies observed in *Sesara infrendens* to be spermatophores; he defends his own systematic disposition of the *Zonitidæ* (see Zool. Rec. vii. p. 150), founded on anatomical differences chiefly in the generative organs. Mal. Blätt. xix. pp. 177–183.

The respiratory orifice of *Zonites algirus* is the subject of a note by H. Sicard, C. R. lxxiv. p. 1116.

A. Döring remarks that species of the same genus living sometimes without water, or in comparatively dry spots, have the aperture of the shell smaller than those which never leave the water or live in very moist localities. Inaugural Dissertation, Göttingen, 1872.

Geophila.

Oncidiidæ.

Oncidium celticum (Cuv.). Anatomical researches by L. Vaillant, C. R. lxxiii. pp. 1172–1174; abstract in Ann. N. H. (4) x. pp. 101–104.

On *Oncidium verruculatum* (Cuv.), *cf.* H. Nevill, P. A. S. B., Dec. 1870.

Peronia vermiculata (Cuv.), *mauritiana* (Blainv.), and *marmorata* (Less.), from the Nicobars. Some remarks on their coloration taken from drawings

are given by Mörch, J. de Conch. xx. pp. 325 & 326, and Vid. Medd. xi. p. 28.

Onchidella borealis, sp. n., Dall, Am. J. Conch. vii. p. 135, Sitka.

Vaginulidæ.

Vaginula (Fér.), the known species are reviewed, and *V. brevis*, Zanzibar, *maillardi*, Bourbon, *seychellensis*, Seychelles, spp. nn., added by P. Fischer, N. Arch. Mus. vii. pp. 147–176, pl. 11: the new species also in J. de Conch. xx. pp. 144 & 145.

V. moreleti, sp. n., Crosse & Fischer, J. de Conch. xx. p. 59, Carmen and Palenque, Mexico.

Veronicella olivacea, sp. n., Stearns, P. Bost. Soc. (Oct. 1871), Nicaragua.

Agnatha (Testacellidæ).

Daudebardia heldi, sp. n., Clessin, Mal. Blätt. xix. p. 73, pl. 2. figs. 1–4, environs of Munich and Dinkelscherben, Bavaria.

[*Rhytida*] *Helix villandrii* (Gassies, 1865)=*boysi* (Angas, 1869). Brazier, P. Z. S. 1872, p. 805.

Diplomphalus, g. n., for *Helix cabriti*, which has the radula of the *Testacellidæ*, from New Caledonia. Crosse & Fischer, J. de Conch. xx. p. 288.

Streptaxis birmanica (Blanf.), *andamanica* (Bens.), *sankeyi* (Bens.), *watsoni* (Blanf.), *theobaldi* (Bens.), and *blanfordi* (Theob.). Hanley & Theobald, Conch. Ind. pl. 8. figs. 5–10.

Ennea papillifera, sp. n., Jickeli, Mal. Blätt. xx. p. 108, province Hamaszen, Abyssinia.

Ennea calameli and *chaperi*, spp. nn., Jousseaume, R. Z. (2) xxiii. pp. 12 & 14, pl. 2. figs. 3 & 4, Novo Redondo, Benguela.

Ennea blanfordiana, sp. n., Godwin-Austen, P. Z. S. 1872, p. 515, pl. 30. fig. 4, North Cachar hills, 5700 feet, N.E. Bengal.

[*Gibbulina*] *Pupa* (*Gonidomus*) *sulcata* (Müll.), jaw not found, radula with oblique rows, marginal teeth aculeate, as in *P. palanga*. Bland & Binney, Ann. Lyc. N. York, x. p. 222.

Gibbulina adamsiana, sp. n., G. & H. Nevill, J. A. S. B. xxxix. pt. 2, p. 7, pl. 1. fig. 17, Mauritius.

Pupa (*Gibbulina*) *macrogyra*, sp. n., subfossil from Gomera, Canaries. Mousson, Malacol. Can. p. 122; allied to *dealbata* (W. & B.).

Spiraxis haughtoni (Bens.). Hanley & Theobald, Conch. Ind. pl. 19. fig. 1, Andaman Islands.

Oxygnatha (Zonitidæ).

[*Philomycus*] *Tebennophorus sallæi* (Crosse & Fischer, 1869); its anatomy and external characters described by Fischer & Crosse, Moll. terr. et fluv. de Mexique, pp. 183–191, pl. 9. figs. 6–13; jaw slightly striate, with a median projection.

Limax maximus (L.)=*cinereus* (Lister, auctt.) and *L. cinereoniger* (Wolf); an account on their varieties in colours observed in Norway, by Jensen (N. Mag. Naturv. ?), 1872, pp. 148, 149, 162, 168, 183 (separate print, pp. 46, 47, 60, 66, 81), those of *agrestis* (L.), *ibid.* p. 162 (p. 60).

Limax marginatus (Müll.), var. n. *albonaculatus*, *id. l. c.* p. 150 (p. 48), Laurvik; *L. tenellus*, var. n. *grisea*, *id. l. c.* p. 158 (p. 56), Laugesund, Norway.

Limax saxorum, sp. n. (?=*agrestis*, L., var.), *crispatus*, sp. n., *fulvus* (Normand), and *arborum* (Bouchard), with var. n. *nemorosa*, described and figured by A. Baudon, Mém. Soc. Oise, vii. pp. 14–22, pl. 2. fig. 1, pl. 3. figs. 1–5, pl. 4. figs. 1–4, 5–9, & 10–12, N. France.

Limax brunneus (Drap.) described by D. F. Heynemann, Mal. Blätt. xix. pp. 148 & 149, 2 woodcuts [=*lævis*, Müll.]. Also described and figured from French specimens, under the name *Krynickillus brunneus*, Baudon, *l. c.* p. 12, pl. 2. figs. 6–10.

Limax guatemalensis (Crosse & F., 1870) described and figured from specimens in spirits, by Fischer & Crosse, Moll. terr. et fluv. de Mexique, p. 181, pl. 9. figs. 1–5; allied to *Megapelta semitecta* (Mörch) and *Krynickia americana* (Tate).

Limax cobanensis, sp. n., Crosse & Fischer, J. de Conch. xx. p. 59, Coban, Vera Paz, Central America.

The known species of *Parmacella* enumerated, the genera *Drusia* and *Girasia* of Gray criticised, and the radula of *P. deshayesi* (Moq. Tand.) described, by P. Fischer, J. de Conch. xx. pp. 206–209.

Parmacella auriculata and *callosa*, spp. nn., Mousson, Malacol. Canar. pp. 9 & 10; the first, pl. 1. figs. 1 & 2 (=Pfeiffer, Novitat. Conch. iv. p. 51, pl. 119), Fuerteventura, Canaries.

Vitrina exilis (Morelet) from Alaska, described by E. v. Martens, Mal. Blätt. xix. p. 78.

Vitrina mamillata (Martens), Pfeiffer, Novitat. Conch. iv. p. 44, pl. 118. figs. 1–3, Abyssinia.

Vitrina helicoidea, *semirugata*, *devexa*, *martensi*, and *planulata*, spp. nn., Jickeli, Mal. Blätt. xx. pp. 99–101, province Hamaszen, Abyssinia.

Vitrina canariensis, *latebasis*, and *reticulata*, spp. nn., Mousson, *l. c.* pp. 13 & 14, pl. 1. figs. 10–12, 4–6, and 13–15; *V. blaueri* (Shuttl.), *id. ibid.* p. 14, pl. 1. figs. 7–9 (=Pfeiffer, Novitat. Conch. iv. pp. 52–54, pl. 119), Canaries.

Helicolimax nitida (Gould), *marcida* (Gould), and *ruivensis* (Couth.): some notes on the colours of the living animals, by Mörch, Vid. Medd. xi. pp. 12 & 13.

Helicarion (*Hoplites*?) *croceus*, *theobaldi*, and *solidus*, spp. nn., Godwin-Austen, P. Z. S. 1872, pp. 517 & 518; the first and last figured pl. 30. figs. 9 & 10, Cherraponjee, Khasi and Cachar hills, N.E. Bengal.

Nanina vitellus (Shuttl.), jaw and radula described by G. Schako, Mal. Blätt. xx. pp. 162 & 163, pl. 5. figs. 1–8.—*N. fulvizona* (Mouss.) and *wallacii* (Pfr.), particulars concerning their shells and soft parts, *N. limbifera* and *N. semisculpta*, spp. nn., from Celebes. Martens, Mal. Blätt. xx. pp. 164–167.

Nanina jacquemonti (Martens), Pfeiffer, Novitat. Conch. iv. p. 48, pl. 118. figs. 6–8, Himalaya.

Nanina hoyti, *tenella*, *otareæ*, and *godeffroyana*, spp. nn., Garrett, Am. J. Conch. vii. pp. 221–223, pl. 19. figs. 6–9, Viti Islands.

Nanina (*Cryptozona*) *turbinata*, sp. n. (Beck, name only), Mörch, J. de Conch. xx. p. 335, Tranquebar, at the foot of the Nilgherries. [The name *Cryptozona* is apparently intended to represent a section of *Nanina*, comprising *ligulata* (Fér.) and *naninoides* (Bens.).]

[*Nanina* and *Macrochlamys*.] *Helix basilessa* (Bens.), *pollux* and *castor*

(Theob.), *orthoplax* (Bens.), *cherraensis* (Blanf.), *gordoniæ* (Bens.), *plicatula* (Blanf.), *haughtoni*, *trochalia*, and *cyclotrema* (Bens.), *taprobanensis* (Dohrn), *cyix*, *hyba*, *palmaria*, *aulopis*, and *bombax* (Bens.), *hodgsoni* (Blanf.), *regulata* and *chloroplax* (Bens.), and *planiuscula* (Hutt.). Hanley & Theobald, Conch. Ind. pl. 25. fig. 2, pl. 26. figs. 2–6, pl. 27. figs. 1 & 2, pl. 28. figs. 1, 3, 4, 7, 10, pl. 29. figs. 2–4, pl. 30. figs. 2–8, pl. 31. figs. 1–6, pl. 32. figs. 1 & 4.—*H. laidleyana* (Bens.), *uter* (Theob.), *rosamonda* (Bens.), *blanfordi* (Theob.), and *ornatissima* (Bens.), *iid. ibid.* pl. 58. figs. 3, 5, 7, 8, and pl. 59. figs. 5 & 6, pl. 60. figs. 1–4, Brit. India.

Macrochlamys (*Durgella*) *cumahensis*, sp. n., Theobald & Stoliczka, J. A. S. B. xli. pt. 2, p. 334, pl. 11. figs. 9 & 10, Kumah Hill, Arakan.

(*Nanina*?) *Helix travancorica*, *chœnix*, *acerra*, and *pedina* (Bens.), *rubellocincta* (Blanf.), and *albizonata* (Dohrn). Hanley & Theobald, *l. c.* pl. 50. fig. 6, pl. 51. figs. 1–3, 5 & 6, and pl. 52. fig. 6.—*H. cingalensis* (Bens.)=*emiliana* (Reeve, *nec* Pfr.), *acris*, *galea*, and *camura* (Bens.), *iid. ibid.* pl. 54. figs. 1, 2, 6, 7, pl. 55. fig. 2.—*H. subdecussata* (Pfr.) and *koondaensis* (Blanf.), *iid. ibid.* pl. 56. figs. 4, 5, & 6.—*H. ingrami* (Blanf.), *iid. ibid.* pl. 60. figs. 9 & 10. All from British India.

[*Trochonanina*] *Nanina plicatula* (Martens), Pfeiffer, Novitat. Conchol. iv. pl. 118. figs. 17 & 18, Zanzibar.

Nanina (*Rotularia*) *reinhardi*, sp. n., Mörch, J. de Conch. xx. p. 309, and Vid. Medd. xi. p. 17, Nicobar Islands.

N. serrula (Bens.), Theobald & Hanley, *l. c.* pl. 50. fig. 7.

[*Trochomorpha*] *Helix tavinniensis*, sp. n., Garrett, Am. J. Conch. vii. p. 223, pl. 19. fig. 10, Tavinni, Viti Islands.

[*T.*] *H. austeni* (Blanf.), *falcata* and *pansa* (Bens.). Theobald & Hanley, *l. c.* pl. 50. figs. 8 & 9, pl. 54. fig. 10, and pl. 56. fig. 1.

[*T.*] *H.* (*Videna*) *bellengerensis* (Cox, 1871)=*bellengenensis* (Brazier, 1871) Brazier, P. Z. S. 1871, p. 805.

Nanina (*Videna*) *sulcipes* and *billeana*, spp. nn., Mörch, J. de Conch. xx. p. 335, and Vid. Medd. xi., Nicobar Islands; the first with a longitudinal furrow on the underside of the foot.

Helix (*Kaliella*) *peliosanthi*, sp. n., *id.* Vid. Medd. xi. p. 13, Gardens in Calcutta.

[*Thalassia*] *Helix* (*Rhyssota*) *subrugata* (Pfr., 1851) = *graftonensis* and *clarenciensis* (Cox, 1864), New Holland, not New Zealand. Brazier, P. Z. S. 1872, p. 807.

Nanina (*Thalassia*) *kjellerupi*, sp. n., Mörch, J. de Conch. xx. p. 3, and Vid. Medd. xi. Nicobar Islands.

[*Microcystis*] *Helix molecula* and *neherensis* (Bens.), Hanley & Theobald, *l. c.* pl. 32. figs. 8 & 9 and 5 & 6, British India.

Nanina (*Microcystina*) *rinki* and (*Liocystis*) *bruni*, spp. nn., Mörch, J. de Conch. xx. p. 312, and Vid. Medd. xi. p. 13, Nicobar Islands.

Helix (*Microcystis*) *catletti*, sp. n., Brazier, P. Z. S. 1872, p. 617, Lord Howe's Island, off the coast of New S. Wales.

Zonites. Fischer & Crosse, Moll. terr. et fluv. du Mexique, pp. 153–178, admit this genus in its widest extension, following Moquin-Tandon, and including *Hyalina* (Gray): they arrange the species from Mexico and Guatemala in the following order:—

Sect. 1. *Moreletia* (Gray). Shell striate above, with rather large umbi-

licus; caudal pore well developed: *Z. euryomphalus* (Pfr.), p. 155, pl. 7. fig. 1, Guatemala; *metonomasticus*, new name for *Helix zonites* (Pfr.), p. 157, pl. 7. fig. 2, Chiapa and Vera Cruz; *paradensis* (Pfr.); *veracruzensis* (Pfr.), p. 159, pl. 7. fig. 8, Cordova, Vera Cruz; *lucubratus* (Say), p. 161, distinct from *friabilis* (Binn.), with a var. from Oajaca; *caducus* (Pfr.), p. 163, pl. 7. fig. 3, Orizaba and Texas; *fuliginosus* (Griffith), p. 164; *tuxtlensis* (Crosse & F., 1870), p. 166, pl. 7. fig. 6, Vera Cruz; *bilineatus* (Pfr.), Cordova, with 2 or 3 or even no bands; *vitrinoides* (Tristram), p. 170, Guatemala.

Sect. 2. *Habroconus* (Crosse & F., 1869). Shell conical, imperforate, nearly smooth; caudal pore well developed; may perhaps be united with *Guppia* (Mörch): *Z. selenkai* (Pfr.), p. 171, pl. 7. fig. 9; *trochulinus* (Morelet), p. 172, Guatemala.

Sect. 3. *Hyalinia* (Agassiz, 1837)=*Hyalina* (Gray, 1842) [les Hyalines, Fér., 1821]: *Z. subhyalinus* (Pfr.), Vera Cruz; *nitidopsis* and *pauciliratus* (Morelet), Guatemala; *tehuantepecensis* (Crosse & F., 1870), p. 176, pl. 10. fig. 1, Tehuantepec; *minusculus* (Binn.), p. 175,=*minutalis* (Morelet), Yucatan,=*apex* (Reeve), widely spread in the continent of North America and also in some West-Indian islands; *elegantulus* (Pfr.), Vera Cruz; *fulvoideus* (Morelet) Carmen Island. Crosse & Fischer, Moll. terr. et fluv. Mex. pp. 153–178: pl. 8. figs. 1–9, digestive and genital organs, jaw and radula of *Z. euryomphalus*; figs. 10–12, jaw and radula of *Z. bilineatus*; figs. 13–16, radula of *Z. caducus*.

Zonites crypta (Parr.), allied to *compressus* and *acies* (Mhlfld.): Martens, Nachr. malak. Ges. 1872, p. 8.

Helix (*Zonites*) *subnitens*, sp. n., Gassies, J. de Conch. xx. p. 366, New Caledonia.

Zonites desmazuresi, sp. n., Crosse, J. de Conch. xx. p. 225, New Caledonia.

Helix (*Zonites*) *gaveleri*, sp. n., Brazier, P. Z. S. 1872, p. 618, S. Australia.

[*Mesomphix*] *Zonites lævigatus* (Pfr.) and *demissus* (Binn.); jaw described by Binney & Bland, P. Ac. Philad. 1872, p. 135.

Hyalina canariæ, sp. n., and *H. lenis* (Shuttl.), Mousson, Malac. Can. pp. 16 & 17, pl. 1. figs. 16–18 & 19–21 (=Pfeiffer, Novitat. Conch. iv. p. 55, pl. 119), Canaries.

Hyalina? abyssinica and *H. vestii*, spp. nn., Jickeli, Mal. Blätt. xx. pp. 101 & 102, province Hamaszen, Abyssinia.

[*Hyalina*] *Helix surinamensis*, sp. n., Pfeiffer, Mal. Blätt. xix. p. 75, pl. 2. figs. 14–16, Paramaribo, Surinam.

Helix (*Crystallus*) *festinans* (Shuttl.) and *vermiculum* (Lowe); Mousson, Malac. Can. pp. 17 & 18, pl. 1. figs. 22–24 & 25–27 (=Pfeiffer, Novitat. Conch. iv. p. 56, pl. 119), Canaries.

Nautilinus, subg. n. for *Hyalina clymene* (Shuttl.), on account of its involute nautiloid shell: Mousson, *l. c.* p. 19, pl. 1. figs. 28–33 (=Pfeiffer, Novitat. Conch. iv. p. 57, pl. 119), Teneriffe.

[*Gastrodonta*] *Zonites lasmodon* (Phillips) and *internus* (Say); jaw described by Bland & Binney, P. Ac. Philad. 1872, p. 135.

Helix (*Conulus*) *umbraculorum* (Cox, 1864)=*wilcoxi* (Cox, 1864): Brazier, P. Z. S. 1871, p. 806.—*H.* (*C.*) *liardeti*, sp. n., *id. l. c.* 1872, p. 618, New South Wales.

[*Conulema* (Stoliczka)] *Helix gratulator* and *confinis* (Blanf.), Hanley &

Theobald, Conch. Ind. pl. 16. figs. 2 & 6; *arx* (Bens.), *iid. ibid.* pl. 54. fig. 8; *apicata* (Blanf.), *iid. ibid.* pl. 54. f. 5.

[*Sesara*] *Helix pylaica* (Bens.), *iid. ibid.* pl. 15. fig. 2; *H. mammillaris, helicifera* (Blanf.), and *basseinensis* (Bens.), *iid. ibid.* pl. 50. figs. 1–4, & pl. 30. fig. 7; *H. capessens* and *diplodon* (Bens.), *iid. ibid.* pl. 60. figs. 5 & 6.

Sagda: the quadrate, non-aculeate form of the marginal teeth is ascertained also in *S. jayana* (C. B. Ad.) by Bland and Binney, Ann. Lyc. N. York, x. p. 219.

Helix circumfirmata (Redfield) and *bermudensis* (Pfr.); the radula of both and the jaw of the latter prove that they must be placed among the *Vitrinacea*. *Iid. ibid.* p. 221.

Helix (*Sagdinella*) *didrichseni*, sp. n., Mörch, Vid. Medd. xi. p. 20, and J. de Conch. xx. p. 312, Nicobar Islands (coloration and sculpture as in *Streptaxis*; peristome simple).

Leucochroa may be replaced as a subgenus of *Helix*: jaw and radula of *L. boissieri* (Charp.) described; jaw smooth, with median projection, but marginal teeth subquadrate. Bland & Binney, *l. c.* p. 220.

L. ultima, pressa, and *accola*, spp. nn., Mousson, Malacol. Can. pp. 19–21, pl. 1. figs. 34–36, 37–39, 40 & 41 (=Pfeiffer, Novitat. Conch. iv. pp. 57–59, pl. 119), Fuerteventura.

Odontognatha and Aulacognatha.

Pallifera dorsalis (Binn.) climbs on trees; jaw distinct from that of *Tebennophorus* [*Philomycus*]. Bland & Binney, P. Philad. Ac. 1872, p. 137.

Arion. For critical remarks concerning the German species, *cf.* H. v. Maltzan, Arch. Ver. Mecklenb. xxvi. pp. 66 & 67.

Arion ater (L.), var. *albus* [Müll.], from Norway, described by Jensen (N. Mag. Naturv.?) 1872, p. 157 (sep. print, p. 55), Laugesund, Norway; var. n. *cinereonebulosus, id. ibid.* p. 175 (p. 73); var. *medius, id. ibid.* p. 176 (p. 74), pl. 1. fig. 11, both from Arendal, Southern Norway.

A. fuscus, var. *quadrifasciatus, id. ibid.* p. 184 (p. 82), Aamodt, Norway; var. *medius*, allied to *melanocephalus* (F. B.), *id. ibid.* p. 187 (p. 85), Lillesand, Norway.

A. melanocephalus (Fauve Biguet) = young of *empiricorum* (Fér.); *A. brunneus* (Lehmann) is probably in the same case. Seibert, Nachr. mal. Ges. 1872, pp. 83–87.

A. leucophæus (Normand); specific distinctness defended by Van den Broeck, Bull. Mal. Belg. vii. p. xlvi.

A. rubiginosus, sp. n., *tenellus* (Millet), and *bourguignati*, sp. n., described and figured by A. Baudon, Mém. Soc. Oise, vii. pp. 4–9, pl. 1. figs. 1–3, 4–7, and pl. 3. figs. 6–11, Northern France. [The second appears very near to, if not identical with, *melanocephalus* (Fauve Biguet), the third with *fuscus* (Müll.).]

Geomalacus mabillii, sp. n., and *G. hiemalis* (Drouet), described and figured by A. Baudon, *l. c.* pp. 11 & 12, pl. 1. figs. 8–12, and pl. 2. figs. 2–5 [=young individuals of *Arion, teste* Heynemann, Mal. Blätt. 1873].

Hemphillia, g. n., Bland & Binney, Ann. Lyc. N. York, x. p. 208–211, pl. 9. figs. 1, 3, 5, 15–17. Shell unguiform, like that of [*H*]*omalonyx*, external; jaw ribbed, as in *Arion*; lingual membrane as usual in the *Helicidæ*, containing

23 . 1 . 23 teeth in one row, centrals tricuspid, laterals bicuspid, marginals about 12, quadrate; at the hinder end of the foot a greatly produced and horn-shaped process, overhanging a transverse mucous slit. *H. glandulosa*, sp. n., *iid. ibid.*, Astoria, Oregon.

Xanthonyx (Crosse & F., 1867); distinctive characters pointed out and anatomy given by Fischer & Crosse, Moll. terr. et fluv. Mex. pp. 192–199, pl. 9. figs. 14–17. Shell vitriniform; jaw ribbed, as in *Arion*; a long flagellum, and a two-branched bursa copulatrix; foot narrow, elongate, without caudal pore; lateral and marginal teeth of the radula bicuspid. *X. salleanus* (Pfr.), p. 199, pl. 10. fig. 2; *cordovanus* (Pfr.), p. 200, pl. 10. fig. 3; *sumichrasti* (Brot), p. 201, and *chiapensis* (Pfr., as *Simpulopsis*), p. 203; all from Mexico.

[*Patula*?] *Zonites uziellii*, sp. n., Issel, Atti Soc. Ital. xv. 1 (p. 5), Pisa.

Patula textilis (Shuttl.), *concinna* and *putrescens* (Lowe), *engonata* and *retexta* (Shuttl.): Mousson, Malacol. Can. pl. 1. figs. 42–44, 45–47, 48–50, pl. 2. figs. 1–4 & 5–8 (=Pfeiffer, Novitat. Conch. iv. pp. 59–61, pls. 119 & 120), Canaries.

Patula (*Pyramidula*) *placida* (Shuttl.): Mousson, *ibid.* p. 25, pl. 2. figs. 9–12 (=Pfeiffer, *l. c.* p. 62, pl. 120), Teneriffe and Hierro.

Patula (*Acanthinula*) *spinifera*, sp. n., *id. ibid.* p. 25 (=Pfr. *l. c.* p. 63, pl. 120. figs. 17–20), Palma, Canaries; *P.* (*A.*) *servilis* (Shuttl.), *id. ibid.* pl. 2. figs. 13–16 (=Pfr. *l. c.* p. 63, pl. 120), Teneriffe.

Patula (*Janulus*) *pompylia* (Shuttl.), *id. ibid.* p. 27, pl. 2. figs. 29–32 (=Pfr. *l. c.* p. 65, pl. 120), Palma.

Lyra, subg. n. for the species of *Patula* with spiral lines, *P.* (*L.*) *circumsessa* (Shuttl.) and *torrefacta* (Lowe); *id. ibid.* pp. 26, 27, pl. 2. figs. 21–24 & 25–28 (=Pfr. *l. c.* p. 64, pl. 120), Canaries.

Patula strigosa (Gould), *cooperi* (Binn.), *idahoensis* (Newc.), and *perspectiva* (Say); jaw described by Bland & Binney, P. Ac. Philad. 1872, pp. 135 & 136.

For the Mexican species of *Patula*, see *Helix*.

Patula cronkheiti (Newcomb) from Alaska: Martens, Mal. Blätt. xix. p. 79.

Helix (*Charopa*) *midsoni*, new name for *atkinsoni* (Cox, 1871, *nec* Theobald, 1850): Brazier, P. Z. S. 1872, p. 806.

H. (*C.*) *milliyani* (Brazier, 1871) = *scrupulus* (Cox, 1871): *id. ibid.* p. 807.

Guesteria, g. n. Shell imperforate, corneous, thin, depressed, quite involute, the last whorl only visible; aperture like that of *Nautilus*, peristome thin, simple. Animal unknown. Type *Helix powisiana* (Pfr.), mountains of New Granada. Crosse, J. de Conch. xx. pp. 197–201, pl. 13. fig. 1.

Pityx (Beck) = *Endodonta* (Albers) [see Zool. Rec. viii. p. 152], *jacquinoti* (Pfr.), *bursatella* (Gould), *retunsa* (Pearse), *fratercula* (Pease), and *P. tumuloides*, sp. n., carry their young in the cavity of the umbilicus, and may be termed *marsupial* snails. Garrett, Am. J. Conch. vii. p. 226.

Pityx tumuloides, *cavernula*, *canalis*, *rudis*, *decorticata*, *harveyensis*, *otareæ*, *youngi*, *tenuicostata*, *proxima*, and *multilamellata*, spp. nn., *id. ibid.* pp. 225–230, pl. 19. fig. 15–25, Cook's Isles, Rarotonga.

Helix. European species :—

Helix costata and *pulchella* (Müll) ; intermediate forms occur in Mecklenburg. Maltzan, Arch. Ver. Mecklenb. xxvi. p. 72.

[*Fruticicola*] *Helix anconæ*, sp. n., Issel, Atti Soc. Ital. xv. 1 (p. 8), Tuscany and Liguria; nearly allied to *H. olivieri* (Fér.). [This name is not from the town of Ancona, but from that of Prof. C. D'Ancona, and has been employed by Gentiluomo for a supposed var. of *cingulata* (Stud.) in Bull. Mal. i. p. 49.]

[*Xerophila*] *Helix ericetorum*, var. n. *græca*, Martens, Mal. Blätt. xx. pp. 36 & 37, pl. 2. fig. 1, Nauplia and Tripolitza in the Morea.

Campylæa. Brusina treats of the Dalmatian and Croatian species of this subgenus, viz. *cærulans* (Mhlfld.), *stenomphala* (Menke), *pouzolzi* (Michel.), *denudata* (Rossm.), *insolida* (Ziegl.), *umbilicaris* (Brumati), *sadleriana* (Zgl.), *hirta* (Menke), *setigera* and *setosa* (Ziegl.), and *crinita* (Sandri), and numerous varieties of some of them. Ann. Mal. Belg. iv. 49 pp. [Omitted from Zool. Rec. vi.]

Helix cingulata (Stud.) occurs on the Greppa pass, in the Venetian Alps. Martens, Nachr. mal. Ges. 1872, p. 44.

Helix argentellii, sp. n., Kobelt, *ibid.* p. 49, and Martens, Mal. Blätt. xx. p. 34, pl. 3. fig. 7, Taygetus, Peloponnesus.

Helix kleciachi and *prætextata* (Parr.) : on their affinity to *insolita* (Rossm.), *cf.* Martens, Nachr. malak. Ges. 1872, p. 8.

Helix crinita (Sandri) has been again found near Verlicca, in Dalmatia, by B. Kleciach, *ibid.* pp. 61 & 62.

Helix confusa (Benoit) and *benedicta*, sp. n., both from Sicily, *serbica* and *paucici* (Möllend.), from Servia, described and figured by W. Kobelt, Mal. Blätt. xix. pp. 125–133, pl. 4. figs. 1–3, 4–6, 7–9, 10–12.

Helix mœllendorfi (Kobelt); Pfeiffer, Novitat. Conch. iv. p. 47, pl. 118. figs. 15 & 16, Bosnia.

[*Tachea*] *Helix nemoralis, hortensis, silvatica, austriaca*, and *atrolabiata*; the known varieties in the bands enumerated by E. v. Martens, Nachr. mal. Ges. 1872, pp. 17–20.

Helix. African species :—

Acanthinula membranacea, sp. n., Jickeli, Mal. Blätt. xx. p. 102, province Hamaszen, Abyssinia.

Helix desertella, sp. n., Jickeli, Nachr. mal. Ges. 1872, p. 62, Habab, shore of the Red Sea.

Helix (*Euparypha*) *geminata*, sp. n. (=*pisana*, var., in Küster's new edition of Chemnitz; *Helix*, pl. 37. figs. 1–4), with two varieties, *clausoinflata* and *parvula*: Mousson, Malacol. Can. pp. 29–31. *H. grasseti* (Tarnier, *in litt.*)= *pisana* var. (new ed. of Chemn. pl. 37. figs. 5–8) =*planata* (Webb & Berthelot, Moll. Can.) and *H. impugnata* (Mouss. 1857), also distinguished from *H. pisana*: *id. ibid.* pp. 31, 33, pl. 2. figs. 33, 34 & 35, 36 (Pfeiffer, Novitat. Conch. iv. pp. 65 & 66, pl. 120).

Helix (*Xerophila*) *herbicola* (Shuttl. *in litt.*) and *adoptata*, spp. nn., Mousson, *l. c.* pp. 35 & 37, pl. 2. figs. 37, 38, & 39–41 (Pfeiffer, *l. c.* pp. 67 & 68, pl. 120), Canaries. *H. orbignii* (W. & B.), varr. nn. *mitigata* and *calcarea*, *id. ibid.* p. 37, Teneriffe, Lanzarote, and Fuerteventura.

Monilearia, subg. n., proposed for *Helix monilifera* and *phalerata* (W. & B.)

and allied species from the Canaries [corresponding to *Xerophila*, e. *Tectiformes*, Albers, 2nd ed.] ; also *H. præposita*, sp. n., *cæmentitia* and *oleacea* (Shuttl.), *woodwardia* (Tarnier, *in litt.*), sp. n., *id. ibid.* pp. 39–45, the three last figured, pl. 2. figs. 42–44, 45–47, and 48–50 (Pfeiffer, *l. c.* pp. 68–70, pl. 120), Canaries.

Helix (*Turricula*) *inops*, *moderata*, and *nodosostriata*, spp. nn., and *mirandæ* (Lowe), *id. ibid.* pp. 48–51, pl. 3. figs. 1–3, 4–6, 7–9, and 19–21 (Pfeiffer, *l. c.* pp. 75–77, pl. 122), Canaries.

Helix (*Discula*) *morata* and *multipunctata*, spp. nn., *id. ibid.* p. 54, the latter pl. 3. figs. 16–18 (Pfeiffer, *l. c.* p. 80, pl. 122), Fuerteventura. *H.* (*D.*) *pulverulenta* (Lowe) and *granostriata* (Mouss. 1857), *ibid.* pp. 52 & 53, pl. 3. figs. 10–12 & 13–15 (Pfeiffer, *l. c.* pp. 78 & 79, pl. 122), Canaries.

Helix (*Hispidella*) *pavida*, sp. n., *id. ibid.* p. 56, Palma, Canaries. *H.* (*H.*) *nubigena* (Lowe), *id. ibid.* pl. 3. figs. 22–24 (Pfeiffer, *l. c.* p. 80, pl. 22), Teneriffe.

H. (*Ochthephila*) *multigranosa*, sp. n., and *eutropis* (Shuttl.), *id. ibid.* pp. 59 & 58, pl. 3. figs. 25–27 & 28–30 (Pfeiffer, *l. c.* pp. 81 & 82, pl. 122), Canaries.

Ciliella, subg. n., proposed for *Helix ciliata* (Venetz) and two Canarian species, *Helix* (*C.*) *lanosa*, sp. n., and *leprosa* (Shuttl.) : *id. ibid.* pp. 60–62, the two last, pl. 3. figs. 34–36 & 31–33 (Pfeiffer, *l. c.* pp. 82 & 83, pl. 122).

Helix (*Gonostoma*) *hispidula* (Lam.), var. n. *subhispidula*, *H. afflicta* (Fér.), var. *planaria* (Lam.), from Teneriffe, and *H. lenticula* (Fér.), var. n. *virilis*, from Fuerteventura : *id. ibid.* pp. 63–65. *H. discobolus* (Shuttl.), *id. ibid.* p. 66, pl. 4. figs. 1 & 2 (Pfeiffer, *l. c.* p. 84, pl. 123), Gomera, Canaries.

Helix (*Leptaxis*) *digna*, sp. n., Gomera, subfossil, and *H. cuticula* (Shuttl.), Teneriffe, *id. ibid.* pp. 68 & 69, pl. 4. figs. 3 & 4–6 (Pfeiffer, *l. c.* pp. 84 & 85, pl. 123).

Helix (*Macularia*) *adonis* and *efferata*, spp. nn., Gomera, subfossil, *id. ibid.* pp. 71 & 72, pl. 5. figs. 1 & 2 (Pfeiffer, *l. c.* pl. 125).

Helix (*Iberus*? [*? potius Hemicycla*]) *harmonica*, sp. n., *id. ibid.* p. 74, pl. 4. fig. 11, Hierro; *H. merita* and *semitecta*, spp. nn., subfossil, Gomera, *id. ibid.* pp. 74 & 75, the latter, pl. 4. figs. 16 & 17. *H. gomerensis* (Morelet), *plutonia* and *berkleyi* (Lowe), *id. ibid.* pl. 4. figs. 9 & 10, 12 & 13, and 7 & 8. *H. planorbella* (Lam.) and var. n. *incisogranulata*, Gomera, *id. ibid.* pp. 176 & 76, pl. 4. figs. 18 & 19 (as to all, *cf.* Pfeiffer, *l. c.* pp. 85–88, pl. 123).

Helix (*Hemicycla*) *inutilis*, *temperata*, *retrodens*, *fritschi*, *invernicata*, *indifferens*, and *distensa*, spp. nn., *id. ibid.* pp. 80–101, pl. 5. figs. 1, 2, 5 & 6, 12, 13, 20, 21, and pl. 4. figs. 14, 15. *H. desculpta* and *gravida*, spp. nn., subfossil, *id. ibid.* pp. 83 & 85. *H. bethencourtiana* (Shuttl.), *pæteliana* (Shuttl.), *pseuthyra* (Lowe), *saponacea* (Lowe), *consobrina* (Fér.), and *gaudrii* (Orb.), *ibid.* pl. 5. figs. 3 & 4, 7, 8, 9–11, 14 & 15, and 16–19 : all Canarian (*cf.* also Pfeiffer, *l. c.* pl. 124).

Stylodonta (*Erepta*) *bewsheri*, sp. n., H. Adams, P. Z. S. 1872, p. 12, pl. 3. fig. 18, Bourbon.

Helix newtoni, sp. n., G. & H. Nevill, J. A. S. B. xxxix. 1871, part 2, p. 6, Mauritius.

Helix (*Discus*) *levieuxi*, sp. n., *iid. ibid.*, Seychelles.
Helix (*Conulus*) *subturritula*, sp. n., *iid. l. c.* p. 7, Seychelles.

Helix. Asiatic species :—

Helix bifoveata (Bens.), *phayrii* and *akoutengensis* (Theob.), *rotatoria* (v. d. Busch ?), *oldhami* (Bens.), *atkinsoni* (Theob.), *tapeina* var. *arakanensis*, *bascauda*, and *cassidula* (Bens.), *polypleuris* (Blanf.), *calpis* (Bens.), *pongee* (Theob.), and *tertiana* (Blanf.) : Hanley & Theobald, Conch. Ind. pl. 14. fig. 8, pl. 15. figs. 1–10, and pl. 16. figs. 1–10. [Some of them may belong to *Trochomorpha*.] *H. hemiopta* (Bens.), *iid. ibid.* pl. 30. fig. 4, and pl. 53. fig. 8. *H. helferi* and *propinqua* (Bens.), *iid. ibid.* pl. 29. figs. 8 & 9, pl. 30. fig. 10. *H. scenoma*, *pilidion*, *bolus*, and *scalpturita* (Bens.), *iid. ibid.* pl. 53. figs. 3–9; *contracta* (Bens.), *iid. ibid.* pl. 55. figs. 8 & 9; *catostoma* (Bens.), pl. 56. figs. 2 & 3; *peguensis* (Bens.), *iid. ibid.* pl. 58. fig. 6 : British India.

Helix (*Plectopylis*) *plectostoma* (Bens.), *perarcta* (Blanf.), *repercussa* (Gould), *pinacis* (Bens.), *karenorum* (Blanf.), *anguina* (Gould), *liophis* and *cyclaspis* (Bens.), *iid. ibid.* pl. 13. figs. 2–8 & 10, Transgangetic India. *H. anax*, *odontophora*, and *brachyplecta* (Bens.), *iid. ibid.* pl. 57. figs. 1–6 & 7–10, British India.

Helix collis, and? also *embrechtiana* (Mouss.), = *zonaria* (L.), var. : Martens, Mal. Blätt. xx. pp. 153 & 154.

Helix quoyi (Desh.). Jaw and radula described by G. Schako, *ibid.* p. 169, pl. 5. figs. 1–6.

H. marginata (Müll.). Some varieties of the same from the Sooloo archipelago and Northern Celebes discussed by Martens, *ibid.* pp. 171 & 172.

Helix kobeltiana (Pfr.), Pfeiffer, Novitat. Conch. iv. p. 73, pl. 121. figs. 12 & 13, Ceram. [Scarcely distinct from *H. marginata* (Müll.) : see Martens, Mal. Blätt. xx. p. 172.]

Helix nimbosa (Crosse) = *peliomphala* (Pfr.), var. : Martens, *l. c.* p. 152.

Helix fasciola (Drap., 1805) = *pyrrhozona* (Philippi, 1845), Mabille, R. Z. (2) xxiii. p. 50; = *striatula* (O. Fr. Müll., 1774) : Martens, Nachr. mal. Ges. 1872, p. 74.

Helix. Australian and Polynesian species :—

Helix coguiensis, sp. n., Crosse, J. de Conch. xx. pp. 69 and 148, pl. 7. f. 3, Mount Cogui, New Caledonia.

H. rossiteriana (Crosse, 1871, *nec rossiteri*, Angas) is renamed *heckeliana*, *id. ibid.* p. 71.

Helix perroquiniana (Crosse), var. *B*, *id. ibid.* p. 226, New Caledonia.

Helix bruniana, *bouraïlensis*, and *melaleucarum*, spp. nn., Gassies, *ibid.* pp. 365–367, New Caledonia.

Helix (*Trachia*) *dryanderensis*, sp. n., Cox, P. Z. S. 1872, p. 19, Queensland.

H. (*Camæna*) *mulgravensis*, sp. n., Brazier, *ibid.* p. 21, North Australia.

H. (*Hadra*) *parsoni*, sp. n., Cox, *ibid.* p. 18, pl. 4. fig. 2, Queensland.

[*Xanthomelon*] *Helix edwardsi* (Cox) = *nigrilabris* (Martens) and *jannellii* (Guillou) = *pachystyloides* (Cox). Pfeiffer, Novitat. Conch. pp. 45 & 46, pl. 118. figs. 4 & 5 and 9 & 10.

Helix (*Xanthomelon*) *lyndi*, sp. n., Angas, P. Z. S. 1872, p. 610, Port Essington.

H. (*Galaxias*) *liverpoolensis*, sp. n., Brazier, *ibid.* p. 618, Liverpool range, New South Wales.

H. (*Helicostyla*) *croftoni*, sp. n., Cox, *ibid.* p. 18, pl. 4. fig. 1, Queensland.

H. (*Geotrochus*) *leucophæa*, sp. n., *id. ibid.* p. 20, pl. 4. fig. 5, Guadalcanar, Solomon Islands.

H. (*G.*) *brodici*, *choiseulensis*, and *mendoza*, spp. nn., Brazier, *ibid.* pp. 20 & 21, pl. 4. figs. 6–8, Solomon Islands.

H. (*G.*) *philomela*, sp. n., Angas, *ibid.* p. 610, Solomon Islands.

Geotrochus fergusoni, sp. n., H. Adams, *ibid.* p. 614, New Britain.

Helix (*Geotrochus*) *hermione* (Angas, 1869) = *biocheana* (Crosse, 1870), *adonis* (Angas, 1869) = *metula* (Crosse, 1870), Brazier, *ibid.* p. 805, I. Bougainville, Solomon group.

H. (*Merope*) *novæhollandiæ* (Gray, 1834) = *dupuyana* (Pfr., 1852): *id. ibid.* p. 805.

Helix. American species :—

Helix polygyrella (Bland), *palliata* and *obstricta* (Say), *devia* (Gould), and *fidelis* (Gray). Jaw described by Bland & Binney, P. Philad. Ac. 1872, p. 136. *H. thyroides* climbs on fruit-trees, *iid. ibid.* p. 137.

Helix (*Dentellaria*) *perplexa* (Fér.). Jaw rather smooth, with median projection; marginal teeth quadrate. *Iid.* Ann. Lyc. N. York, x. p. 221.

The Mexican and Central-American species of *Helix* are thus arranged by Fischer & Crosse (Moll. terr. et fluv. du Mexique, pp. 204–209) :—

Sect 1. *Microphysa* (Albers) : *Helix berendti* (Pfr.), p. 226, pl. 10. fig. 6, Vera Cruz.

Sect. 2. *Patula* (Held) : *H. ampla* (Pfr.), *punctum* (Morelet), p. 228, pl. 12. fig. 1, Yucatan ; *turbinella* (Morelet), p. 229, pl. 12. fig. 2, Guatemala ; *impura* (Pfr.); *wilhelmi* (Pfr.), p. 230, pl. 10. fig. 5 ; *almonteana* ("*almonte*," Tristram), Guatemala; *mazatlanica* (Pfr.), Mazatlan and S. Francisco ; *conspurcatella* (Morelet), p. 232, pl. 12. fig. 3, Yucatan; *hermanni* (Pfr.), p. 233, pl. 10. fig. 4, Vera Cruz ; *coactiliata* (Fér.), p. 234, with varr. *H. cordovana* (Pfr.), pl. 12. fig. 4, and *suturalis* (Pfr.), Mexico, Guatemala, Honduras ; *pressula* (Morelet), p. 236, pl. 12. fig. 5, Guatemala.

Sect. 3. *Discus* (Albers) : *H. oajacensis* (Koch), p. 237.

Sect. 4. *Leptaxis* (Lowe) : *H. mexicana* (Koch), Mexico ?, p. 238.

Sect. 5. *Gonostoma* (Held) : *H. sigmoides* (Morelet), Vera Paz, Guatemala, p. 239, pl. 12. fig. 6.

Sect. 6. *Pomatia* (Beck) : *H. humboldtiana* (Val.) and var. *H. buffoniana* (Pfr.), p. 240, pl. 11. fig. 1.

Sect. 7. *Odontura* (new). Shell narrowly umbilicate, depressed-globular, granulate or hairy; peristome reflected. Jaw with numerous longitudinal ribs and close transverse striæ ; median tooth of radula small ; a long flagellum ; two dart-sacs ; three mucous vesicles ; hinder part of foot with a me-

dian serrated keel. *H. eximia* (Pfr.), p. 242, pl. 11. fig. 3, the living animal, pl. 9. figs. 18 & 19, anatomy, Vera Paz, Guatemala; *H. giesbreghti* (Nyst), p. 245, pl. 10. fig. 9, the living animal, Chiapa, Vera Paz, Guatemala, S. Salvador.

Sect. 8. *Arionta* (Leach): *H. stearnsiana* (Gabb), p. 248, pl. 11. fig. 5, Lower California (and Cinaloa?); *remondi* (Tryon, 1863)=*carpenteri* (Newcomb, 1861), Cinaloa and Californian peninsula; *mormonum* (Pfr.), Sonora and California; *rowelli* (Newcomb) and var. *H. læhri* (Gabb), Californian peninsula and Arizona, p. 252.

Sect. 9. *Leptarionta* (new). Intermediate between *Arionta* and *Fruticicola*; shell coloured as in the former, but thin and subtranslucent as in the latter; anatomy unknown. *H. bicincta* (Pfr.), p. 253, pl. 10. fig. 7, Oajaca; *H. flavescens* (Wiegmann), Vera Cruz and Chiapa.

Sect. 10. *Fruticicola* (Held): *H. berlanderiana* (Moricand), Tamaulipas, Texas, Arkansas; *griseola* (Pfr.)=*albolineata* (Gould), from Texas to Nicaragua, p. 258; *trypanomphala* (Pfr.), Sierra Maestra, Mexico; *salvini* (Tristram), Guatemala.

Sect. 11. *Trichia* (Hartm.): *H. obsita* (Pfr.).

Sect. 12. *Euparypha* (Hartm.): *H. areolata* (Sow.) and *veatchi* (Newc.), Cedros Island, west coast of Californian peninsula; *pandoræ* (Forbes)=*damascena* (Gould), Margarita Bay, Californian peninsula, pp. 262–263.

Sect. 13. *Strobila* (Morse): *H. strebeli* (Pfr.), p. 267, pl. 12. fig. 7, Vera Cruz.

Sect. 14. *Polygyra* (Say): *H. anilis* (Gabb), Guaymas; *plagioglossa* (Pfr.), p. 270, pl. 12. fig. 9, Oajaca and Puebla; *helictomphala* (Pfr.), p. 272, pl. 12. fig. 10, Chiapa; *hindsi* (Pfr.), Texas and Mexico; *ventrosula* (Pfr.), Colima, Mazatlan, Texas; *mooreana* (Binney), Leon and Texas; *behri* (Gabb), Guaymas; *yucatanea* (Morelet), p. 277, pl. 12. fig. 14, Tabasco and Yucatan; *texasiana* (Moricand)=*tamaulipasensis* (Lea), Texas, Tamaulipas, Vera Cruz; *bicruris* (Pfr.), Chiapa; *chiapensis* (Pfr.), Chiapa; *couloni* (Shuttl.), Vera Cruz; *implicata* (Beck, Martens), Vera Cruz; *oppilata* (Morelet), p. 285, pl. 12. fig. 11, Yucatan, Tehuantepec; *ariadnæ* (Pfr.)=*couchiana* (Lea), p. 287, pl. 12. fig. 8, Rio Grande, Matamoras, Vera Cruz; *acutedentata* (Binney), with var. *H. loisa* (Binney), Cinaloa and Texas; *contortuplicata* (Beck).

Sect. 15. *Geotrochus* (Hasselt): *H. trigonostoma* (Pfr.), including *salleana* (Pfr.), very variable, Guatemala and Honduras.

Sect. 16. *Corasia* (Albers): *H. guillarmodi* (Shuttl.), Vera Cruz, on leaves.

H. tenuicostata (Dunker) and *indistincta* (Fér.). Their occurrence in Mexico questioned, both belonging rather to the West-Indian Islands.

[The Recorder thinks it rather questionable whether the above arrangement is natural as regards the sections *Leptaxis*, *Gonostoma*, *Fruticicola*, and *Corasia*, which have a very restricted geographical range in Europe, Asia, or Africa.]

Helix sargi, p. 146, and *guatemalensis*, p. 222, Guatemala, *sumichrasti*, p. 147, Huallaga, Mexico: Crosse & Fischer, J. de Conch. xx., spp. nn.

Helix vendryesiana (Gloyne, 1871), Jamaica, fully described and figured by C. P. Gloyne, *ibid.* p. 31, pl. 2. fig. 7 [group *Polygyra*].

Helix (*Aglaia*) *macasi*, sp. n., Higgins, P. Z. S. 1872, p. 686, pl. 56. fig. 6, Macas, Ecuador.

[*Solaropsis*] *Helix kuehni*, sp. n., Pfeiffer, Mal. Blätt. xix. p. 74, pl. 2. figs. 8–10, Paramaribo, Surinam.

Labyrinthus manueli, sp. n., Higgins, *l. c.* p. 686, pl. 56. fig. 5, Macas, Ecuador.

[*Cochlostyla*] *Helix thomsoni*, *indusiata*, *tukanensis*, and *physalis* (Pfr.), Pfeiffer, Novitat. Conch. iv. pp. 70–73, pl. 121. figs. 1–11, Tukan-besi and Tular Islands [probably near the Sooloo archipelago].

Artificially coloured specimens of *Cochlostyla*, from the Philippines, pointed out by E. v. Martens, SB. nat. Fr. 1872, pp. 103 & 104.

[*Amphidromus*] *Bulimus heerianus* and *teysmanni* (Mouss.) = *winteri* (Pfr.), varr.: *id.* Mal. Blätt. xx. p. 154.

[*Amphidromus?*] *Bulimus theobaldianus* (Bens.), Hanley & Theobald, Conch. Ind. pl. 19. fig. 10, Tennasserim.

[*Pelecychilus*] *Bulimus hauxwelli*, sp. n., Crosse, J. de Conch. xx. p. 211, R. Ambiyacu, Peru. Intermediate between *B. goniostomus* (Fér.) and *distortus* (Brug.).

Bulimus (*Placostylus*) *cuniculinsulæ*, sp. n., Cox, P. Z. S. 1872, p. 19, pl. 4. fig. 3, Rabbit Island, near Lord Howe's Island, Pacific.

Bulimus (? *Borus*) *coxi*, sp. n., Pease, Am. J. Conch. vii. p. 197, Solomon Islands.

Bulimus pancheri (Crosse), var. β, Crosse, *l. c.* p. 226, New Caledonia.

[Group *Charis*, Albers.] The species of *Bulimus* known from the Viti Islands are enumerated, and the following added as new:—*B. ochrostoma*, Taviuni; *rambiensis*, Rambi; *crassilabrum*, *rugatus*, and *hoyti*, Vanua Levu; *guanensis*, Guan; and *koroensis*, Koro. Garrett, Am. J. Conch. vii. pp. 231–236, pl. 18. figs. 1–9.

Bulimus (*Charis*) *kreffti*, sp. n., Cox, *l. c.* p. 19, pl. 4. fig. 4, Solomon Islands.

[*Buliminus.*] The radula of *Bulimus detritus* (Müll.) has again been described by P. Fischer, who comes to the conclusion that it has "nothing very characteristic," and approaches that of *Pupa*. J. de Conch. xx. pp. 292 & 293, pl. xv. figs. 6–8. [The Recorder has, in his 2nd edit. of Albers's 'Heliceen,' placed the species of *Bulimus* of the European and Mediterranean faunas (= *Buliminus*, Ehrenb.), in the subfamily *Pupæa*, on account of the resemblance of the radula.

Buliminus græcus (Beck) = *corneus* (Desh., Exp. Morée, *nec* Sow., *nec* Mich.), redescribed by E. v. Martens, Mal. Blätt. xx. p. 38, pl. 2. fig. 2, Nauplia.

Buliminus (*Napæus*) *ocellatus*, sp. n., Mousson, Malacol. Can. p. 107, pl. 6. figs. 5–7, Hierro. *B.* (*N.*) *indifferens* and *texturatus*, spp. nn., Grand Canary and Gomera, *id. ibid.* pp. 116 & 117. *B. encaustus*, *propinquus*, *tabidus*, and *nanodes* (Shuttl.), *id. ibid.* pl. 6. figs. 3 & 4, 8, 9, and 10 & 11, all Canarian. The other Canarian species of this section are more accurately described, *id. ibid.* pp. 102–117 (*cf.* also Pfeiffer, Novitat. Conch. iv. pl. 125).

B. (*Petræus*) *maffioteanus*, *servus*, and *conseoanus*, spp. nn., *id. ibid.* pp. 117–119, pl. 6. figs. 15, 14, and 12 & 13 (Pfeiffer, *l. c.* pl. 125), Canaries.

[*Buliminus*] *Bulimus prætermissus* and *orbus* (Blanf.), *smithii* and *salsicola* (Bens.), and *fairbanki* (Pfr.): Hanley & Theobald, Conch. Ind. pl. 19. fig. 4,

pl. 20. figs. 1, 3, 8 & 9. *B. physalis* (Bens.), *chion* (Pfr.), *vicarius* (Blanf.), *stalix*, *estellus*, *domina*, and *pertica* (Bens.): *iid. ibid.* pl. 21. fig. 9, and pl. 22. figs. 1–7. *B. fusciventris* (Bens.) = *trifasciatus* (Brug.), young: *iid. ibid.* p. 11. All from British India.

Buliminus [*Rhachis*] *braunsi* (Martens), Pfeiffer, Novitat. Conch. iv. p. 49, pl. 118. figs. 11 & 12, Zanzibar.

B. (*Pachnodus*) *conulimus* (Martens): *id. ibid.* p. 50, pl. 118. figs. 13 & 14, Zanzibar.

Bulimus (*Harpalus*) [*Hapalus*] *khasianus* and *munipurensis*, spp. nn., Godwin-Austen, P. Z. S. 1872, p. 516, pl. 30. figs. 7 & 8, Khási and Munipur, N.E. Bengal.

Partula expansa, Tutuila I., and *bicolor*, Guam, Pease, Am. J. Conch. vii. p. 26 (1871); *turricula* and *concinna*, New Hebrides, *id. l. c.* p. 196 (1872): spp. nn.

[*Glessula*] *Achatina* (*Electra*) *theobaldi*, sp. n., *prælustris* and *chessoni* (Bens.), *tamulica* and *textilis* (Blanf.), *scrutillus*, *fairbanki*, and *hastula* (Bens.), *pertenuis* (Blanf.), *pyramis* and *orobia* (Bens.), *lyrata* (Blanf.), and *brevis* (Pfr.), Hanley & Theobald, Conch. Ind. p. 9, pl. 17. figs. 5–10, and pl. 18. figs. 1–10.—*A.* (*E.*) *facula*, *leptospira*, *botellus*, *vadalica*, *parabilis*, *notigena*, *sarissa*, *panætha*, *arthurii*, *tenuispira* (Bens.), and *obtusa*, *filosa* (Blanf.), *iid. ibid.* pl. 35. figs. 1, 2, 4, 5, 7–10, and pl. 36. figs. 2, 3, 6, 8 & 10. All from British India.

Cionella (*Ferussacia*) *reissi*, *valida*, *fritschi*, *lanzarotensis*, and *attenuata*, spp. nn., Mousson, Mal. Can. p. 134, pl. 6. figs. 26 & 27, 24 & 25, 30 & 31, 28 & 29, and 32 & 33 (= Pfeiffer, Novit. Conch. iv. pl. 125), Canaries.

Ferussacia unidentata, sp. n., Jickeli, Mal. Blätt. xx. p. 103, Alexandria.

Leptinaria lamellata (Potiez & Mich.). Median tooth of radula very small, narrow, middle point of lateral teeth very long and narrow, somewhat similar to the lateral teeth of *Zonites*, but marginal teeth as in *Helix*. P. Fischer, J. de Conch. xx. pp. 290 & 291.

Tornatellina inconspicua, sp. n., Brazier, P. Z. S. 1872, p. 619, Lord Howe's Island. To this genus belong also *Achatinella jacksonensis* and *wakefieldæ* (Cox), from New Holland, *id. ibid.* p. 807.

[*Stenogyra.*] The radula of *Bulimus decollatus* (L.) agrees in the small size and narrow form of the median tooth very well with that of *Stenogyra*. P. Fischer, *l. c.* pp. 290–292, pl. 15. figs. 4 & 5. [So stated by Ad. Schmidt in 1855.]

[*Stenogyra*] *Achatina oasiaca* (Bens.), type from the Naga hills, not Khási hills. Godwin-Austen, P. Z. S. 1872, p. 517.

Stenogyra vernicosa, *suavcolata* [*-olens*], *subulata*, *angustata*, and *variabilis*, spp. nn., Jickeli, Mal. Blätt. xx. pp. 103–105, Hamaszen and Habab, Abyssinia.

Rumina (*Stenogyra*) *pairensis*, sp. n., Higgins, P. Z. S. 1872, p. 685, pl. 56. fig. 1, Paira, Ecuador.

Opeas apex (Mouss.), var. n. *nicobarica*, Mörch, J. de Conch. xx. p. 313, and Vid. Medd. 1872, p. 21, Nankovri, Nicobar.

Eucalodium walpolcanum, sp. n., = *Cylindrella decollata* (Pfr., in Philippi's Abbild., *nec* Nyst), Crosse, J. de Conch. xx. p. 75, Palenque, province Chiapas, Mexico.

E. deshayesianum, edwardsianum, and *moussonianum,* pp. 223–225, *insigne* and *neglectum,* pp. 301 & 302, Crosse & Fischer, *ibid.*, Mexico, spp. nn.

Cylindrella (Urocoptis) decurtata, sp. n., H. Adams, P. Z. S. 1872, p. 13, pl. 3. fig. 20, Patla, Oaxaca, Mexico [? = *C. truncata,* Philippi; Martens, Mal. Bl. 1865].

C. (Holospira) gealii, sp. n., *id. ibid.* fig. 19, same locality.

Cœlocentrum, g. n., for *Cylindrella turris* (Pfr.), the pillar being a hollow glossy tube, externally ribbed; shell resembling that of *Eucalodium.* Crosse & Fischer, *l. c.* pp. 302 & 303.

Berendtia (Crosse & Fischer, 1869). General shape of shell that of *Clausilia,* but without plaits or clausilium in the interior; jaw very arcuate, with 9 strong ribs; radula with a somewhat smaller tricuspid median tooth and 30 lateral and marginal teeth, the first tri- the latter bicuspid. Generative organs very simple, without accessory appendages; bursa copulatrix with a long stalk. Except the jaw, there are many points of resemblance between *Berendtia* and *Eucalodium.*

Only one species, *B. taylori* (Pfr.) = *Cylindrella newcombiana* (Gabb), on the elevated plains of Lower California. Fischer & Crosse, Moll. terr. et fluv. de Mexico, pp. 300–304.

Clausilia (Nenia) buckleyi, sp. n., Higgins, *l. c.* p. 686, pl. 56. fig. 4, Macas, Ecuador.

Clausilia menelaus and *agesilaus,* spp. nn., Martens, Mal. Blätt. xx. pp. 41 & 42, pl. 2. figs. 3 & 4, Mount Taygetus, both dextral, as is *C. voithi* (Rossm.), from the same locality.

C. græca (Pfr., 1849) redescribed, *id. l. c.* p. 44, pl. 2. fig. 5, Argos.

C. armata (Kutschig, 1846) = *lanzai* (Dunker, 1857) = *cancellata* (Parr., 1868); *C. preseckari* (Parr.) = *semilabiata* (Kuts.); *C. morlachica* (Parr.), very near *itala*; *C. briseis* (Parr.) = *stigmatica* (Ziegl.), var.: *id.* Nachr. mal. Ges. 1872, pp. 9–11.

C. pauli. Animal described by De Folin, J. de Conch. xx. p. 196.

C. plicatula and *nigricans* (Pult.), varr., Jensen (N. Mag. Naturv. ?), pp. 165 & 166 (sep. print, pp. 63 & 64), Brevik, Norway.

C. filograna (Ziegl.), var. n. *sancta,* Clessin, Nachr. mal. Ges. 1872, p. 53, Wettenhausen, S. Bavaria.

The Indian *Clausiliæ* are thus arranged by W. T. Blanford, J. A. S. B. xli. pp. 119–210, pl. 9:—

Sect. 1. *C. cylindrica* (Gray), fig. 1, Western Himalayas, from Western Nepal to Sutlej valley, 5000–9000 ft.

Sect. 2. Medora (H. & A. Ad.): *ios* (Bens.), fig. 2, Sikkim and Butan, 5000–9000 ft.; *bacillum* (Bens.), fig. 3, Khasi and Naga hills, Assam; *ceylanica* (Bens.), fig. 4, Southern Ceylon; *theobaldi,* sp. n., p. 201, fig. 5, Tonghu, Burma.

Sect. 3. Phædusa (H. & A. Ad.); *C. loxostoma* (Bens.), fig. 6, Khasi hills; *ferruginea,* sp. n., p. 202, fig. 7, Naga hills; *asaluensis,* sp. n. (Godwin-Aust. MS.), p. 202, fig. 8, Asalu, North Cachar, 7000 ft.; *fusiformis* (Blanf.), Arakan hills; *gouldiana* (Pfr.), fig. 10, Mergui and Moulmein; *insignis* (Gould), fig. 11, Tavoy; sp. (= *insignis,* Pfr.), fig. 12, Tenasserim provinces; *monticola,* sp. n. (Godwin-Austen, MS.), p. 204, fig. 13, North Cachar, 6500 ft.

Sect. 4. Oospira (sect. n.): shell with 5–6 whorls, more or less oval, apex

blunt; lunule wanting, palatal plaits as in *Phædusa*. *C. philippiana* (Pfr.), fig. 14, Moulmein; *vespa* (Gould), var., fig. 15, Tavoy and Moulmein; *bulbus* (Bens.), Moulmein; *ovata*, sp. n., p. 206, fig. 17, Nattoung, near R. Attaran, Burma.

Sect. 5. ? NENIA (H. & A. Ad.): *C. masoni* (Theobald), fig. 18, between Pegu and Martaban.

Dr. Stoliczka adds some observations concerning some of these species, and adds two new ones, *C. waageni*, ibid. p. 209, fig. 19, Changligalli, Western Himalaya, 9000 ft., and *C. arakana*, sp. n. (Theobald, MS.), p. 210, fig. 20, Arakan.

C. bacillum and *bulbus* (Bens.), *fusiformis* (Blanf.), *masoni* (Theob.), *tuba* (Hanl.), and *ios* (Bens.) figured by Hanley & Theobald, Conch. Ind. pl. 24. figs. 1, 5, 6, 8, 9 & 10.

Pupa amicta (Parr.), from Pisa: Issel, Atti Soc. Ital. xv. 1 (p. 11).

Pupa calpica, sp. n., Westerlund, Nachr. mal. Ges. 1872, p. 27, Gibraltar: allied to *P. michaudi* (Terver).

Pupa æmula (Parr.) described by Martens, Mal. Blätt. xx. p. 49, pl. 3. fig. 6, Athens.

Pupa inornata (Mich.), from S. Bavaria, distinct from *columella* (Benz.), which is fossil [diluvial], and *P. gredleri*, sp. n. (=*inornata*, Gredler), Clessin, Mal. Blätt. xx. pp. 50–58, all figured at pl. 4. figs. 4–10. *P. edentula* (Drap.) is founded on immature specimens, and therefore cannot be specifically maintained.

Pupa klunzingeri, *pleimesi*, *bisulcata*, and *imbricata*, spp. nn., Jickeli, Mal. Blätt. xx. pp. 106 & 107, Hamaszen and Habal, Abyssinia.

P. (*Pupilla*) *debilis*, sp. n., Mousson, Mal. Can. p. 124, pl. 6. figs. 16 & 17 (=Pfeiffer, Nov. Conch. iv. pl. 125), Teneriffe and Palma, Canaries, very near *anconostoma* (Lowe).

P. (*Charadrobia*) *pythiella*, sp. n., *id. l. c.* p. 127, pl. 6. figs. 22 & 23, Hierro and Palma. *P.* (*C.*) *tæniata* and *castanea* (Shuttl.), *id. ibid.* pl. 6. figs. 18 & 19 and 20 & 21 (=Pfeiffer, *l. c.* pl. 125), Canaries.

P. filosa, sp. n., Theobald and Stoliczka, J. A. S. B. xli. pt. 2, p. 333, pl. 11. fig. 8, Arakan.

P. blanfordi (Theobald), Hanley and Theobald, Conch. Ind. pl. 7. fig. 6, Pegu.

P. longurio, p. 158, Curassao, *paitensis*, p. 227 (sinistral), and *fabreana*, p. 359, New Caledonia, Crosse, J. de Conch. xx., spp. nn. *P. mariei* (Crosse, 1871), *id. l. c.* p. 358, pl. 16. fig. 3, New Caledonia.

[*Vertigo*] *Pupa substriata* (Jeffr.), var. n. *sextana*, Gredler, Nachr. mal. Ges. 1872, p. 70, Sexten valley, Tyrol.

Vertigo pachygaster, sp. n. ?, Jensen (N. Mag. Naturv. ?), 1872, p. 171 (sep. print, p. 69), Skien, S. Norway. *V. ovata* (Say): specimens probably belonging to this species from the same locality described, *id. ibid.* p. 170 (68).

Hypselostoma bensonianum (Blant.) and *tubiferum* (Bens.), Hanley & Theobald, Conch. Ind. pl. 8. figs. 2 & 3.

GONIOGNATHA.

Gæotis (Shuttl.). Jaw and radula similar to that of the *Goniognatha*; the jaw divided by more than 40 delicate ribs into

as many plate-like compartments, and the marginal teeth not lateral, more slender than the lateral teeth. Bland & Binney, Ann. Lyc. N. York, x. pp. 252–255, pl. 11. figs. 1–7.

[*Pellicula*] *Succinea appendiculata* (Pfr.). Jaw, exhibiting the type of the *Goniognatha*, described and figured, *iid. ibid.* p. 206, pl. 9. fig. 2.

Amphibulima patula (Brug.). Animal sometimes completely retracted into shell; jaw slightly arcuate, divided longitudinally by about 45 delicate ribs into as many plate-like sections of the same character as those of *Cylindrella* and many species of *Bulimulus*; marginal teeth bicuspid. *Iid. ibid.* pp. 223–225, pl. 11. fig. 8.

Simpulopsis mastersi, sp. n., Brazier, P. Z. S. 1872, p. 619, Ld. Howe's I.

[*Punctum*] *Helix pygmæa* (Drap.). Jaw composed of 19 plates and horseshoe-shaped; radula exhibits the type of *Helix*, consisting of 39 longitudinal and 114 transverse rows of bicuspid teeth; the lateral teeth, except the outermost, do not differ from the median. This species is therefore to be placed among the *Goniognatha*, and probably in *Punctum* (Morse). G. Schako, Mal. Blätt. xx. pp. 178–180, woodcuts.

[*Bulimulus*.] The jaw and radula of *Bulimus guadelupensis* (Brug.) has been examined by P. Fischer: the jaw is simple, with 14–16 scarcely oblique ribs, the innermost narrowest; the teeth exhibit the type of *Helix*, the median having a middle large, and on each side a small lateral point; the lateral teeth are tricuspid, the marginals short and bicuspid, the inner point being the longer. J. de Conch. xx. p. 293. [As this species is, historically, the type of *Bulimulus* (Leach), that generic name must be restricted to the species of which the radula is not very different from that above described, and the species agreeing in the radula with *Orthalicus* must be removed from it.]

[*Bulimulus*] *Bulimus aulacostylus* (Fér.) and *aurissileni* (Born): marginal teeth similar to lateral; jaw membranaceous, in one piece, but divided by delicate ribs into more than 60 plate-like sections, as in *Bulimulus*, *Cylindrella*, &c. Bland & Binney, Ann. Lyc. N. York, x. p. 222.

[*Bulimulus*] *Otostomus loxanus*, sp. n., Higgins, P. Z. S. 1872, p. 685, pl. 56. fig. 2, Loxa, Ecuador.

Bulimulus gabbi, sp. n., Crosse & Fischer, J. de Conch. xx. p. 223, Mexican California: allied to *pallidior* (Sow.).

Orthalicus (*Porphyrobapha*) *buckleyi*, sp. n., Higgins, *l. c.* p. 685, San Lucas, Ecuador.

Cylindrella maugeri (Wood). Variable in colour, which fades even when not exposed to light. The animal always lives on plants, unlike the other *Cylindrellæ*. Gloyne, J. de Conch. xx. pp. 33 & 34.

C. dohrniana (Pfr.): Pfeiffer, Nov. Conch. iv. p. 74, pl. 121. figs. 14 & 15, Jamaica [? = *maugeri*, colour var.].

C. raveni, Curassao, and *tatii*, S. Lucia, spp. nn. (Bland, MS.), Crosse, J. de Conch. xx. pp. 157 & 158.

Elasmognatha.

The known facts as to the lingual dentition of genera and subgenera referred to the subfamily *Succinina* are reviewed by Bland & Binney, Ann. Lyc. N. Y. x. pp. 198–207 (copied figures on pl. 9). *Simpulopsis* (Beck), *Xanthonyx* (Fisch. & Crosse), *Pellicula* (Fischer), and *Succinea appendiculata* (Pfr.) must be removed from that subfamily, if the peculiar form of the jaw be maintained as an essential characteristic.

Hyalimax mauritianus (Rang, 1827, emend.), shell, jaw, and radula described. P. Fischer, J. de Conch. xx. pp. 202–205.

H. reinhardti, sp. n., Mörch, *ibid.* p. 314, and Vid. Medd. 1872, p. 21, Nicobar Islands.

Pellicula convexa (Martens) belongs probably to [*H*]*Omalonyx* (Orb.). Bland & Binney, *l. c.* pp. 203–207.

Succinea putris (L.), var.; jaw figured by Jensen (N. Mag. Naturv.?) 1872, p. 163 (sep. print, p. 61), Norway.

Succinea pfeifferi (Rossm.) not sufficiently distinct from *putris* (L.); found in copulation with it. Maltzan, Arch. Ver. Mecklenb. xxvi. p. 80.

Limnophila.

Auriculidæ.

Pythia scarabæus (L.). Several varieties and an unnamed (? new) species from the Nicobar Islands characterized by Mörch, J. de Conch. xx. p. 322, and Vid. Medd. 1872, p. 25.

Pythia lentiginosa and *perovata*, spp. nn., Garrett, Am. J. Conch. vii. pp. 220 & 221, pl. 19. figs. 4 & 5, Viti Islands.

[*Melampus*] *Persa melanostoma*, sp. n., *id. l. c.* p. 224, pl. 19. fig. 11, Viti Islands.

Plecotrema. Pedipes octanfracta (Jonas, 1845) = *Plecotrema clausa* (H. & A. Adams, 1853). Nachr. mal. Ges. 1862, p. 65.

Plecotrema hirsuta, sp. n., Garrett, *l. c.* p. 219, pl. 19. fig. 2, Viti Islands.

The number of plaits on the left wall of the aperture in *Melampus massauensis* (Ehrenb.), *fasciatus* (Desh.), *luteus* (Q. & G.), *nucleolus* and *siamensis* (Martens) is decidedly variable, and has been observed to be often greatest internally, where it can be seen only after breaking a part of the shell. Jickeli, Nachr. mal. Ges. 1872, pp. 83–87.

Ophicardelus paludosus, sp. n., Garrett, Am. J. Conch. vii. p. 220, pl. 19. fig. 3, Viti, Wallis, and Samoa Islands.

Blauneria leonardi, sp. n., Crosse, J. de Conch, xx. pp. 71 & 357, pl. 16. fig. 4, Noumea, New Caledonia.

LIMNÆIDÆ.

H. DE LACAZE-DUTHIERS distinguishes several lobes of different signification in the cerebroid or postœsophageal ganglion :— first, behind, a lobe destined for the optic, acoustic, and olfactory nerves ; then, in front, a lobe for the issue of the connecting string going to the stomatogastric and penine ganglions, and another for the labial and penine nerves. The pedal ganglions give issue to three pairs of nerves, destined chiefly for the locomotive organs, the columellar muscle, the muscles of the foot, and also for the part of the body behind the head which is exserted when the animal is creeping. Another nervous centre, the inferior or asymmetric ganglion, provides for the mantle and all parts of the body sharing in the tension of the whorls; and the greater size of one of the ganglions of this centre (the 2nd left or the 2nd right) decides the direction of the whorls. [It may be questionable whether the unequal size of the ganglions be the cause or rather the consequence of the dextral or sinistral twisting of the mantle and shell.] There is a peculiar nervous organ, probably of a special sense, near the respiratory orifice, formed by the pallial postvulvar nerve, in which a part of the external skin and the cylindrical epithelium from the outside of the body is, as it were, invaginated into the midst of a nervous ganglion : this invagination is simple in the sinistral genera (*Physa* and *Planorbis*), and double in the dextral (*Limnæa*). The observations are made on *Limnæa stagnalis, auricularia*, and *peregra, Physa fontinalis*, and *Planorbis corneus*. Arch. Z. Par. i. pp. 437–501, pls. 17–20.

Limnæa tumida (Held), from Lake Starnberg, Southern Bavaria, distinguished as a species from *auricularia* (L.) : S. Clessin, Mal. Blätt. xix. p. 113.

L. lagotis, var. n. *solidissima*, Kobelt, *ibid.* p. 77, pl. 2. figs. 17 & 18, Himalaya.

L. traski (Tryon) from Alaska, Martens, *ibid.* p. 79.

Limnæa palmeri, sp. n., Dall, Am. J. Conch. vii. p. 135, Taqui River, Northern Mexico.

Physa tenerifæ, sp. n. (with varr. *fuerteventuræ, palmensis, gomerana*, and *grancanariæ*), and *ventricosa* (Moq. Tand., as var. of *acuta*), sp. n., from the Canaries, distinguished from the European *acuta* (Drap.), by Mousson, Malacol. Can. pp. 137–139.

Physa, a somewhat aberrant form of jaw and radula, in an undetermined species, from Guadeloupe, is described by Bland & Binney, Ann. Lyc. N. York, x. pp. 255 & 256, pl. 11. fig. 9.

Glyptophysa, g. n., like *Physa*, but the shell spirally sculptured and not glossy. *G. petiti*, sp. n., Crosse, J. de Conch. xx. p. 71 (as *Physa*) and pp. 151–153, New Caledonia, and *Physa alicie* (Reeve), Australia.

Amphipeplea glutinosa appears chiefly in March and April : Nyst, Bull. Mal. Belg. vii. p. liii, and Maltzan, Arch. Ver. Mecklenb. xxvi. p. 82.

Planorbis. 13 species of this genus, observed in Bavaria south of the

Danube, are enumerated, and the localities of the rarer of them given by S. Clessin, CB. Ver. Regensb. xxv. pp. 58–64.

P. discus (Parr.) and *acies* (Mühlf.), doubtfully distinct from *vortex* (L.). Maltzan, Arch. Ver. Mecklenb. xxvi. p. 86.

P. reissi, sp. n., Mousson, Malacol. Can. p. 140, Teneriffe; allied to *lævis* (Alder).

P. calathus, trochoideus, cænosus, cantori, sindicus, and *umbilicalis* (Bens.), Hanley & Theobald, Conch. Ind. pl. 39. figs. 1–9, and pl. 40. figs. 1–9, British India.

P. circumspissus (Morelet); *cf.* J. Mabille, R. Z. (2) xxiii. p. 50.

Lantzia, g. n. Animal like that of *Limnæa*; shell of *Simpulopsis*, but with a horizontal plait on the pillar-lip. *L. carinata*, sp. n., Bourbon, at a height of 1200–1300 mm. Jousseaume, R. Z. (2) xxiii. pp. 6–9, pl. 2. figs. 5 & 6. [The shell very similar to that of *Lithotis* (Blanf.) and *Camptonyx* (Bens.).]

Ancylus rupicola ("Shuttl."), sp. n., Mousson, Malacol. Can. p. 141, pl. 6. figs. 34 & 35 (=Pfeiffer, Novitat. Conch. iv. pl. 125), Teneriffe.

Ancylus noumeensis (Crosse, 1871), Crosse, J. de Conch. xx. p. 356, pl. 16. fig. 5, New Caledonia.

Thalassophila.

Gadinia. Dall defends his identification of *Roxellia* (Carp.) with this genus, and substitutes the name *mammillaris* (L.) for *garnoti* (Payr.). Am. J. Conch. vii. pp. 192 & 193.

PULMONATA OPERCULATA.

Cyclophoridæ (Cyclotacea).

Cyclotus campanulatus (Martens), Pfeiffer, Novitat. Conch. iv. p. 51, pl. 118. figs. 19–21, Nagasaki.

Aperostoma, subg. n. *Buckleya*: shell discoidal, keeled, peristome simple; type *A. montezumi*, sp. n., Higgins, P. Z. S. 1872, p. 686, pl. 56. fig. 7, Ecuador.

Pterocyclus mastersi (Blanf.), *cingalensis* (Bens.), *insignis* (Theob.), and *feddeni* (Blanf.). Hanley & Theobald, Conch. Ind. pl. 5. figs. 1, 5, 6, 7 and 9, British India.

P. (*Spiraculum*) *fairbanki* and *andersoni* (Blanf.), and *gordoni* (Bens.), *iid. ibid.* pl. 49. figs. 1–4 and 9, 10, British India.

Pterocyclus labuanensis and *lowianus* (Pfr.) cannot be kept distinct. Martens, Mal. Blätt. xx. p. 157.

Opisthoporus penangensis and *solutus*, spp. nn., Stoliczka, J. A. S. B. xli. pp. 265 & 266, pl. 10. figs. 7 & 8, Pulo Pinang.

Aulopoma hofmeisteri (Troschel), Hanley & Theobald, Conch. Ind. pl. 47. figs. 3 & 4, Ceylon.

Cyclophorus flavilabris (Bens.), *haughtoni, arthriticus*, and *affinis* (Theobald), *polynema* (Pfr.), *balteatus* (Bens.), *patens* (Blanf.), *thwaitesi* and *deplanatus* (Pfr.), figured by Hanley & Theobald, Conch. Ind. pl. 1. figs. 1, 3, 4, pl. 2. fig. 8, pl. 3. figs. 1, 2, 5, 6, and 8–10.—*C. sublævigatus* (Blanf.), *iid. ibid.* pl. 34. fig. 7.—*C. hispidulus* (Blanf.), *cratera, cytopoma, tryblium*, and *pearsoni* (Bens.), *haughtoni* (Theob.), and *affinis*, sp. n., Theobald, *iid. ibid.* pl. 47. figs. 5–10, and pl. 41. figs. 1, 2, and 6. All from British India.

C. malayanus (Bens.) and *borneensis* (Metcalfe), var. from Pulo Penang, described by F. Stoliczka, J. A. S. B. xli. pp. 262–264, pl. 10. figs. 1–5 and 6.

C. charpentieri, var. *nicobarica*, Mörch, J. de Conch. xx. p. 316.—*C. crocatus* (Born, as *Trochus*), with var. β. *turbo* (Chemn., Sow.), and very near *nicobaricus* (Behn) = *trochoides* (Yoldi), Nicobar Islands: *id.* Vid. Medd. 1872, pp. 22 & 23, and *l. c.* pp. 316 & 317.

C. bellus, sp. n., Martens, Mal. Blätt. xx. p. 159, Northern Celebes.

C. (*Craspedotropis*) *galatheæ*, sp. n., Mörch, J. de Conch. xx. p. 316, and Vid. Medd. xi. p. 23, Nicobar Islands.

Leptopoma immaculatum (Chemn.), very near *L. fragile* (Sow.), *id.* J. de Conch. xx. p. 339.

Pupinea.

Megalomastoma sectilabrum (Gould), from Pulo Penang; animal and operculum described by Stoliczka, J. A. S. B. xli. p. 268.

Tomocyclus, g. n., separated from *Megalomastoma* by the peristome being interrupted and notched above. Type *Cyclostoma simulacrum* (Morelet).—*T. gealii*, sp. n., Crosse & Fischer, J. de Conch. xx. pp. 76 & 77, Chiapas, Mexico.

Lagochilus trochoides and *striolatus*, spp. nn., Stoliczka, *l. c.* pp. 270 & 271. In 5 of the 6 known species, a long glandular slit occurs at the upper end of the foot; and from its presence the incision in the apertural margin results. The author remarks that this genus, together with *Dermatocera*, has evidently the same systematic position among the *Cyclostomacea* as the *Zonitidæ* among the *Helicacea*, and proposes therefore a new family, *Lagochilidæ*, p. 269.

L. tomotrema (Bens.), Hanley & Theobald, Conch. Ind. pl. 6. fig. 8, Khasia hills.

Raphaulus pachysiphon, sp. n., Theobald & Stoliczka, J. A. S. B. xli. part 2, p. 329, pl. 11. fig. 1, Moulmein.

Cataulus nietneri, sp. n., G. & H. Nevill, J. A. S. B. xxxix. (1871) pt. 2, p. 7, pl. 1. fig. 7, Ceylon.

Heterocyclus, g. n. Allied to *Cyclophorus* and *Pterocyclus*, but the shell turreted, the last whorl becoming free; operculum cartilagino-corneous, with central nucleus and many whorls, the outer edge of which is raised. *H. perroquini*, sp. n., Crosse, J. de Conch. xx. pp. 156 & 356, pl. 16. fig. 6, New Caledonia.

Pupinopsis morrisonia, sp. n., H. Adams, P. Z. S. 1872, p. 13, pl. 3. fig. 21, Mount Morrison, Formosa.

Pupina aureola, sp. n., Stoliczka, J. A. S. B. xli. p. 267, pl. 10. figs. 11 & 12, Pulo Penang.

Pupina adamsiana (Crosse, 1871) fully described by Crosse, J. de Conch. xx. p. 60, Vanua Levu, Viti Islands: pillar without notch; it belongs therefore to *Hargravesia* (H. Ad.), which is admitted only as a section of *Pupina*.

Diplommatinacea.

Diplommatina angulata and *richthofeni*, spp. nn., Theobald & Stoliczka,

J. A. S. B. xli. part 2, p. 331, pl. 11. fig. 3, Moulmein; some known species of the same country comparatively characterized, *iid. ibid.* pp. 330 & 331.

D. concinna, sp. n., H. Adams, P. Z. S. 1872, p. 13, pl. 3. fig. 22, Borneo.

Alycæus gibbosulus, sp. n., Stoliczka, J. A. S. B. xli. p. 268, pl. 10. fig. 14, Pulo Pinang.

A. kurzianus, sp. n., Theobald & Stoliczka, *ibid.* pt. 2, p. 330, pl. 11. fig. 2, Nattaung, Prome, Burma.

A. (*Charax*) *reinhardti*, sp. n., Mörch, J. de Conch. xx. p. 315, and Vid. Medd. xi. p. 22, Nicobar Islands.

Cyclostomidæ.

Otopoma hinduorum (Blanf.), Hanley & Theobald, Conch. Ind. pl. 6. figs. 5 & 6, Western India.

Cyclostomus adjunctus, sp. n., Mousson, Malac. Can. p. 145, pl. 6. figs. 36 & 37 (= Pfeiffer, Novitat. Conch. iv. pl. 125), Teneriffe. *C. canariensis* (Orb.), from Grand Canary, Teneriffe, Palma, and Lanzarote, separated as a distinct species from *lævigatus* (W. & B.), which is from Gomera: *iid. ibid.* pp. 143 & 144.

Cistula raveni, sp. n., Crosse, J. de Conch. xx. p. 150, Curassao.

Pomatias peguensis (Theobald) and *pleurophorus* (Bens.): Hanley & Theobald, *l. c.* pl. 7. figs. 8 & 10.

Omphalotropis nebulosa, sp. n., Pease, Am. J. Conch. vii. p. 197, Solomon I.

Truncatellidæ.

Truncatella beardsleyana and *pygmæa* (Ad.); habits terrestrial, as in *Geomelania*, to which genus they may therefore be referred. Gloyne, J. de Conch. xx. p. 37.

T. granum, sp. n., Garrett, Am. J. Conch. vii. p. 225, Viti I.

Assimineæ.

Assiminea vitiensis, sp. n., Garrett, Am. J. Conch. vii. p. 224, pl. 19. fig. 14, Feejee Islands, in mangrove-swamps. *Paludinella* [? *Assiminea*] *vitiana*, sp. n., *id. ibid.* fig. 12, Viti I., under stones a little below high-water mark.

Acmella hyalina, sp. n., Theobald & Stoliczka, J. A. S. B. xli. pt. 2, p. 333, pl. 11. fig. 7, Moulmein. Operculum unknown; the distinctness of this genus from *Georissa* and *Hydrocena* asserted, but the difference not stated.

Helicinidæ.

Helicina theobaldiana, sp. n., G. & H. Nevill, J. A. S. B. xxxix. (1871), pt. 2, p. 8, pl. 1. fig. 8, Seychelles.

H. arakanensis (Blanf.), Hanley & Theobald, Conch. Ind. pl. 6. fig. 9.

H. kuehni, sp. n., Pfeiffer, Mal. Blätt. xix. p. 76, pl. 2. figs. 11–13, Surinam.

H. bicincta, sp. n., Gloyne, J. de Conch. xx. p. 47, Upper Amazons River.

H. schrammi, sp. n., Crosse, J. de Conch. xx. p. 212, Guadeloupe.

Georissa fraterna, sp. n., Moulmein, and notes concerning *G. blanfordiana*

(Stoliczka) and *rawesiana* (Bens.): Stoliczka & Theobald, J. A. S. B. xli. pt. 2, p. 332, pl. 11. figs. 5 & 6.

Hydrocena milium (Bens.). Godwin-Austen suggests it may be founded on immature specimens of *Pupa plicidens*: P. Z. S. 1872, p. 515, pl. 30. fig. 3.

SOLENOCONCHÆ.

Dentalium agile, sp. n., = *incertum* (Philippi, Moll. Sicil., *nec* Desh.), allied to *D. abyssorum* (M. Sars), remarkably active in its movements, from the Lofoden Islands, in 200–300 fathoms: Sars, Remark. Forms &c. pp. 31–34, pl. 3. figs. 4–15.

Dentalium gracile (Jeffr., 1870) = *filum* (Sow., 1860), Bay of Biscay and Mediterranean: P. Fischer, J. de Conch. xx. pp. 140–142, pl. 5. fig. 5.

Cadulus minutus, sp. n., H. Adams, P. Z. S. 1872, p. 10, pl. 3. fig. 9, Red Sea.

LAMELLIBRANCHIA.

INCLUSA.

PHOLADIDÆ.

The luminous organs of *Pholas* are formed by ciliated epithelium, containing in its cells the special granular substance which renders the water luminous, and mixes with the mucus which comes from the surface of the animal. They are found under the superior edge of the mantle, and in triangular spots and cords of white colour, standing out in relief on the mantle and siphon. The excretion of this substance can be caused by stimulants; and it becomes luminous by agitation, contact with fresh water, electricity, or heat; the light can be excited and maintained by air and oxygen, even during the putrefaction of the animal, for a long time. This light is monochromatic, like that of *Beroe*, *Pelagia*, &c. P. PANCERI, Q. J. Micr. Soc. (2) xii. pp. 254–260, with a woodcut.

On the boring-instruments of *Pholas candida*, *cf.* Robertson, Rep. Brit. Assoc. 1872.

P. crispata and *candida* (L.) once found at Kiel in rotten wood: Meyer & Möbius, Fauna der Kieler Bucht, ii. pp. 127–133, pl. 21. figs. 1–7 and 8–11.

P. pacifica, sp. n., Stearns, Conch. Mem. vii. (1871), Alameda, San Francisco Bay, California.

Xylophaga dorsalis (Turt.). Some particulars concerning its boring, by Brögger, Bidrag Kristianiafj. moll. Faun. pp. 35–37. Pieces of wood containing this bivalve show outside only many very small holes, 2 millims. broad, clustered together; these holes are continued inwards into hollow radiating tubes, which at first run transversely, then more obliquely, and finally parallel to the fibres of the wood.

Verkrüzen repeats his observations concerning this animal (see Zool. Rec. viii. p. 165) in his journal 'Norwegen, seine Fjorde und Naturwunder,' pp. 35–43, adding figures (pl. 1).

Teredo navalis (L.) found once in the Baltic at Kiel in rotten oak wood, Meyer & Möbius, *l. c.* ii. 134–139, pl. 22.

Gastrochænidæ.

Humphreyia coxi, sp. n., Brazier, P. Z. S. 1872, p. 23, pl. 4. fig. 10, New S. Wales.

Myidæ.

Mya arenaria and *truncata* (L.), both from Kiel, the latter rather rare: Meyer & Möbius, *l. c.* ii. pp. 117–123, pl. 19, and pl. 20. figs. 5–9.

Corbula gibba (Olivi) from Kiel: *iid. l. c.* ii. pp. 114–116, pl. 18. figs. 1–6.

Bothrocorbula, g. n., previously characterized, W. Gabb, P. Ac. Philad. iii. p. 374, pl. 10. fig. 4.

Saxicavidæ.

Saxicava rugosa (L.), from Kiel: Meyer & Möbius, *l. c.* ii. pp. 124–126, pl. 20. figs. 1–4.

Anatinidæ.

Anatina japonica, sp. n., Lischke, Mal. Blätt. xix. p. 107, Bay of Yeddo.

Thracia alciope, sp. n., Angas, P. Z. S. 1872, p. 611, pl. 42. fig. 6, Shark's Bay, West Australia.

Entodesma scammoni, sp. n., Dall, Am. J. Conch. vii. p. 142, pl. 16. fig. 3, British Columbia.

Neæromya, g. n., previously characterized, W. Gabb, *l. c.* p. 274, pl. 10. fig. 4.

Pecchiolia (Meneghini, R. Z. 1852) = *Hippagus* (Philippi, *nec* Lea) = *Verticordia* (S. Wood). *P. abyssicola* (M. Sars, as *Lyonsia*, 1868) described from living specimens found near the Lofoden Islands, Norway, in 120–300 fathoms. Mantle closed, except an oblong ventral aperture for the foot, which is long, subcylindrical, and provided with a byssus; siphons separate, subsessile, the branchial not prominent, with pinnate tentacles and numerous papillæ, the anal prominent, without tentacles. Gills apparently single on each side, but divided by a longitudinal furrow into two transversely plaited parts, the lower of which is the broader. Sars, Remark. Forms &c. p. 25 *et seq.* pl. 3. figs. 21–43.

Solenidæ.

Solen pellucidus (Penn.) from Kiel, Meyer & Möbius, *l. c.* ii. pp. 111 & 112, pl. 18. figs. 6–12.

Siliqua patula (Dixon), California, distinct from *lucida* (Conrad) and *media* (Gray) from Norton Sound: Dall, Am. J. Conch. vii. pp. 140 & 141; the last figured pl. 14. fig. 11.

CARDIACEA.

Tellinidæ.

Soletellina maxta, sp. n., Lischke, Mal. Blätt. xix. p. 107, Bay of Yeddo.

Tellina. Römer has finished his valuable monograph (see Zool. Rec. viii. p. 167), giving a systematic arrangement, full descriptions, critical remarks upon, and very good figures of, a large number of species. The arrangement is as follows :—

Sect. 1. *Musculus* (Mörch): *Tellina radiata* (L.).

Sect. 2. *Tellinella* (Gray): *T. virgata* & *linguafelis* (L.), *perna* (Spengl.), &c.

Subsect. *Arcopagia* (Leach): *scobinata* & *remies* (L.), *crassa* (Penn.), &c.

Sect. 3. *Peronæoderma* (Mörch): *T. punicea* (Born).

Sect. 4. *Peronæa* (Poli): *semiplanata* (Spengl.)=*operculata* (Gmel.), *planata* (L.), *nitida* (Poli).

Sect. 5. *Angulus* (Mühlf.): *lanceolata* (Chemn.), *incarnata* (L.), *exigua* (Poli) [=*tenuis*, Dacosta], *fabula* (Gronov.), &c.

Sect. 6. *Phylloda* (Schumacher): *foliacea* (L.).

Sect. 7. *Tellinides* (Lam.): *timorensis* (Lam.), *sinuata* (Spengl.), *opalina* (Chemn.).

Sect. 8. *Homala* (Mörch): *triangularis* (Chemn.).

Subgen. *Strigilla* (Turt.): *carnaria* (L.).

Subgen. *Tellidora* (Mörch): *crystallina* (Chemn.), *schrammi* (Récl.), *burneti* (Brod. & Sow.).

Subgen. *Metis* (H. & A. Adams): *lacunosa* (Chemn.); *intastriata* [*intusstr-*] (Say)=*gruneri* (Phil.).

Subgen. *Macoma* (Leach): *baltica* (L.).

Sect. 9. *Rexithærus* (Conrad, MS.): *secta* (Conrad).

Subsect. *Tellinungula* (sect. n.) [=*Macalia*, Hanley, 1860]: *T. bruguieri* (Hanl.).

Subgen. *Gastrana* (Schumacher): *abildgaardiana* (Spengl.) = *guinaica* (Chemn.), *polygona* (Chemn.), *fragilis* (L.).

The new species and those not before figured are :—*Tellina disculus* (Desh.), p. 79, pl. 22. figs. 4–6, New Zealand; *salmonea* (Carp.), p. 94, pl. 24. figs. 13–16, California; *simulans* (C. B. Ad.), p. 99, pl. 25. figs. 4–6, Panama; *mellea*, sp. n., p. 135, pl. 30. figs. 4–6, mouth of the Peiho; *flacca*, sp. n., p. 136, pl. 30. figs. 7–9, Red Sea; *erythræa*, sp. n., p. 137, pl. 30. figs. 10–13, Red Sea; *rubra* (Desh.), p. 138, pl. 30. figs. 14–16, Ceylon; *gratiosa*, sp. n., p. 170, pl. 34. figs. 10–12, Indian Seas.

The Linnæan species of *Tellina* are discussed in detail, with doubts as to Hanley's interpretation of *T. angulata*, *albida*, *trifasciata*, and *reticulata*, by E. Römer, in 'Programm der höheren Bürgerschule zu Cassel,' 1871, pp. 1–18.

Tellina baltica (L.) and *tenuis* (Dacosta), from Kiel: Meyer & Möbius, Fauna der Kieler Bucht, ii. pp. 101–105, pl. 16. figs. 14–19 and 11–13.

T. jedoensis and *minuta*, spp. nn., Lischke, Mal. Blätt. xix. p. 106, Bay of Yeddo.

T. (*Strigilla*) *rombergi* (Mörch), Römer, Mon. p. 187, pl. 36. figs. 13–16, Brazil; *maga* (Mörch), *id. l. c.* p. 189, pl. 37. figs. 4–6, Real Llejos.

T. (*Metis*) *turgida* (Desh.), *id. l. c.* p. 210, pl. 40. figs. 7–9, Philippines; *moluccensis* (Martens), *id. l. c.* p. 213, pl. 41. figs. 4–6, Batchian.

T. (*Macoma*) *incongrua* (Martens), *id. l. c.* p. 225, pl. 43. figs. 11–13, Japan; *vesicaria*, sp. n., *id. l. c.* p. 226, pl. 43. figs. 14–16, Guinea; *dissimilis* (Martens), p. 232, pl. 44. figs. 12–14, Japan; *tricostata*, sp. n., p. 235, pl. 49. figs. 10–12,

Gaboon; *prætexta* (Martens), p. 239, pl. 45. figs. 8–10, Japan [the figure much too pale]; *iridella* (Martens), p. 256, pl. 49. figs. 4–6, Japan; *præmitis*, sp. n., p. 257, pl. 48. figs. 7–9, Japan; *capsicum*, sp. n., p. 259, pl. 49. figs. 7–9, Angola.

T. (*Gastrana*) *japonica* (Martens), *id. l. c.* p. 275, pl. 51. figs. 8 & 9, Japan.

Lucinopsis divaricata, sp. n., Lischke, Mal. Blätt. xix. p. 108, Bay of Yeddo.

Semele rubropicta, sp. n., Dall, Am. J. Conch. vii. p. 144, pl. 14. fig. 10, Monterey.

Scrobicularia piperata (Gmelin) [*plana* (Dacosta)], from Kiel: Meyer & Möbius, *l. c.* ii. p. 106–108, pl. 17. figs. 1–6.

S. alba (Wood) [*Syndosmya* of most modern authors], from Kiel: *iid. l. c.* pp. 109 & 110, pl. 17. figs. 7–11.

Mactridæ.

Mactra targionii and *paulucciæ*, spp. nn., Aradas & Benoit, Conch. viv. mar. Sicil. 1870, pp. 28–31, pl. 1. figs. 1 & 2, Aci Trezza and Syracuse, Sicily (*cf.* Zool. Rec. viii. p. 167) [the latter scarcely different from *stultorum* (L.)].

Raeta grayi, sp. n., H. Adams, P. Z. S. 1872, p. 13, pl. 3. fig. 23, Borneo.

Veneridæ.

Cytherea (*Gomphina*) *mærchi*, sp. n., Angas, P. Z. S. 1872, p. 611, pl. 62. fig. 7, locality unknown.

Sunetta aurora, sp. n., Jousseaume, R. Z. (2) xxiii. p. 9, pl. 2. figs. 7–9, China?

Cryptogramma arakana, sp. n., G. & H. Nevill, J. A. S. B. xxxix. (1871), pt. 2. p. 10, pl. 1. fig. 16, Arakan, Penang, and Singapore.

Venus cygnus and *multilamella* (Lam., as *Cytherea*), and *V. casina* (L.), var. 1 (northern), var. 2. *corsicana*, and var. 3. *siciliana*, described and figured, chiefly from fresh specimens found near Catania, by Aradas & Benoit, *l. c.* pp. 57–65, pl. 1. fig. 3, pl. 2. figs. 1–3.

Venus gladstonensis, sp. n., Angas, P. Z. S. 1872, p. 612, pl. 42. fig. 8, Port Curtis, Queensland.

Mercenaria kennicotti, sp. n., Dall, Am. J. Conch. vii. p. 147, pl. 16. fig. 1, Neah Bay, N.W. America.

Katelysia (Röm.). E. Römer fully characterizes this division as a subgenus of *Venus*, and describes as type of it *scalarina* (Lam.), from New Holland. Monogr. Venus, pt. 37, pp. 127 & 128.

Liocyma, g. n., Dall, P. Bost. Soc. xiii. (1870), p. 256, type *Venus fluctuosa* (Gould); *L. becki*, *id. l. c.* p. 257, Greenland; *L. scammoni*, British Columbia, and *L. viridis*, Arctic Ocean, spp. nn., *id.* Am. J. Conch. vii. pp. 145 & 146, pl. 14. figs. 7, 8, & 9; probably also *Tapes arctica* (Reeve).

Tapes. E. Römer slowly continues his valuable monograph of *Venus*. Only two parts, 36 & 37 (pp. 113–128, pls. 36–40), were published in 1872, containing the following species:—

Tapes sinensis (Reeve), *ignobilis* (Anton), *amabilis* (Phil.), pp. 113–115, pl. 38. figs. 2–4: *b*, with smooth shell; *T. pinguis* (Chemn.), *ceylonensis* (Sow.), *kochi* (Phil.), *interrupta* (Koch), *paupercula* (Chemn.), *ambigua* (Desh.), *fumigata* (Sow.), *furcata*, sp. n., Red Sea, pp. 116–120, pls. 38, 39, 40.

Cypricardia spathulata (Souverbie), G. & H. Nevill, J. A. S. B. xxxix. (1871), pt. 2, p. 10, pl. 1. fig. 20, Andaman Islands.

Cyrenidæ.

The ligament, the nacreous prominence bearing the cardinal and lateral teeth, and the teeth themselves are the subject of minute research by S. Clessin (Mal. Blätt. xix. pp. 150–160), who proposes the following two new genera:—

Calyculina. Summits prominent, pointed, tubiform; the cardinal and lateral teeth thin, and not united by a nacreous prominence ("Schlossleiste"). Type *Cyclas calyculata* (Drap.), pp. 158 & 159.

Limosina=*Pisidium*, subg. *Eupera* (Bourg.). Shell very inequilateral, summits approaching the front: pp. 159 & 160.

Corbicula occidentalis (Bens.), var.?=*Venus fluviatilis* (Chemnitz, fig. 321, *nec* Müll., from Canton): Mörch, J. de Conch. xx. p. 342.

C. orientalis (Lam.)=*japonica* (Prime): Prime, Ann. Lyc. N. York, 1872.

Cyrena oblonga (Q. & G.) belongs to *Glauconome*: *id. ibid.*

Pisidium amnicum (Müll.): several varr. described by M. Collin, Bull. Mal. Belg. vii. pp. xcviii–c.

P. henslowianum (Shepp. 1825)=*acutum* (L. Pfr. 1831), exactly described and its varieties and geographical range discussed by S. Clessin, Mal. Blätt. xix. pp. 66–71, pl. 1. fig. 4. *P. pusillum* (Gmel.), *milium* (Held)=*roseum* (Jeffreys *nec* Scholtz), and *supinum* (A. Schmidt), described by Clessin in 1871, are figured *ibid.* pl. 1. figs. 1, 2, & 3. *P. scholtzi*, sp. n., Breslau, Silesia, a variety from Lapland, *P. roseum* (Scholtz), *casertanum* (Poli), from Palermo, and *ibericum*, sp. n., from Barcelona, described and figured, *id. l. c.* xx. pp. 21–30, pl. 1. figs. 1–4. The shape of the teeth in this genus is best seen from above.—*P. baudoni*, sp. n., = *henslowianum* of Baudon (*nec* Shepp.), N. France, *P. intermedium* (Gassies), from various localities in S. Germany, *P. subtruncatum* (Malm), of which *P. dupuyanum* (Normand) is only a var., Sweden, France, and Germany, and *P. amnicum* (Müll.), with several varr., including one named *malmi*, from Sweden: *id. ibid.* pp. 83–92.

P. dubrueili, sp. n., Baudon, Rev. Montp. i. pp. 1–4, pl. 3, St. Félix, dép. de l'Oise.

P. arciforme (Malm), var., Jensen (N. Mag. Naturv.?), 1872, p. 178 (sep. print, p. 76), pl. 1. figs. 8 & 9, Arendal, S. Norway.

P. canariense (Shuttl.), Mousson, Malacol. Can. p. 149, Teneriffe.

P. clarkeanum, sp. n., G. & H. Nevill, J. A. S. B. xxxix. (1871), pt. 2, p. 9, pl. 1. fig. 4, Damuda, East India.

Cardiidæ.

Cardium edule (L.) and *C. fasciatum* (Montagu), from Kiel: Meyer & Möbius, Fauna &c. ii. pp. 87–91, pl. 14, and pl. 13. figs. 1–5.

C. minimum (Phil.)=*suecicum* (Reeve), ribs vary from 28–33: Brögger, Bidr. Kristianiafj. moll. faun. p. 32.

C. (*Ctenocardia*) *victor*, sp. n., Angas, P. Z. S. 1872, p. 612, pl. 42. fig. 9, Mauritius.

C. (*Serripes*?) *laperousii* (Desh.), Sitkha, distinct from *S. grœnlandicus* (Chemn.): Dall, Am. J. Conch. vii. p. 148.

Chamidæ.

Chama inermis, sp. n., Dall, *l. c.* p. 148, Central America.

MYTILACEA.

Kelliidæ.

A list of the known species of this family by W. Tryon, P. Ac. Philad. iii. pp. 230–234.

Montacuta bidentata (Mont.), from Kiel: Meyer & Möbius, Fauna &c. ii. pp. 85 & 86, pl. 13. figs. 6–11.

Montacuta ferruginosa (Mont.)=*tenella* (Lovén); on its distribution on the coast of Norway, Brögger, Bidr. Kristianiafj. moll. faun. p. 31.

Turtonia occidentalis, sp. n., Dall, *l. c.* p. 150, pl. 14. fig. 12, Plover Bay, Eastern Siberia.

Astartidæ.

A list of the known species of this family by W. Tryon, P. Ac. Philad. iii. p. 248–258.

Cyprina islandica (L.), from Kiel: Meyer & Möbius, *l. c.* ii. pp. 92–94, pl. 15.

Astarte sulcata (Dacosta), varr., Brögger, *l. c.* p. 33.

A. borealis (Chemnitz) [=*arctica* (Gray)], from the western part of the Baltic; *A. sulcata* (Dacosta) and *compressa* (Montagu), from Kiel: Meyer & Möbius, *l. c.* ii. pp. 95–100, pl. 16. figs. 1–4, 5–7, and 8–10.

Rictocyma [*Rhectocyma*], subg. n. of *Astarte*; sculpture consisting of broken nodulose waves, irregularly concentric. *R. mirabilis*, sp. n., Dall, *l. c.* p. 151, pl. 14. fig. 6, Unga, Shumagin Isles, N.W. America.

Cardita raouli, sp. n., Angas, P. Z. S. 1872, p. 613, pl. 42. fig. 12, Cape Raoul, S. Tasmania.

Ceropsis, subg. n. of *Cardita*. Right valve with a triangular cardinal tooth, left with a stout anterior and slender posterior cardinal tooth, diverging, and a very slight groove in the posterior margin; no lateral teeth. *C. minima*, sp. n., Dall, *l. c.* p. 152, pl. 16. figs. 5 & 6, Monterey, associated with *Haliotis rufescens* (? byssiferous).

Unionidæ.

Unio crassus (Retz), a thick and short variety, yielding pearls, found in the river Aller, Sleswig, described by Kobelt, Mal. Blätt. xix. pp. 142–147, pl. 5.

U. pictorum (L.), var. *decollata* (Held), with subvar. *arca* (Held), in lake of Starnberg, the Ammersee and Chiemsee, S. Bavaria. Clessin, *ibid.* p. 123.

U. lauleyanus (Gentil.)=*villæ* (Stabile), var.: Issel, Atti Soc. Ital. xv. pt. 1, p. 18.

U. fiscallianus, sp. n., Kleciach, Dalmatia, has the same relation to *U. elongatulus* (Mhlfld.) as *U. platyrhynchus* (Rossm.) to *pictorum*. Kobelt, *l. c.* xx. pp. 92–95, woodcut.

U. marginalis (Lam.), *lamellatus* (Rv.), and *corrugatus* (Müll.). Critical remarks on their numerous varieties, by Hanley & Theobald, Conch. Ind. pp. 5, 20, 21, pls. 9, 42, 43, 44, & 45. *U. smaragdites* (Bens.), *iid. ibid.* pl. 10. fig. 5a. Assam; *U. pinax*, *plagiosoma*, and *chrysis* (Bens.) = *favidens*, varr., pl. 11. figs. 2 & 3, pl. 41. fig. 3; *U. trirostris* (Bens.), pl. 11. fig. 6, Moradabad; *U. pachysoma* (Bens.), pl. 12. fig. 1, Assam; *U. theca* (Bens.), pl. 12. fig. 5, Bundelkund; *U. lioma* (Bens.), pl. 12. fig. 6, near Bombay; *U. jenkinsianus* (Bens.), pl. 41. fig. 3, Assam; *U. birmanus* (Blanf.), pl. 42. fig. 1, Bhamo; *U. foliaceus* (Gould) = *peguensis* (Anthony), pl. 42. fig. 3, Birmah and Pegu; *U. marcens* (Bens., Hanl.), pl. 42. figs. 4–6, Assam; *U. crispatus* (Gould), pl. 45. fig. 1, Birmah; *U. tennenti*, new name for *Mya corrugata* (Wood *nec* Müller), Hanley, *ibid.* pl. 45. figs. 7–9, Ceylon?; *U. generosus* (Gould.) pl. 46. figs. 4 and 6, Pegu.

Monocondylea tumida (Morelet) figured by J. Mabille, R. Z. (2) xxiii. p. 51, pl. 5. figs. 6 & 7, Cambodia.

Alasmodon margaritifera (L.): some notes on its anatomy and pearls, by R. Garner, P. L. S. xi. pp. 426–428.

Alasmodonta nicobarica (O. Fabr., MS.), sp. n., Mörch, J. de Conch. xx. p. 327, and Vid. Medd. 1872, p. 29, Nicobar Islands, allied to *A. zollingeri* (Mouss.).

Anodonta. S. Clessin comes to the conclusion that all the forms found in mid-Europe, and usually distinguished as separate species, are dependant on the quality of the water and soil in and on which they live, and can be raised by transferring living specimens to the proper water. *A. cygnea* (L.) is the form occurring in stagnant water with muddy bottom; *cellensis* (Schröt) in the like, with a little, and *A. rostrata* (Kokeil) with very abundant, vegetable mould and earthy sediment; *A. piscinalis* (Nilss.) in tranquil creeks of rather large rivers; *A. ponderosa* (Pfr.) in the like, with plenty of lime; *A. anatina* (L.) in the current of small streams; *A. lacustris* (Held) in Alpine lakes with lime bottom; and *A. complanata* (Ziegl.), an abnormality occurring singly among the others. CB. Ver. Regensb. xxvi. pp. 82–97.

A. anatina (L.), var. n. *lacustris*, from several lakes in S. Bavaria, with subvar. *rostrellata* [*rostell-*], from lake Starnberg, and subvar. *callosa* (Held) from the Chiemsee. Clessin, Mal. Blätt. xix. pp. 119–122.

A. cygnea (L.) and *piscinalis* (L.): their specific distinctness defended by H. v. Maltzan, Arch. Ver. Mecklenb. xxvi. pp. 91 & 92.

Mytilidæ.

Mytilus edulis (L.) spawns on the northern coast of Germany in April and May, and is used as food by the lower classes, chiefly when other provisions are scarce. A. Metzger, JB. Ges. Hannov. xx (1871), p. 29.—The same, from Kiel, figured by Meyer & Möbius, Fauna &c. ii. pp. 73–77, pl. 11: fig. 5 represents the comparative thickness of English and Baltic specimens; fig. 6

a very young shell, in which the summits are above the anterior end, as in *Modiola*.

Modiola aterrima, sp. n., Dall, Am. J. Conch. vii. p. 154, Bay of Yeddo.

Modiolaria discors (L.), *nigra* (Gray), and *marmorata* (Forbes), from Kiel: Meyer & Möbius, *l. c.* ii. pp. 78–84, pl. 12. figs. 4–9, 1–3, and 10–13.

M. denticulata, sp. n., Dall, *l. c.* p. 154, Acapulco.

Aviculidæ.

Avicula is monographed (in Küster's new ed. of Martini & Chemnitz) by Prof. W. Dunker, who introduces a number of new species (rather too many for a genus, the species of which are so variable), but maintains as identical the pearl-oysters of the Indian and Caribbean seas, under the common name *A. margaritifera* (L.), the older literature of which is more fully quoted than the recent. The figures are partly original. The new species and those figured for the first time are :—

Avicula scheepmakeri, sp. n., p. 6, pl. 1. f. 1 ; *reentsi*, sp. n., p. 9, pl. 2. figs. 1 & 2, Red Sea; *lichtensteini* (Dkr.), p. 10, pl. 2. f. 3, Sandwich Islands; *horrida*, sp. n., p. 11, pl. 2. f. 4, Venezuela ; *grisea*, sp. n., p. 11, pl. 2. f. 5; *longisquamosa*, sp. n., p. 12, pl. 2. f. 6, Venezuela; *badia* (Dkr.), p. 12, pl. 2. f. 7; *fimbriata* (Dkr.), p. 13, pl. 3. f. 2 & 6, Central America; *atripurpurea* (Dkr.), p. 14, pl. 3. f. 3; *citrina* (Dkr.), p. 14, pl. 3. f. 4 ; *tamsiana* (Dkr.), p. 15, pl. 4. f. 1 & 2, Venezuela; *olivacea*, sp. n., p. 17, pl. 4. f. 5, Antilles ; *varia*, sp. n., p. 17, pl. 4. f. 6, Red Sea ; *serrulata* (Dkr. 1848)=*lata* (Gray, in Reeve, 1857), p. 18, pl. 5. f. 1 & 2, Moluccas ; *venezuelensis*, sp. n., p. 19, pl. 5. f. 3, Venezuela ; *nigrifusca*, sp. n., p. 20, pl. 5. f. 4 ; *peasii*, new name for *radiata* (Pease, *nec* Leach, *nec* Phil.), p. 24, pl. 8. f. 1, Kingsmill Islands; *physoides* (Lam.), p. 25, pl. 8. f. 2 & 3, West Australia ; *cypsellus*, sp. n., p. 25, pl. 8. f. 4, Indian sea ; *straminea* (Dkr.), p. 26, pl. 9. f. 1, Indian seas ; *cochenhausi*, sp. n., p. 27, pl. 9. f. 3, China ; *spadicea* (Dkr. 1852)=*rutila* (Reeve), p. 31, pl. 10. f. 1 & 8, Red Sea ; *hyalina* (Dkr. 1852)=*sculpta* (Reeve), p. 32, pl. 10. f. 3 & 4, Tasmania ; *japonica* (Dkr.), p. 33, pl. 10. f. 5, Japan ; *cornea* (Dkr.), p. 33, pl. 10. f. 6, locality unknown ; *tortirostris* (Dkr.), p. 37, pl. 11. f. 6, Java ; *tristis*, sp. n., p. 44, pl. 14. f. 3; *reeviana*, new name for *fimbriata* (Reeve, 1857, *nec* Dkr. 1852), p. 45 ; *pallida*, sp. n., p. 49, pl. 15. f. 4 ; *gruneri*, sp. n., p. 51, pl. 18. f. 1 ; *concinna*, sp. n., p. 52, pl. 18. f. 2 ; *prasina*, sp. n., p. 53, pl. 18. f. 4 ; *atrata*, sp. n., p. 55, pl. 19. f. 1 ; *brevialata*, sp. n., p. 55, pl. 19. f. 3, Amboina ; *plicatula* (Dkr.), p. 56, pl. 19. f. 4. In all, 71 species, of which 32 are named by Dunker himself, 28 by Reeve, and only 11 by other authors.

Perna hawaiiensis, new name for *californica* (Conrad), which implies an erroneous locality : Pease, Am. J. Conch. vii. p. 25.

OSTREACEA.

Arcidæ.

Scapharca pygmæa, sp. n., H. Adams, P. Z. S. 1872, p. 11, pl. 3. f. 15, Red Sea.

Anomalocardia transversalis, sp. n., *id. l. c.* fig. 16, Red Sea.

Scaphula bensoni, sp. n., *id. l. c.* p. 14, pl. 3. f. 24, locality unknown.

Pectunculus albilineatus, sp. n., Lischke, Mal. Blätt. xix. p. 109, Bay of Yeddo.

Axinæa fringilla, sp. n., Angas, P. Z. S. 1872, p. 612, pl. 42. fig. 10, Port Curtis, Queensland.

Pectunculus montrouzieri, sp. n., *id. l. c.* p. 613, pl. 42. f. 11, New Caledonia.

NUCULIDÆ.

Nucula rabaniana, sp. n., G. & H. Nevill, J. A. S. B. xxxix. part 2, p. 9, pl. 1. f. 11, Pooree, Bay of Bengal, and Penang.

Yoldia obtusa (M. Sars)=*abyssicola* (M. Sars, 1858, *nec* Thorell, 1868), Herlofjord, near Bergen, Norway, 300 fathoms: Sars, Remark. Forms, &c. pp. 23–25, pl. 3. figs. 16–20.

Y. seminuda, sp. n., Dall, Am. J. Conch. vii. p. 153, Radiak [Kadiak?], N.W. America.

SOLEMYIDÆ.

A list of the known species by W. Tryon, P. Ac. Philad. iii. p. 258.

PECTINIDÆ.

Pecten septemradiatus (Müll.), var. n. *crebricostatus*, Brögger, Bidrag &c. p. 28, pl. 1. figs. 1–5, Christiania Fjord.

Pecten (*Pseudamusium*?) *alaskensis*, sp. n., Dall, Am. J. Conch. vii. p. 155, pl. 16. fig. 4, Alaska Territory.

P. (*Pleuronectia*) *lucidus*, sp. n., from the deep-dredgings in the West Indies, indicated, but not described, by Jeffreys, J. de Conch. xx. p. 287.

Lima excavata (F. C. Fabr.) dredged in the Hardangerfjord, *hians* (Gmel.), *loscombii* (Sow.), *subauriculata* (Mont.), and *elliptica* (Jeffr.) described from the living animals, with an account of their occurrence and of the nest built by *L. hians*, by Verkrüzen, Mal. Blätt. xix. pp. 133–139.

SPONDYLIDÆ.

Spondylus wrightianus, sp. n., Crosse, J. de Conch. xx. p. 360, Nichol Bay, Australia.

OSTREIDÆ.

Ostrea edulis (L.). Oysters are found at Wangeroog, Juist, and other islands on the shore of East Friesland, scattered in a depth of from 16 to 18 fathoms, in extended banks only between 20 and 23 fathoms. The shallower grounds are unfavourable for them, on account of the currents and the driving sand. They begin to spawn in the middle of July. On the larger banks, their shells are beset with *Balanus percatus* and *Verruca strœmia*, and in other localities with *B. crenatus*. Metzger, JB. Ges. Hannov. xx. 1871, pp. 28 & 29.—An account of oyster-breeding in France and England, containing many statistical, topographical, and other particulars, has been published by A. TOLLE (Die Austernzucht und Seefischerei in Frankreich und England. Berlin: 1871, 4to, 24 pp., plates).

Communications on oyster-breeding in South-western France, by L. Soubeiran, Austchysky, and Rochebrune, Congr. Sc. Bordeaux, 1872.

Ostrea palmipes (Sow. in Reeve) = *pauluccia* (Crosse, 1869): Crosse, J. de Conch. xx. p. 123.

Anomiidæ.

E. S. Morse has observed that the very young shell of *Anomia* is rather regular and imperforate, and that the perforation begins at the lower margin of the right shell as a notch caused by the issue of the byssus, which, being afterwards encircled by the new growth of the shell, becomes finally a foramen, and is pushed by further growth nearer the umbones. Am. Nat. v. Sept. 1871, and P. Bost. Soc. xiv.

MOLLUSCOIDA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

ALLMAN, G. J. On the Structure of (*Edwardsia*) *Cyphonautes* &c. Rep. Br. Ass. 1872, and Q. J. Micr. Soc. (2) xii. pp. 395–397.

DALL, W. H. Supplement to the Revision of the Terebratulidæ, with additions, corrections, and a revision of the Craniidæ and Discinidæ. Am. J. Conch. vii. (1871) pp. 39–85, pls. 10 & 11.

FOL, H. Études sur les Appendiculaires du détroit de Messine. Mém. Soc. Phys. Genèv. xxi. pt. 2, pp. 445–498, 11 pls., gr. 4to (also as separate print).

A short extract of it in Arch. Z. expér. i. pp. lvii–lix, and J. Zool. i. pp. 525–528.

GIARD, A. Étude critique des travaux d'embryogénie relatifs à la parenté des Vertébrés et de Tuniciers. Arch. Z. expér. i. pp. 233–235 and 397–428.

——. Recherches sur les Ascidies composées ou Synascidies. *Ibid.* pp. 613–662, pls. 21–30.

HARTMANN, R. Einiges über den Bau von *Halodactylus diaphanus*. Arch. Anat. Phys. 1871, pp. 489–529, pls. 13 & 14.

HERTWIG, O. Untersuchungen über den Bau und die Entwicklung des Cellulose-Mantels der Tunicaten. Jen. Z. Nat. vii. (1871) pp. 46–73, pls. 4–6.

HERTWIG, R. Beiträge zur Kenntniss des Baues der Ascidien. *Ibid.* pp. 74–102, pls. 7–9.

KUPFFER, C. Zur Entwicklung der einfachen Ascidien. Arch. mikr. Anat. viii. pp. 358–396, pl. 17.

METSCHNIKOFF, ELIAS. Zur Entwicklungsgeschichte der einfachen Ascidien. Z. wiss. Zool. xxii. pp. 339–347, woodcuts.

PAVESI, P. On the Circulation of the Blood in *Pyrosoma*, especially as observed in the embryo. Q. J. Micr. Soc. (2) xii. pp. 275–283, pl. 12.

SARS, G. O. On some remarkable forms of Animal Life from the great deeps off the Norwegian coast.—Part I. Partly from posthumous manuscripts of the late Prof. MICH. SARS. University-Programme. Christiania: 1872, 4to, 82 pp., 6 pls.

CONTRIBUTIONS TO FAUNAS.

17 species of *Bryozoa* and a few *Tunicata*, observed on the coast of Northern Germany, are enumerated by A. Metzger, JB. Ges. Hannov. xxi. (1871), pp. 26 & 27.

A. Giard gives a descriptive list of *Ascidiæ* observed by him at Roscoff, on the coast of Brittany: Arch. Z. Par. i. pp. 404–406 and 613–662.

3 species of *Bryozoa*, *Tendra zostericola* (Nordm.), *Lepralia malusi* and *foraminifera* (*auct. null.*), and 4 *Tunicata*, *Phallusia intestinalis*, *Cynthia microcosmus*, *Botryllus roseus*, and *Appendicularia cophocerca*, have been hitherto observed living in the Black Sea: ULIANIN, 'Materials for a Fauna of the Black Sea' (in Russian). Moscow: 1872, pp. 79 & 88.

The *Terebratulidæ* of the N. Pacific enumerated, and some new *Tunicata* from thence described by Dall, Am. J. Conch. vii. pp. 156–159.

BRACHIOPODA.

Dall (*l. c.* pp. 39–59, pl. 10) is convinced that the homologies between the Brachiopods and Annelids are only superficial.

For corrections of and additions to the former revision of the genera and species of Brachiopods (Zool. Rec. vii. p. 182), *cf. id. ibid.* pp. 60–84, pl. 11.

TEREBRATULIDÆ.

Terebratula cubensis (Pourtalès) distinct from the European *vitrea* (Born): Dall, *ibid.* p. 61.

Terebratulina cailleti (Crosse). New localities in the West Indies, and some remarks concerning its form, perhaps = *michelottina* (Davidson): *id. ibid.* pp. 61 & 62.

Agulhasia (King) may be a young state of any *Terebratulina*, and at most should only be considered a subgenus: *id. ibid.* pp. 62 & 63.

Gwynia (King) *capsula* (Jeffr.) is perhaps also the immature stage of a known *Terebratula*: *id. ibid.* p. 64.

Waldheimia raphaelis (Dall), *septigera* (Lovén), *floridana* (Pourtalès), and *septata* (Lovén) all distinct from one another, the last a *Terebratella*: *id. ibid.* pp. 63 & 64.

Terebratella transversa (Sow.) = *caurina* (Gould), *id. ibid.* p. 64; *T. rubigi-*

nosa, new name for *suffusa* (Dall, Am. J. Conch. vi., *nec* Reeve): *id. ibid.* p. 65.

Magasella gouldi, sp. n., *id. ibid.* p. 67, pl. 11. fig. 11, Hakodadi, Japan.

M. aleutica, sp. n., *id.* P. Cal. Ac., Dec. 1872, Aleutian Islands.

Kraussia rubra found in groups, of all ages, fixed on the stems of large *Algæ* at the Cape of Good Hope. Gray, Ann. N. H. (4) x. pp. 152 & 465.

Frenula jeffreysi, described as new genus by Dall, Am. Nat. v. (1871), p. 55, is very probably founded on a specimen the septum of which was broken away, and may belong to the section *Ismenia*, of the genus *Megerlia*: Dall, Am. J. Conch. vii. p. 65, pl. 11. figs. 7–10.

Platidia davidsoni (Eudes-Deslongchamps), hitherto only known from the Mediterranean, has been found on the Atlantic coast of France, near Cape Breton, and is accurately described by P. Fischer, J. de Conch. xx. pp. 160–164, pl. 6. The perforation lies only in the dorsal valve, the ventral being provided with a rather projecting summit, with the deltidium behind the perforation, in opposition to the other articulated Brachiopods. The peduncle is very much shortened; and the dorsal valve comes into immediate contact with the substance to which the animal is attached, resembling in this respect the perforated valve of *Anomia*.

Megathyris (Orb.). The description of the soft parts amended, and some specific synonyms added, by Dall, *l. c.* p. 68.

Rhynchonellidæ.

Characters of the soft parts amended, Dall, *ibid.* p. 69.

Cryptopora gnomon (Jeffreys, Nature, 1869, i. p. 136), = *Atretia*, g. n. (Jeffr. P. R. Soc. 1869), belongs probably to the genus *Dimerella* (Zittel, 1870); it was found west of Ireland, at about 1000 fathoms? Dall, *fide* Jeffreys, Am. J. Conch. vii. pp. 70 & 71.

Craniidæ.

A synopsis of the genera, mostly fossil, and of the five recent species, belonging to *Crania* proper, given by Dall, *l. c.* pp. 71–73. It agrees very nearly with that published in Bull. Mus. C. Z. iii. (see Zool. Rec. viii. p. 176).

Discinidæ.

A similar synopsis of this family: *id. ibid.* pp. 74–77.

Lingulidæ.

Glottidia. The laminæ supporting the posterior retractor or adjustor muscle are the internal, not the postparietals. To this genus belongs *Lingula pyramidata* (Stimps.), studied in the living state by E. Morse, and *G. palmeri*, sp. n., Gulf of California. Dall, *l. c.* pp. 77, 78, & 54.

TUNICATA.

Ascidiidæ.

According to O. Hertwig's researches, the mantle of the *Tunicata* is composed of three layers:—1. The outer or *tunica externa*, known to contain cellulose, is originally a homogeneous cuticular formation (not a permanent membrane of the egg), at first without cells, and remaining so in *Doliolum* and *Appendicularia*, but in the *Ascidia* becoming afterwards real conjunctive or cellular tissue by "immigration" of cells from within. 2. The intermediate layer, consisting of epithelial cells, arranged in a simple continuous stratum, to which in *Phallusia* semifluid cellular tissue is added. The intercellular substance of this layer is either homogeneous, with star-shaped and vesicular cells, as in *Phallusia*; or fibrous, with spindle-shaped cells, and others smaller and filled with pigment. This layer corresponds to the epidermis of other animals; and the "polygonal epithelium" in the mantle of the *Ascidia* of other authors belongs to it. 3. The internal skin of the body, *tunica interna*. At both openings of the body the external layer is somewhat continued inwards over the internal. The same cellulose tissue is also found in the muscular bag and in the intestine of *Cynthia mytiligera*. The muscular system consists of crossing, smooth muscular fibres—viz. two strata of longitudinal fibres, and an intermediate stratum of transverse fibres. The blood-vessels situated in the interstices of these fibres have no proper walls, and take their origin from the internal layer, like the stolones at the base of the mantle. Jen. Z. Nat. vii. (1871), pp. 46–73, pls. 7–9.

R. Hertwig's anatomical researches have been directed chiefly to the perithoracic cavity, endostyle and abdominal canal, intestine and liver of the *Ascidia*. The endostyle is provided n the middle of its base with cilia, and is regarded as constituting, with the abdominal canal, a sensitive organ, although no nerves have as yet been detected in it. The numerous cylindrical tubes surrounding the intestine, which have been regarded as biliary vessels or liver by Prof. Krohn, are blood-vessels, according to the author; and the honey-yellow organ described by Krohn is the renal organ or kidney. The true liver is a glandular appendage of the stomach, and has been already correctly described and recognized by Savigny in *Cynthia*, but afterwards mentioned only by Milne-Edwards. *Ibid.* pp. 74–102, pls. 7–9.

A. Kowalewsky's paper cited in Zool. Rec. viii. p. 176, treats chiefly of the development of *Phallusia mammillata* (Cuv.).

C. Kupffer observes that in *Molgula affinis, simplex* (A. H.), and a new species, there is no larval stage, but the animal,

as soon as hatched from the egg, shows all the essential features of the full-grown stage, to which the development progresses within the egg. He also remarks that the same animal produces either single isolated eggs or a sort of spawn, between the individual eggs of which and the isolated eggs no difference can be observed. The author thinks this simple development may be regarded as the typical one of the *Tunicata*, and that in the *Ascidia* it begins much in the same manner, but becomes complicated by the known peculiarities of the larva, which put it in relation with the *Vertebrata*—the latter diverging course of development, however, being abruptly stopped, and the animal falling back to the inferior organization, which is never exceeded by either of the above-mentioned species of *Molgula*. Arch. mikr. Anat. viii. pp. 364–384, pl. 17. figs. 1–8.

The same author, discussing in detail the nervous system of the larva of *Ascidia*[*-ium*] *mentula* (Müll.), describes a light-breaking apparatus, and an otolite supported by cilia, in the anterior cavity, which he calls the cerebral vesicle (Hirnblase). He compares the fold of the inner membrane of this cavity, which surrounds and fixes the light-breaking body, with the *zonula zinni* in the human eye, and describes equidistant bundles of what he calls *spinal nerves* along the nervous trunk running above the chord in the tail of the larva. These nerves, however, can only be seen distinctly for a few seconds after the death of the animal. *Ibid.* pp. 385-396, pl. 17. figs. 9 & 10; the optic apparatus, fig. 10, *l*; the otolite and its cilia, fig. 10, *c* and *e*; the "spinal nerves," fig. 9, *s*.

E. Metschnikoff, having repeated his researches concerning the first development of the *Ascidia*, agrees with Kowalewsky that the first germinal layer (erstes Keimblatt) shares in the formation of the nervous system, and that the horseshoe-shaped organ is the matrix of the cellular string of the tail; but he maintains that the second or inferior germinal layer (zweites Keimblatt) also shares in such formation, and he proves it from the figures drawn by Kowalewsky himself. The cells of the tunic come directly from the protoplasm of the egg-cell (this is also the opinion of C. Kupffer). All this can be observed very distinctly only in species with pellucid eggs, as *Phallusia mammillata* (Sav.); and the contradictory results of the researches of Kupffer, Ganin, and Dönitz are due to their having been obtained from less favourable species. Z. wiss. Zool. xxii. pp. 339–347.

A. Giard reviews the recent publications on the structure of Ascidian larvæ and their relation to the type of the Vertebrates. Although differing in some points from the views brought forward by Dönitz (see Zool. Rec. vii. p. 184), he comes to the conclusion that the resemblance of the chord in the tail with that of the Vertebrate is only an homology by adaptation

[analogy], not by atavism, and that the true conformity of development goes no further than the formation of Rusconi's cavity and the dorsal furrow within the egg. Arch. Z. expér. i. pp. 233–285. He also discusses the last paper by C. Kupffer (see above), and brings forward several objections to that author's conclusions. *Ibid.* pp. 397–428.

H. Fol states that the cloaca in the *Ascidia* is due to a double invagination of the ectothelium, not merely to a hollow space between the strata of the skin, and that the endostyle is uniform in all *Tunicata*. Mém. Soc. Phys. Genèv. xxi. pt. 2 (sep. print, pp. 6 & 7).

Lacaze-Duthiers recapitulates the researches of Kowalewsky, Kupffer, and others (Zool. Rec. vii. pp. 183 & 184, viii. p. 176) concerning the development of the Ascidians, in a very instructive paper, Arch. Z. expér. 1872.

Another abstract of the same, illustrated by a plate containing figures copied from Kupffer's paper of 1870, is given in J. Zool. i. pp. 187–192, pl. 12.

Molgula macrosiphonica, sp. n., C. Kupffer, Arch. mikr. Anat. viii. p. 309 (pl. 17. figs. 1–8, egg and young state), Kiel. This species and *M. affinis* (A. H.) have no larval stage (see above), although in the longitudinal plaits of the branchial sac and the simple mass of the genital organ they resemble the other species of *Molgula*, and not any of the genus *Eugyra*, in which, according to A. Hancock (see Zool. Rec. vii. pp. 184 & 185), the larval stage is wanting. Kupffer, *ibid.* pp. 358–369; abstracted, with critical remarks, by Giard, Arch. Z. expér. i. pp. 397–404.

M. adhærens, sp. n., Giard, *l. c.* i. p. 405, Roscoff, Brittany.

Lithonephrya, g. n., near *Molgula*. Tail of the larva as long as its body, which contains a reddish concretion. *Molgula complanata* (A. H.) and *L. decipiens*, sp. n., Roscoff: Giard, *ibid.* p. 405.

Gymnocystis, g. n. Fixed, gregarious, with transparent shell; larva with amœboid appendages; its tail thrice as long as its body. *G. comosa*, sp. n., Roscoff: *id. ibid.* pp. 403 & 406.

Cynthia montereyensis, sp. n., Dall, Am. J. Conch. vii. p. 157, Monterey.

Boltenia beringi, sp. n., *id. ibid.*, St. Paul's Island, Behring Sea.

Clavelinidæ.

Clavelina lepadiformis (Müll.). Several varieties of it observed at Roscoff by A. Giard, *l. c.* pp. 613 & 614.

Botryllidæ.

The aggregated and compound *Ascidia* of the north coast of France are arranged by A. Giard in the following manner:—

Section 1. Catenatæ.

Tribe 1. Clavelinidæ: *Clavelina*.

Tribe 2. Perophoridæ: *Perophora*.

Tribe 3. Botryllidæ: *Botryllus*, *Botrylloides*.

Section 2. Glomeratæ.

Tribe Polyclinidæ: *Aplidium* (including *Amaroucium*) and *Polyclinum*.

Section 3. Reticulatæ.

Tribe 1. Didemnidæ: *Didemnum*, *Eucœlium*, and *Leptoclinum*.

Tribe 2. Diplosomidæ: *Pseudodidemnum* and *Astellium*.

He also discusses the development of the compound *Ascidia* observed at Roscoff: Arch. Z. expér. i. pp. 661–704. History of the knowledge of those animals: *id. ibid.* pp. 501–613.

C. W. Peach preserves compound Ascidians in Canada balsam, after drying them on cotton or linen rag and blotting-paper. Specimens so treated 25 years ago remained beautifully preserved. Q. J. Micr. Soc. (2) xii. p. 162.

Botryllus. A. Giard, *l. c.* pp. 619–631, describes the following species, all observed at Roscoff:—

a. From the zone of *Fucus vesiculosus* and *serratus*: *B. violaceus* (M.-E.), p. 621, pl. 29. figs. 9–12, and *B. calendula*, sp. n., p. 623, pl. 27. figs. 1 & 2.

b. Zone of *Zostera* and *Himanthalia lorea*: *B. schlosseri* (Sav.), with several varieties, p. 625, pl. 30. figs. 10–12; *smaragdus* (M.-E.), p. 626, pl. 29. figs. 2–6; *pruinosus*, sp. n., p. 627, pl. 27. figs. 6 & 7, and pl. 29. fig. 1.

c. Zone of *Laminaria*: *aurilineatus*, sp. n., p. 629, pl. 30. figs. 5–7; *morio*, sp. n., p. 629, pl. 30. figs. 8 & 9; *marionis*, sp. n., p. 630, pl. 30. figs. 8 & 9; and *rubigo*, sp. n., p. 631, pl. 30. figs. 3 & 4.

Botrylloides rotifer and *ruber* (M.-E.), and *prostratus*, *clavelina*, and *insignis*, spp. nn.: *id. ibid.* pp. 631–633, pl. 27. figs. 3 & 10, and pl. 28. fig. 5, Roscoff. Some particulars concerning the development of *B. ruber* observed at Arendal in Norway, by C. Kupffer, Arch. mikr. Anat. viii.

Polyclinidæ.

Aplidium zostericola, sp. n., Giard, Arch. Z. expér. i. p. 636, pl. 26. fig. 5, Roscoff.

A. (subg. *Amaurocium* [?*Amauræcium*]) *densum*, sp. n., *id. ibid.* p. 637, pl. 26. fig. 1, and pl. 28. fig. 6, Roscoff.

A. (subg. n. *Fragarium*) *elegans*, sp. n., *id. ibid.* p. 638, pl. 28. figs. 4 & 5, Roscoff.

A. (subg. n. *Circinalium*) *concrescens*, sp. n., *id. ibid.* p. 639, pl. 25. figs. 2–5, and pl. 23. fig. 3*b*, Roscoff.

A. (subg. n. *Morchellium*), type *A. argus* (M.-E.), *id. ibid.* p. 640.

Polyclinum (Sav.). Several subgenera characterized: *id. ibid.* p. 642. *P. sabulosum*, sp. n., *id. ibid.* p. 643, pl. 23. fig. 4, and pl. 26. fig. 2, Roscoff.

Didemnidæ.

Didemnum niveum, *cereum*, and *sargassicola*, spp. nn., *id. ibid.* pp. 648 & 649, pl. 28. figs. 1, 2 and β–ζ, pl. 22. figs. 1–15, Roscoff.

Eucœlium parasiticum, sp. n., *id. ibid.* p. 650, pl. 22. figs. 4–14, Roscoff.

Leptoclinum perforatum and *lucasi*, spp. nn., *id. ibid.* pp. 652 & 653, pl. 26. figs. 3 & 4, pl. 22. fig. 12, Roscoff.

Diplosomidæ.

Pseudodidemnum, g. n. No endostylal appendage; branchial opening six-toothed. *P. crystallinum*, sp. n., Giard, *l. c.* p. 656, Roscoff.

Astellium, g. n. No endostylal appendage; branchial opening without teeth. *A. spongiforme*, sp. n., *id. ibid.* p. 657, pl. 23. fig. 1, and pl. 26. figs. 6 & 7, Roscoff.

Pyrosomidæ.

P. Pavesi thus sums up the results of his researches into the circulation of *Pyrosoma giganteum*:—1. The circulation is of the alternating type, whether in adults, embryos, or nurse (cyathozoid). 2. In the adults it is lacunar and independent, in the embryos vascular and common to the young colony. 3. The heart of the evanescent nurse presides over the circulation of the compound embryos, which is carried on by means of a double cord, derived from the development of a canal; and the vascular circle is closed in the nurse and in the last of the embryos. 4. The heart of the nurse is replaced by the hearts of the embryos, coexisting with the former for a certain time, but independent of it. 5. The circulation in the embryos, produced by budding, takes place as in the compound embryos, but is dependent on the mother in place of the nurse. 6. A lacunar circulatory system commences at the time that the vascular system begins to atrophy. 7. The pulsations of the heart are of variable duration. Q. J. Micr. Soc. (2) xii. pp. 275 & 283, pl. 12.

Salpidæ.

Salpa herculea and *cymbiola*, spp. nn., Dall, Am. J. Conch. vii. pp. 158 & 159, North Pacific, near the Aleutian Islands. Length of the first 8 inches; only the solitary form of both known.

Appendiculariidæ.

H. Fol, in an anatomical description of the family generally, points out the formation of the branchial openings by a double invagination, outside of the skin and inside of the pharynx, these meeting and resulting in a perforation fringed with vibratory cilia. He describes the endostyle as a canal for the secretion of slime, which is divided by the currents within the pharynx into several threads, directing the nutritive particles contained in the water to the œsophagus. He also describes the heart and the lacunar course of the blood, the ganglia and nerves, the testicle and ovary, situated (with one exception) one near the other in the same individual. The latter evacuates its contents by bursting; and the animal dies soon afterwards. Mém. Soc. Phys. Genèv. xxi. pt. 2, pp. 445–498, with 11 plates.

The following species of *Appendicularia* and allied genera have been observed by H. Fol in the Straits of Messina, and described accurately:—

1. *Œcopleura* (Chamisso). Body short and thick; endostyle straight; tail 3–4½ times as long as the body; no hood (capuchon). *Œ. cophocerca* (Gegenbaur), *spissa*, *rufescens*, *dioica* (♂ & ♀), and *fusiformis*, spp. nn., *l. c.* pp. 17–29, pl. 1 and pl. 2. figs. 1–7, pl. 3. figs. 1–4, pl. 10. fig. 3, pl. 4. figs. 1–6, and pl. 3. figs. 5–8.

2. *Fritillaria* (Q. & G.). Body elongate; endostyle arcuate; tail only ¼ longer than the body; a hood, consisting of a fold of the epidermis. *F. furcata* (Vogt), *megachile*, *[h]aplostoma*, *formica*, and *urticans*, spp. nn.: *l. c.* pp. 29–37, pl. 5. figs. 1 & 2, pl. 6. figs. 1–5, pl. 5. figs. 3 & 4, pl. 10. figs. 1 & 2, pl. 6. fig. 6, and pl. 7. figs. 8 & 9.

Kowalewskaia[*-skia*], g. n. No heart, endostyle, or intestine; pharynx armed with 4 rows of solid teeth, covered with vibratory cilia. *K. tenuis*, sp. n., *id. l. c.* p. 37 *et seq.*, pl. 10. figs. 4–6, and pl. 11.

POLYZOA.

Infundibulata.

Prof. R. Hartmann's anatomical and microscopical researches into the organization of *Halodactylus diaphanus* tend to confirm in several points the views of Prof. Reichert on the organization of *Bryozoa* (see Zool. Rec. vii. p. 186). Arch. Anat. Phys. 1871, pp. 489–529, pls. 13 & 14.

Cyphonautes. Prof. Allman, who observed this organism in considerable abundance in the Moray Firth, was not, however, able to pursue its development far enough to throw new light on its ultimate destination, but doubts if the view proposed by A. Schneider, that it is the larva of a polyzoon (*Membranipora*), will be found correct. Rep. Brit. Ass. and Q. J. Micr. Soc. (2) xii. pp. 395–397.

H. Nitsche states, in opposition to E. Metschnikoff, that in *Cyphonautes* the intestine, like every other internal organ, is only provisional, perishing in the later development, and is not transformed directly into the intestine of the more mature animal. Z. wiss. Zool. xxii. pp. 471 & 472.

Prof. Smitt replies to Nitsche on the development of *Bryozoa*. Q. J. Micr. Soc. (2) xii. pp. 246–248, and Z. wiss. Zool. xxii. pp. 281 & 282.

Flustra abyssicola, sp. n., M. Sars, Remark. Forms &c. pp. 19–22, pl. 2. figs. 25–30, Lofoden Islands, 120–300 fathoms.

Flustramorpha [rectius *Flustri-*], g. n. Cells on both sides of the frond, as in *Flustra*, but much more calcareous, and covered with a calcareous coat, as in *Eschara*. The frond supported by cylindrical, and often inosculating, horny fibres, which margin the frond and traverse it in various directions. *Flustra marginata* (Krauss) and *Eschara flabellaris* (Busk). Gray, Ann. N. H. (4) x. pp. 167–169.

Lepralia variolosa (Johnst.) and sp. indet., F. Schmidt, Mém. Pétersb. xviii. p. 67, pl. 4. figs. 16 & 17, subfossil, at the mouth of the Jenisei.

Idmonea punctata (Busk), *id. ibid.* p. 67, pl. 4. fig. 18, same locality.

Cellepora pumicosa (L.), *id. ibid.* p. 68, pl. 4. fig. 19, same locality.

Hippocrepia.

E. Metschnikoff has observed that in *Alcyonella* the eggs formed originally within the parent animal find their way into a sort of bud at the side of its body, and are there developed into the well-known larva. He describes accurately the first development of it, with particular regard to the different germinal layers (Keimblätter) and the origin of the various tissues. Bull. Pétersb. xv. (1871), p. 507.

H. Nitsche confirms this observation, explaining how the larvæ can leave the living parent body, although it possesses no genital orifice, since the bud eventually opens in the same manner as the sheath of the tentacles. The parent polypid undergoes a retrogressive metamorphosis, and ends by becoming a "brown body," as in *Flustra* (*cf.* Zool. Rec. viii. pp. 177 & 178). Z. wiss. Zool. xxii. pp. 467–471.

Rhabdopleura (Allman, 1869) = *Halilophus* (M. Sars, Förh. Selsk. Chr. 1868, p. 112). Polyzoarium or zoœcium forming a thin cylindrical chitinous hyaline tube, containing a chitinous rigid cord; polypids *without endocyst*, attached only by a contractile fleshy cord to the polyzoarium, without distinct muscles for retracting or protruding. Tentacles placed on two *separate* branches, between the bases of which is a shield-shaped fleshy prominence, like the foot of a snail, and behind it the mouth. Intestine well developed; anal orifice near the base of the branches, upwards. *R. mirabilis* (M. Sars), Lofoden Islands, Norway, at a depth of 100–300 fathoms, with *Rhizocrinus*. Movement very slow. M. Sars considers it a very low (old) form of *Polyzoa*, retaining several affinities to the Hydroid *Cœlenterata*. Sars, Remarkable Forms, &c. pp. 1–18, pl. 1, and pl. 2. figs. 1–24.

CRUSTACEA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

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Targioni-Tozzetti, A. Di una specie nuova in un nuovo genere di Cirripedi Lepadidei, ospitante sulle penne ad-

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Physiology.

The zoosperms of several higher Crustacea, as the lobster, some *Paguri*, *Stenorhynchus longirostris*, and *Carcinus mænas*, and their development, are the subject of a paper by A. Sanders, M. Micr. J. 1869, pp. 267–276, pls. 11 & 12. They are not linear, and have no undulating motion, thus agreeing with those of the *Arachnida* and *Myriopoda*.

The faculty of accommodating the colour of the skin to the surrounding medium by contraction of the pigment-cells is said to exist in *Palæmon serratus*, and to be lost when the animal has been deprived of sight: G. Pouchet, C. R. lxxiv. p. 757, J. Zool. i. p. 361, and Rep. Brit. Assoc. 1872.

G. O. Sars states that in several genera of *Crustacea* there are two sorts of males, one nearly resembling, the other very different from, the females; the former is much more common and may be found all the year round, the other only in one season; the latter may be the fully developed and the former the incomplete stage of the male. This has been observed in *Diastylis*, *Pontoporia*, *Apseudes*, and *Philomedes*, and exists therefore in very different orders. Beskriv. Freg. Joseph. Cumaceer, pp. 23 & 24.

Lloyd recommends the preservation of *Crustacea* by keeping them in glycerine and then drying them. C. Spence Bate, 4th Rep. on the Fauna of South Devon, Q. J. Micr. Soc. (2) xii. p. 402.

Contributions to Faunas.

Six species of *Cumacea* found at great depths (540–2000 fathoms) in the arctic sea are enumerated by G. O. Sars, Œfv. Ak. Förh. 1871, pp. 797–802.

A. Boeck, discussing the geographical distribution of the Amphipods in the Northern seas, states that the Arctic seas are

much the richest in individuals, but that the variety of forms becomes greater towards the south. One genus only, *Acanthostephia*, is exclusively proper to the Arctic Sea; but several are hitherto only known from Norway, and others only from the British coasts. Only one species is exclusively proper to Greenland, and five to Spitsbergen; all other Arctic species have been found also in Norway. Forh. Selsk. Chr. 1872, pp. 59–63.

Numerous marine Copepods from the coasts of Southern Norway are described: *Peltidium purpureum* (Phil.) has been found there. *Id. ibid.* pp. 35–60.

Several observations concerning the decrease in number of edible *Crustacea* are given by C. Spence Bate in his 4th Report on the Fauna of South Devon, Rep. Brit. Assoc. 1872, and Q. J. Micr. Soc. (2) xii. p. 402.

On the geographical distribution of the podophthalmous *Crustacea* in the Bay of Biscay, *cf.* P. Fischer, C. R. lxxiv. p. 1589.

The distribution of the British *Entomostraca* is the subject of a paper by G. S. Brady. He distinguishes between species that are truly littoral, inhabitants of estuaries, and of brackish or *subbrackish* waters (the last, though fresh, being subject in some degree to tidal influence) [*cf.* Zool. Rec. vii. p. 191]. Some species are more northern, and others confined to the south or south-western shores of the United Kingdom, and altogether absent from the eastern coasts. Lists are given of species found in the freshwater lakes of Mayo and Galway, the east shore of Ireland, the north coast of Scotland, South Wales and the Bristol Channel, Northumberland and Durham district, the Firth of Clyde, and Spitsbergen. A detailed table showing the distribution of all known species through the United Kingdom concludes the paper. Ann. N. H. (4) ix. pp. 48–70.

The marine non-parasitic *Copepoda* of the north-east coast of England are reviewed, and several new genera and species described. *Id. l. c.* x. pp. 1–16, pls. 2–6.

22 species of Decapods, 21 of Amphipods and Læmodipods, 7 of Isopods, 14 of Copepods and Siphonostomes, 8 of Cirripeds, and 3 of Pycnogonids, observed on the shores of North Germany, are enumerated by A. Metzger, JB. Ges. Hannov. xxi. pp. 27–32.

The terrestrial Isopods of Belgium have been enumerated by F. Plateau in Bull. Ac. Belg. (2) xxix. (1870), p. 112; *Philougria* [rectius *Philygria*] *riparia* (Kinahan) added: *id. ibid.* xxxiii. (1872) p. 426.

Bohemia. 12 species of parasitical *Copepoda*, 12 *Cyclopidæ*, 7 *Cypridæ*, 32 *Cladocera*, 5 *Phyllopoda*, 27 *Oniscidæ*, 2 *Gammaridæ*, and 1 *Astacus* have been observed in Bohemia and are described, most of them also illustrated with woodcuts, by A. Fric, Arch. Landesdurchf. Böhm. ii. pp. 203–269.

Black Sea. 9 species of *Brachyura*, 2 of *Anomura*, 7 of *Macrura*, 7 of *Stomapoda*, 38 of *Amphipoda* (including the Læmodipods), 17 of *Isopoda*, 7 of *Branchiopoda* (*Ostracoda*), and 20 of *Entomostraca* (Copepods and Siphonostomes) are enumerated as inhabitants of the Black Sea by B. Ulianin. Isvest. Obsh. Jest. Mosk. ix. pp. 68–79.

Pontoporia affinis (see Zool. Rec. viii. p. 181) and a few other *Crustacea*, the species of which are not yet determined, have been found in the depth of

Lake Ontario by H. A. Nicholson, Ann. N. H. (4) x. p. 285, and Rep. Brit. Assoc. 1872.

A few *Crustacea* found by dredging round the island of Anticosti, Gulf of St. Lawrence, are enumerated by J. F. Whiteaves, Ann. N. H. (4) x. p. 347.

Central America. 32 species of *Crustacea* collected by J. A. McNiel at the west coast of Central America, Nicaragua, the Bay of Fonseca, &c. are described by S. Smith, Rep. Peab. Ac. for 1869, published March 1871, pp. 87–98: some of them are from fresh water.

Cuba. 84 species of *Crustacea Decapoda* collected in Cuba by Dr. J. Gundlach and D. F. Poey, are reviewed by E. v. Martens (Arch. f. Nat. xxxviii. pp. 77–147, pls. 4 & 5), who determines the Cuban *Crustacea* mentioned by Parra in 1787, and gives other American localities from specimens in the Berlin Museum.

The Indian *Thelphusidæ* are reviewed by J. Wood-Mason, J. A. S. B. xl. pt. ii. (1871) pp. 189–200, pls. 11 & 12, pp. 201–207, pls. 13 & 14, and pp. 449–454, pl. 27: he enumerates and describes 2 species of *Parathelphusa* and 7 of *Thelphusa*; one of the former and two of the latter are from Cisgangetic India, one *Thelphusa* from Pulo Penang, the rest from Burma.

The list of *Brachyura* and *Anomura* collected by Prof. Giglioli during the voyage of the frigate 'Magenta,' determined by A. Targioni-Tozzetti, comprises 5 spp. of *Oxyrhyncha*, 21 of *Cyclometopa*, 20 of *Catometopa*, 8 of *Oxystoma*, and 9 of *Anomura* from the Indian Seas, China and Japan, Patagonia and Montevideo. Bull. Ent. Ital. iv.

DECAPODA.

BRACHYURA.

Oxyrhyncha.

Leptopodia debilis, sp. n., S. Smith, Rep. Peab. Ac. 1869 (1871), p. 88, Realejo, Central America.

Libinia distincta (Guérin) identified with Parra's "Cangrejo peludo," and described from Cuban specimens: Martens, Arch. f. Nat. xxxviii. p. 79.

Chorinus heros (Herbst): *id. l. c.* p. 80, pl. 4. fig. 2, Cuba.

Mithrax spinosissimus (Latr.), *aculeatus* (Herbst), *hispidus* (Herbst) and *sculptus* (M.-E.); on their differences, dimensions, and varieties, from Cuban specimens: *id. l. c.* pp. 81–83.

Othonia anisodon, sp. n., *id. l. c.* p. 83, pl. 4. fig. 3, Cuba.

Pericera trispinosa (Latr.), differences between males and females: *id. l. c.* p. 84, pl. 4. figs. 4 *a* & 4 *b*. *P. bicornuta* (Latr.), *id. ibid.* pl. 4. fig. 5, both from Cuba.

Parthenope horrida (L.); its existence in the West Indies denied, and the crustacean figured in Hughes's 'Nat. Hist. Barbadoes,' pl. 25. fig. 1, identified with *Mithrax spinosissimus*, *id. l. c.* p. 86.

CYCLOMETOPA.

CANCRIDÆ.

Carpilius corallinus (L.). Notes on coloration, Martens, Arch. f. Nat. xxxviii. p. 86.

Menippe ocellata (M.-E.) = "Cangrejo moro" of Parra, described from Cuban specimens, and *M. panope* (Herbst) = *granulosa* (Strahl), probably from Tranquebar, compared with it; *M. rumphii* (Herbst, *nec* M.-E.) = *belangeri* (M.-E.): *id. l. c.* pp. 87–89.

Ozius integer, sp. n., S. Smith, Rep. Peab. Ac. 1869 (1871), p. 89, Aspinwall, Central America.

Panopeus herbsti (M.-E.) described from Cuban specimens, and compared with some allied Caribbean species: Martens, *l. c.* pp. 89 & 90.

Pilumnus aculeatus (Say)? from a Cuban specimen: *id. l. c.* p. 91, pl. 4. fig. 6.

PORTUNIDÆ.

Lupa (*Neptunus*) *diacantha* (Say): some differences between specimens of different ages, and the presence of "sterile" females with the abdomen narrower than usual mentioned. *L. spinimana* (Lam.): remarks on specific characters. *L.* (*Achelous*) *rubra* (Lam.): the disposition of its lateral teeth compared with that of *Thalamita*, which differs only in the entire want of certain teeth which are smaller than usual in this species of *Lupa*. *L. forceps* (Fabr.): younger specimens have the hands less elongated, and are identified with *L. anceps* (Saussure). *Id. l. c.* pp. 93–96.

Arenæus bidens, sp. n., S. Smith, Rep. Peab. Ac. 1869 (1871), p. 90, Corinto, Nicaragua.

CATOMETOPA.

THELPHUSIDÆ.

Thelphusa indica (Latr.) = *cunicularia* (Westwood), *T. lugubris*, sp. n., Sikkim, Nepal, Khasi hills, and *T. stoliczkana*, sp. n., Pulo Penang, Wood-Mason, J. A. S. B. xl. pp. 196–200, pl. 12. figs. 5–7 and 8–12.—*T. lævis* and *austeniana*, Cherra Punji, *pealiana*, Sibsangor, Assam, and *atkinsoniana*, Darjeeling, Nepal, and Khasi hills, spp. nn., *id. ibid.* pp. 201–207, pls. 12 & 13.—*T. edwardsi*, *andersoniana*, *hispida*, and *tumida*, spp. nn., *id. ibid.* pp. 449–454, pl. 27. figs. 11–15, 16–20, pl. 28. figs. 1–5 & 6–10, Ponsee in Upper Burma and Yunan.

Thelphusa madagascariensis, sp. n., A. Milne-Ewards, Ann. Sc. Nat. (5) xv. p. 1, Madagascar.

Hydrothelphusa, g. n. Carapace nearly square, epibranchial regions little developed, front nearly horizontal, very prominent: in other respects like *Thelphusa*. *H. agilis*, sp. n., *id. ibid.* p. 2, Madagascar.

Paratelphusa dayana, sp. n., Wood-Mason, *l. c.* p. 192, pl. 11, Mandele and Prome, Upper Burma; *P. spinigera*, sp. n., p. 197, pl. 12. figs. 1–4, tanks of Calcutta.

Epilobocera cubensis (Stimpson) described and figured by Martens, Arch. f. Nat. xxxviii. p. 97, pl. 4. fig. 7.

GECARCINIDÆ.

Gecarcinus ruricola (L.). Some notes on its colours and habits by Gundlach and v. Martens, Arch. f. Nat. xxxviii. pp. 99 & 100. *G. lateralis* (Freminville), possibly its young state. They live in woods, and are seldom eaten.

Cardisoma guanhumi (Latr.). Notes on its habits by Gundlach. It lives in mango-groves and is migratory. *C. quadratum* (Saussure) possibly its young state. Martens, *l. c.* pp. 100 & 101.

Uca una (Latr.). The sexual differences first noted by Gerstäcker (1856) confirmed: *id. l. c.* p. 102.

OCYPODIDÆ.

Ocypode arenaria (Say)? from Cuba: Martens, *l. c.* p. 103.

Gelasimus vocator (Herbst)=*palustris* (M.-E.); on its variability, *id. ibid.* p. 104.

PINNOTERIDÆ.

Pinnoteres ascidi[*i*]*cola*, sp. n., in the cavity of *Ascidia*[*-um*] *canina*[*-um*] and *A. intestinalis*[*-e*], coast of France: Hesse, Ann. Sc. Nat. (5) xv. pp. 30–35. *P. pectunculi*, sp. n., in *Pectunculus flammulatus*, coast of France: *id. ibid.* p. 36. *P. pisum* (L.), common in mussels in Saintonge, but never found in Brittany, although mussels are very common there: *id. ibid.* p. 36, footnote.

GRAPSIDÆ.

Grapsus (*Goniograpsus*) *cruentatus* (Latr.). Specimens from various localities in the Caribbean sea show no reliable difference: Martens, *l. c.* p. 105.

G. pictus (Latr.)=*maculatus* (M.-E., following Catesby, who is pre-Linnæan), described from Cuban specimens. *Cancer tenuicrustatus* (Herbst)=*rudis* (M.-E.). *Id. l. c.* pp. 106 & 107.

G. (*Leptograpsus*) *corrugatus*, sp. n., *id. l. c.* p. 107, pl. 4. fig. 8, Cuba.

G. (*L.*) *rugulosus* (M.-E.)=*dubius*, *miniatus*, and *gracilis* (Sauss., wrongly as *Metopograpsus*), described from Cuban specimens: *id. l. c.* pp. 108 & 109.

Sesarma ricordi (M.-E.) described from Cuban specimens: *id. l. c.* p. 110. *S.* (*Aratus*) *pisonis* (M.-E.) lives also in Cuba in mango-groves: *id. l. c.* p. 111.

Plagusia squamosa (Herbst). No difference between specimens from Cuba, Brazil, Madeira, and even the Red Sea: *id. l. c.* p. 112.

OXYSTOMA.

CALAPPIDÆ.

Hepatus princeps (Herbst) = *fasciatus* (Latr.) and *H. decorus* (Herbst) = *vanbenedeni* (Herklots), both from Cuba, and both with individual variations: Martens, *l. c.* pp. 112 & 113.

LEUCOSIIDÆ.

Ebalia (*Lithadia*) *cubensis* and *brasiliensis*, spp. nn., Martens, *l. c.* pp. 114 & 115, pl. 5. figs. 9 & 10, Cuba and Rio Janeiro.

ANOMURA.

PAGURIDÆ.

Pagurus (Clibanarius) cubensis (Sauss.), perhaps identical with *sclopetarius* (Hbst.) and *vittatus* (Bosc), described by Martens, *l. c.* pp. 117 & 118.

Pagurus insignis (Sauss.) and *P. granulatus* (Ol.) described from Cuban specimens, *id. l. c.* pp. 119 & 120; the genus *Petrochirus* (Stimps.), created for the latter, can scarcely be maintained.

Diogenes varians (Heller) = *Pagurus ponticus* (Kessler), in the Black Sea. Ulianin, Mat. Faun. Black Sea, p. 70.

PORCELLANIDÆ.

Porcellana armata (Gibbes) ? = *galathina* (Bosc) described from Cuban specimens by Martens, *l. c.* p. 121, pl. 5. fig. 11; *P. gundlachi*, sp. n., *id. l. c.* p. 122, pl. 5. fig. 12, Cuba.

MACRURA.

PALINURIDÆ.

Palinurus femoristriga, sp. n., Martens, *l. c.* pp. 125 & 126, Amboyna, described in comparison with *guttatus* (Latr.) from Cuba. *P. ornatus* (Oliv.), ? from Cuba, *id. l. c.* p. 128.

The somewhat claw-like articulation between the last and penultimate joints of the fifth pair of feet has been observed in the females of *P. guttatus*, *femoristriga*, *vulgaris*, *argus*, *penicillatus*, *dasypus*, *ornatus*, and *japonicus*; even the males of the last-named show traces of this formation: *id. l. c.* pp. 127 & 128.

SCYLLARIDÆ.

Scyllarus (Arctus) gundlachi, sp. n., *id. l. c.* p. 123, described comparatively with *S. arctus* (F.), pl. 5. fig. 13, Cuba.

Ibacus antarcticus (F.). No difference between a Cuban specimen and another from the Indian Ocean: *id. l. c.* p. 124.

THALASSINIDÆ.

Callianassa (Leach) is monographed by A. Milne-Edwards, N. Arch. Mus. vi. pp. 75–102, who describes *C. subterranea* (Mont.), Mediterranean and coast of Western Europe; *gigas* (Dana), Puget Sound, N.W. America; *californiensis* (Dana) = *occidentalis* (Stimps.), San Francisco; *longimana* (Stimps.), Puget Sound; *uncinata* (M.-E.), Chili; *chilensis* (Alph. M.-E.), Chili; *brachyophthalma*, sp. n., p. 85, Chiloe; *major* (Say), Florida; *pachydactyla*, sp. n., p. 86, pl. 2. fig. 1, Cape-Verd Islands; *petalura* (Stimps.), Japan; *turnerana* (White), Cameroons, W. Africa; *armata*, sp. n., p. 90, pl. 1, Feejee Islands; *brevicaudata*, sp. n., p. 91, pl. 2. fig. 2, Zanzibar; *longiventris*, sp. n., p. 92, Martinique; *mucronata* (Strahl), Philippine Islands; *tridentata* (Martens), Java; *bocourti*, sp. n., p. 96, Pacific. Three fossil species are also described.

Callianidea gundlachi, sp. n., Martens, Arch. f. Nat. xxxviii. p. 132, pl. 5.

fig. 13, Cuba: differs from the typical species by the lamellar shape of its natatorial feet and by its flat rostrum.

Gebia spinigera, sp. n., S. Smith, Rep. Peab. Ac. 1869 (1871), p. 92, Corinto in Nicaragua, and Gulf of Fonseca.

ASTACIDÆ.

Astacus fluviatilis. The process of spawning and the fecundation by spermatozoids of the eggs whilst adhering to the lower side of the abdomen of the female is described by S. CHANTRAN, C. R. lxxiv. pp. 201 & 202, and J. Zool. i. pp. 356–358, abstract in Ann. N. H. (4) x. pp. 173 & 174.

The habits, anatomy, moulting, and breeding of the common crayfish are described with many details by STEFFENBERG, Bidrag &c. pp. 19–27, 28, 35, 36, 59, & 60–72. Eels are said to be great destroyers of crayfish in Sweden, but there are several instances of streams in which both abound; soiling the water with sawdust is said to make the crayfish disappear (pp. 23–25 & 28); the function of the stomach-teeth in grinding the food is defended against Œsterlen (p. 36); the "lapilli cancrorum," or so-called "eyes," are considered to be formed by calcareous matter reabsorbed from the shell when preparing for the moult, and to constitute a provisional deposit until again consumed for the hardening of the new shell (pp. 48–56). Full-grown individuals moult once in the year, but younger ones several times (pp. 57 & 58). Copulation takes place in Sweden in October, and is continued sometimes until November; but the females breed only every other year, the eggs not maturing sooner; they hide themselves after fecundation, so that, during the winter, only males or sterile females are caught (pp. 63 & 64); incubation, or the time during which the eggs are fixed to the underside of the abdomen of the female, occupies in Sweden 7 or 8 months, in more southern countries less (p. 68); the newly hatched young differ only in size, the form of the tail-fin, and the want of generative organs, from full-grown individuals (pp. 70 & 71). They have a length of about 8½ millims., not including the claws, after the first moult 11 millims., after the second 13 millims., and after the third 15 millims. (p. 72).

Its geographical range extends in Norway only to the south-eastern districts, and in Sweden as far north as the provinces Wermland, Dalarne, Helsingland, and Gestrikland, 60°–62° N. lat.; it is wanting in the larger rivers and in the large lakes (as, for instance, Lake Wettern, and now also Lake Wenern), is very rare in the Mälar Lake, and has been found only once in the inlets of the Baltic on the Swedish coast. It is very probable that it is not indigenous to these countries, but has been introduced by man in the latter half of the sixteenth century, as it is not mentioned before 1566, and, by an order of King Johann III. in 1574, carp and crayfish were to be brought from Germany. *Id. l. c.* pp. 5–17, 25.

Cambarus cubensis (Erichson) described by E. v. Martens, Arch. f. Nat. xxxviii. p. 129 & 130. *C. consobrinus* (Saussure) seems to be the same species.

Atyidæ.

Atya scabra (Leach) and *occidentalis* (Stimps.) from Cuba: *id. l. c.* p. 135.

Atya rivalis and *tenella*, spp. nn., S. Smith, Rep. Peab. Ac. 1869 (1871), p. 94, Polvon, Nicaragua, in freshwater streams.

Evatya, g. n. Body stout; rostrum prominent, carinate, armed above with stout spines; a spine on each side above the eye and 3 spines on the anterior border at the base of the antennæ. Thoracic legs of the 3rd pair very stout and tuberculate, their bases completely anchylosed with the coxa; ischium firmly united to the merus; dactylus short, unguiform, scarcely movable in its articulation. *E. crassa*, sp. n., *id. l. c.* pp. 95 & 96, Polvon, in freshwater streams.

Palæmonidæ.

Hippolyte liljeborgi (Danielssen, N. Mag. Naturv. 1857)=*securifrons* (Norman, 1863); *H. koreni* (Danielssen, *l. c.*)=*cranchi* (Leach): Danielssen, Förh. Selsk. Chr. 1872 (sep. print), pp. 9–11, figs. 5, 15–20, and 21–25, Lofoden and Vadsö, Norway, 40 and 60 fathoms.

H. cubensis, sp. n., Martens, Arch. f. Nat. xxxviii. p. 136, pl. 5. fig. 14, Cuba.

Palæmon squilla (L.)=*elegans* (Rathke) and *P. rectirostris* (Zaddach)=*adspersus* (Rathke), both in the Black Sea: Ulianin, Mat. Faun. p. 70.

Leander gracilis, sp. n., S. Smith, *l. c.* p. 97, Estero, at Realejo, Nicaragua.

P. tenellus, sp. n., *id. l. c.* p. 98, Polvon, Nicaragua.

P. jamaicensis (Herbst), *faustinus* and *mexicanus* (Saussure), all from Cuba, found in fresh water by Gundlach: Martens, *l. c.* pp. 137 & 138.

Xiphocaris, g. n. Rostrum longer than the rest of the cephalothorax, feeble, bent upwards, nearly entire at the upper, dentate at the under edge; mandible without palpus; lamella of the outer antennæ as usual; no spines on the abdominal segments; second pair of feet not annulated, third not cheliform. Type *Hippolyte elongata* (Guérin)=[*H*]*oplophorus americanus* (Saussure), from Cuba, *id. l. c.* pp. 139 & 140.

Peneidæ.

Peneus brasiliensis (Latr.) and *setifer* (L.), from Cuba, described: Martens, *l. c.* pp. 140 & 141.

Sicyonia carinata (Oliv.), from Cuba; *S. cristata* (Saussure) scarcely differs from it: *id. l. c.* p. 142.

Stenopus hispidus (Oliv.), from Cuba, differs only in colour and size from Indian specimens, and *S. semilævis*, sp. n., Cuba: *id. l. c.* pp. 143 & 144.

Synkimantites (Danielssen, 1863). 2nd pair of maxillipeds provided with a hairy palpus and large gill; 3rd pair 7-jointed, with 3 small gills. Front edge of cephalothorax with a strong antennary spine. Appendage of 1st pair of natatorial feet in the male united with that of the opposite side. *S. typicus* (Danielssen, 1863) described and figured by Danielssen & Böck, Forh. Selsk. Chr. 1872 (sep. print, pp. 4–8, figs. 1–14, Molde Fjord, Norway

CUMACEA.

Diastylis (Say.) = *Cuma* (Kröyer) = *Alauna* (Goodsir). A full description of the genus is given, the known species shortly enumerated, and the sexual differences described [see p. 186] by G. O. Sars, Beskriv. Freg. Joseph. Cumaceer, pp. 2–24.

Diastylis sculpta, quadrispinosa, abbreviata, longipes, insignis, and *josephinæ*, spp. nn., G. O. Sars, Œfv. Ak. Förh. 1871, pp. 71–78, and Beskriv. Freg. Joseph. Cumaceer, pp. 24–38, pls. 1–15. figs. 1–49, 50–61, 62–64, 65–67, 68–71, and 72–74, all from the North Atlantic, at 38–39° N. lat.; the 4th and 5th from 550 fathoms, the last from 750 fathoms.

D. polaris and *stygia*, spp. nn., *id.* Œfv. Ak. Förh. 1871, pp. 797 & 798, Arctic Sea, 80° and 78° N. lat., 950 and 2600 fathoms.

D. antillensis, sp. n., *id. l. c.* p. 803, Anguilla I., W. Indies.

Leucon (Kröyer) *longirostris*, sp. n., *id. l. c.* p. 78, and Beskriv. &c. p. 42, pl. 15. fig. 75, Atlantic, 38° N. lat., 550 fathoms. *L. anomalus*, sp. n., *id.* Œfv. Ak. Förh. 1871, p. 805, St. Martin I., West Indies. All known species enumerated; *id.* Beskriv. &c. pp. 38–42.

Eudorella (Norman) = *Eudora* (Sp. Bate); description of the genus and list of known species, *id.* Beskriv. &c. pp. 43–46. *E. pusilla*, sp. n., Shinnecock Bay, N. America, *hispida*, sp. n., Atlantic, 39° N. lat., and *deformis* (Kröyer, as *Leucon*), *id. ibid.* pp. 46–51, pls. 16–20. figs. 76–94, 95–97, and 101–118; the two former also in Œfv. Ak. Förh. 1871, pp. 79 & 80. *E. gracilis*, sp. n., *id.* Œfv. Ak. Förh. 1871, p. 800, Spitsbergen, 540 fathoms.

Campylaspis pulchella, sp. n., *id. l. c.* p. 806, Anguilla I., 200–300 fathoms.

Stephanomma, g. n. Known only from the female. Body elongate, no rostrum in front of the dorsal shield, and no bifurcate suture in its anterior part. Eye very large, composed of several ocelli disposed like a crown. 5 distinct segments in the fore part of the body. Only the first pair of feet palpigerous. No median caudal appendage. *S. goesi*, sp. n., *id. l. c.* pp. 808–810, St. Martin I., W. Indies.

STOMAPODA.

Mysidæ.

G. O. Sars has continued his monograph of the Norwegian *Mysidæ* (see Zool. Rec. viii. p. 187), the second part of it containing full descriptions and figures of the following genera and species :—

Amblyops (G. O. Sars) *abbreviata* (M. Sars), pp. 3–11, pl. 6, in deep water, 150–300 fathoms, along the whole coast of Norway.

Mysidopsis (G. O. Sars) *didelphys* (Norman), pp. 12–23, pl. 7, Gt. Britain and Norway, 30–150 fathoms, on bare clay bottom. *M. gibbosa* (G. O. Sars), pp. 23–27, pl. 8. figs. 1–13, only 6–7 millims. long, Middle and Southern Norway, 3–8 fathoms, on sandy bottom. *M. angusta* (G. O. Sars), p. 27, pl. 8. figs. 14–24, found with the preceding, coloration above pale, below dark violet.

Leucifer, sp. n. (not named) from the Philippines: notes on anatomy and sexual differences, by C. Semper, Z. wiss. Zool. xxii. pp. 305–307, pl. 22.

Nebaliidæ.

Nebalia. Prof. C. Claus's researches on *N. geoffroyi* (M.-E.) confirm Metschnikoff's view that this genus belongs to the *Malacostraca*, near the *Mysidæ*; the more striking differences from the rest of the *Malacostraca* are, however, the abdominal segments being 8 instead of 6, and the double telson; the thoracic feet are only apparently similar to those of the Phyllopods, on account of their lamellar shape; but really all their parts can be reduced to those of the *Mysidæ*. The male is similar to the female in size and general shape; but the flagellum of the lower antennæ is much longer (nearly as long as the body, composed of 80 joints), and the terminal bristles of the thoracic feet, which serve for ventilation in the cavity of the shell to the female, are much smaller, nearly rudimentary. Z. wiss. Zool. xxii. pp. 323–330, pl. 25.

Squillidæ.

Squilla rubrolineata (Dana)? = *dubia* (M.-E.), described from Cuban specimens by Martens, Arch. f. Nat. xxxviii. p. 144 & 145; *S. stylifera* (Lam.), from Cuba, identical with specimens from the East Indies, *id. ibid.* p. 146.

Gonodactylus chiragra (L.); Cuban and Indian specimens not positively distinct: *id. ibid.* p. 147.

AMPHIPODA.

A. Boeck has commenced a monograph of the Northern and Arctic Amphipods, the first part whereof contains introductory remarks upon morphology, chiefly concerning the epistome, feelers, upper lip, mandibles, first maxillæ, under lip, second maxillæ, maxillipeds, trunk of the body, postabdomen, and respiratory and ovigerous plates in the *Caprellidæ*, both of which plates are fixed on the 7th joint of the feet; but the former is always wanting to the first, the latter to the first and second pair of feet, pp. 3–13. Then follows an alphabetical list of the literature of the Amphipods down to the year 1870, containing 273 titles of books or published papers, pp. 14–31, a chronological record of the more important of them, beginning with the sea-flea mentioned by Aristotle, pp. 32–58, and an account of their geographical distribution (see above), pp. 59–63. In the special part, the same classification is adopted as in a previous paper by the same author (see Zool. Rec. viii. p. 187), only changing the names of the two chief divisions from *Hyperidæ* and *Gammaridæ* into *Hyperina* and *Gammarina*. The present part reaches as far as *Anonyx*.

Prostomatæ.

Trischizostoma raschi (Esmark), Böck, Amphipod. p. 97, pl. 2. fig. 1, Norway.

Orchestiidæ.

Orchestia gammarellus (Pallas, 1772) = *littorea* (Montagu) = *cuchore* (F. Müll.) = *tripudians* (Kröyer), Böck, *l. c.* p. 102, all European seas.

Talitrus locusta (Pallas) = *saltator* (Mont.), *id. l. c.* p. 105.

Hyale (Rathke, 1837) = *Allorchestes* (Dana, 1849) = *Nicea* (Nicolet) = *Galanthis* (Sp. Bate); *H. nilssoni* (Rathke) = *danai* and *lubbockiana* (Sp. Bate), *id. l. c.* pp. 107 & 109, pl. 3. fig. 3, Norway, England.

Gammaridæ.

Lysianassa plumosa (Böck, 1870) and *costæ* (M.-E.), Böck, *l. c.* pp. 116 & 118, pl. 3. fig. 5, and pl. 4. fig. 1, Norway, the latter also British, and from the Mediterranean.

Ambasia danielsseni (Böck, 1870), *id. l. c.* p. 121, pl. 3. fig. 6, Norway, 40–100 fathoms.

Ichnopus spinicornis (Böck, 1860) = *calceolatus* (Heller), and *I. minutus* (Böck, 1870), *id. l. c.* pp. 124 & 126, pl. 2. fig. 3, and pl. 3. fig. 7, Norway.

Socarnes vahli (Kröyer) = *nugax* (Owen, 1834, *nec* Phipps), *id. l. c.* p. 129, pl. 6. fig. 8, Greenland, Spitzbergen, and northern part of Norway.

Callisoma (Costa, 1851) = *Scopelochirus* (Sp. Bate, 1855) *crenata* (Sp. Bate), *id. l. c.* p. 132, pl. 7. fig. 1, Norway, England.

Hippomedon holbœlli (Kröyer), *id. l. c.* p. 136, pl. 5. fig. 6, and pl. 6. fig. 7, Norway and England, 40–150 fathoms.—*H. abyssi* (Goës), *id. l. c.* p. 138, Greenland, 250–300 fathoms.

Cyphocaris anonyx (Lütken), *id. l. c.* p. 141, pl. 6. fig. 1, Greenland.

Eurytenes gryllus (Mandt, 1822) = *Lysianassa magellanica* (M.-E.), *id. l. c.* p. 144, Arctic seas to Finmark.

Aristias tumidus (Kröyer) = *Lysianassa audouiniana* (Sp. Bate), *id. l. c.* p. 148, pl. 3. fig. 4, Greenland, Spitsbergen, Norway, 40–150 fathoms; also Adriatic Sea.

Anonyx lagena (Reinhardt) = *appendiculosa* and *ampulla* (Kröyer), *id. l. c.* p. 152, circumpolar, Norway, 20–100 fathoms; *lilljeborgi* (Böck, 1870), *id. l. c.* p. 154, pl. 4. fig. 3, Norway, 40–200 fathoms; *gulosus* (Kröyer) = *norvegicus* (Lillj.) = *holbœlli* (Sp. Bate), *id. l. c.* p. 157, pl. 5. fig. 4, Arctic and Northern seas, Adriatic; *pumilus* (Lillj.), *id. l. c.* p. 159, pl. 5. fig. 5, and pl. 6. fig. 6.

The descriptions of some other Amphipods figured on the plates are not contained in the first part of Böck's work.

Atylus falcatus, sp. n., Metzger, JB. Ges. Hannov. xxi. p. 28, North Sea, near Heligoland.

Corophiidæ.

Siphonœcetes cuspidatus, sp. n., A. Metzger, *l. c.*, p. 30, Juistisland, on the shore of Eastern Friesland.

Hyperiidæ.

Hyperia medusarum (Müll.) = *galba* (Montagu) = *latreillii* and *cyanea* (M.-E.) = *oblivia* (Kröyer) = *Lestrigonus exulans* (Kröyer): Böck, *l. c.* p. 79, pl. 1. fig. 1, North and Arctic Seas.—*H. spinipes* (Böck), *id. l. c.* p. 81, pl. 2. fig. 2, Norway, on *Cyanea capillata*.

Tauria (Dana, 1853) = *Metœcus* (Kröyer, 1838, preoccupied in *Insecta*). *T. medusarum* (O. Fabr.), Böck, *l. c.* p. 82, Greenland and Spitsbergen.—*T. abyssorum* (Böck), *id. l. c.* p. 83, pl. 1. fig. 2, Hardangerfjord, Norway, 200–300 fathoms.

Parathemisto abyssorum (Böck, 1870), *id. l. c.* p. 85, pl. 3. fig. 1, Norway, 200–300 fathoms.

Themisto bispinosa (Böck, 1870), *id. l. c.* p. 87, pl. 1. fig. 4, Greenland; *T. libellula* (Mandt) = *arctica* and *crassicornis* (Kröyer), *id. l. c.* p. 88, pl. 1. fig. 5, Spitsbergen.

Tryphanidæ.

Tryphana malmi (Böck, 1870), Böck, *l. c.* p. 92, pl. 1. fig. 3, Hardangerfjord, Norway, 100 fathoms.

Phronimidæ.

Phronima sedentaria (Försk.). The male is distinguished by a longer and more stout abdomen and stronger abdominal feet; the shape of the prehensile hand varies according to age. *P. atlantica* (Guérin) is only a younger female of the same species, which occurs in all warmer seas of both hemispheres. The little gelatinous barrel in which the female dwells is proved to be the remains of *Pyrosoma*. C. Claus, Z. wiss. Zool. xxii. pp. 331–338, pls. 26 & 27.

Cyamidæ.

This "group" has been reviewed by Alex. Brandt in Bull. Pétersb. xviii. pp. 113–132 (Mél. Biol. viii. pp. 673–702); he admits only one genus and the following species:—

1. *Cyamus kessleri*, sp. n., described and figured (woodcuts), pp. 676–688, from a whale in Behring Straits; 2. *ovalis* (Rouss.), to which may belong also the individuals described by the author in Mém. Pétersb. xvii. p. 26, from *Balæna japonica*? and those designated as *C. rhytinæ*?, *ibid.* p. 20, from Kamtschatka; 3. *ceti* (L., auctt.) = *mysticeti* (Lütk.), from the "right whale;" 4. *monodontis* (Lütk.), from Greenland; 5. *erraticus* (Rouss.), some specimens without known locality; 6. *boopis* (Lütk.), from *Megaptera boops*, Greenland; 7. *globicipitis* (Lütk.) = ? *delphini* (Guérin, Iconogr.); 8. *nodosus* (Lütk.), from the narwhal, Greenland, and *Delphinus globiceps*, Færoes; 9. *gracilis* (Rouss.); 10. *thomsoni* (Gosse, Ann. N. H. 1855), forming the genus *Platycyamus* of Lütken. The last two species have some resemblance to immature specimens of the others, but nevertheless are distinct; the first and second are the most differentiated. Generally the females are of smaller size, but relatively, or even absolutely, broader than the males; in the younger state the segments are more equal, and the shape of the body is more elongate; there are no eyes visible when very young.

Some preliminary notes on the same subject also made at the third meeting of Russian naturalists at Kiew; Z. wiss. Zool. xxii. p. 200.

Cyamus scammoni, on the Californian grey whale, *Rhachianectes glaucus* (Cope) and *suffusus*, on the "Hump-back," *Megaptera versabilis* (Cope), California; and *C. mysticeti*, on the northern "Bow-head," probably *Balæna*

mysticetus (L.), Behring Strait: spp. nn. Dall, P. Cal. Ac. Nov. 9, 1872; the second again mentioned, *ibid.* December.

ISOPODA.

Oniscidæ.

W. Ainslie Hollis has observed in *Porcellio scaber* and *Oniscus asellus* that the newly formed tooth of the mandible forces its way along the hollow limb of the old mandible, and that the maxillæ, with their palpi, have a similar mode of growth. J. Anat. Phys. (2) x. p. 398, pl. 18.

Porcellio domesticus, sp. n., Fric, Arch. Landesdurchf. Böhm. ii. p. 262, woodcut. Podebrad, Bohemia.

Ægidæ.

Slabberina agilis (G. O. Sars), shortly described by A. Metzger, JB. Ges. Hannov. xx. p. 32, islands on the shore of East Friesland.

Cymothoidæ.

Cymothoa punctata, sp. n., Ulianin, Mat. Faun. Black Sea, p. 74, Black Sea, on *Clupea pontica* (Eichw.).

PHYLLOPODA.

Branchipus. W. J. Schmankiewitsch has observed, near Odessa, that *B. arietinus* is larger and paler in slightly salt water, but smaller and redder in strong salt water. By continued breeding he found that new generations can live in waters of very different degrees of saltness (from 3° to 18° of Bomé's scale), in which the parents could not live, and that they then exhibited remarkable differences in structure, such as the development of caudal lobes, the want or increased number of caudal spines, and even the increased number of abdominal segments, so that generations raised in water of a less degree of saltness in a remarkable degree resembled other distinct species which live in fresh water. Striking variations have also been observed in the sexual organs—females with stout horn-shaped lower antennæ, like those of the males, and males with deformed sexual organs; such individuals are also found in ponds of which the saltness has been diminished by copious rains. He has also observed parthenogenetic reproduction in the genus, which takes place in every case of unusually increased or diminished saltness, producing only females; only at a middle degree of saltness are males sometimes to be found. Trans. 3rd meeting of Russ. nats. at Kiew, and Z. wiss. Zool. xxii. pp. 293–295.

C. Vogt confirms Siebold's statement that males of *Branchipus diaphanus* and *Artemia salina* are extremely rare (*cf.* Zool. Rec. viii. p. 179). Arch. Sci. Nat. 1872, p. 30; abstr. Ann. N. H. (4) x. pp. 405 & 406.

Branchipus grubi (Dybowski, 1860?); Fric, Arch. Landesdurchf. Böhm. ii. p. 233, woodcut, Bohemia.

Limnadia stanleyana (King, 1855), from Australia, fully described by Claus; of 9 specimens 6 were *males*; the presence of an epithelial layer on the shell is stated; the lower part of the head is more elongated in the male, a sexual difference also found in *Estheria*; the first two pairs of feet are in the male transformed to prehensile organs, with a terminal hook, having an adhesive disk at its tip; the ninth and tenth pair in the female have long filiform appendages. Z. wiss. Zool. xxii. pp. 355–364, pls. 29 & 30.

CLADOCERA.

Lynceidæ.

Lynceus lacustris, new name for *L. macrurus* (Leydig & Lievin, *nec* Fischer): Fric, *l. c.* p. 242, woodcut; from mountain-lakes in Bohemia.

OSTRACODA.

Cypridid æ.

Cypris ? cambrica, sp. n., Brady, Ann. N. H. (4) ix. p. 55, pl. 1. figs. 3 & 4, off Pennarth Head, Bristol Channel.

Candona similis, sp. n., *id. l. c.* p. 51, pl. 1. figs. 1 & 2, east of Ireland.

Metacypris cordata (B. & R.), *id. l. c.* p. 50, pl. 2. figs. 9 & 10, Lough Aubwee, near Galway.

Pontocypris mytiloides and *hispida* (G. O. Sars), distinguished: *id. l. c.* p. 61.

Cytheridæ.

Cytherura quadrata (Norm.), Brady, *l. c.* p. 56, pl. 1. figs. 10 & 11, S. Wales.

Cytherideis subulata (Brady), *id. l. c.* p. 59, pl. 1. figs. 12 & 13, and pl. 2. figs. 11–13, Firth of Clyde.

Cytheropteron inornatum and *angulatum*, spp. nn., *id. l. c.* pp. 61 & 62, pl. 2. figs. 1–3 & 7, 8, Firth of Clyde.

Paradoxostoma orcadense, sp. n., *id. l. c.* p. 53, pl. 1. figs. 5–7, Stromness Bay, Orkney; *P. flexuosum* figured, *id. l. c.* figs. 8 & 9.

COPEPODA.

Calanidæ.

Pseudocalanus, new name for *Clausia* (Böck, 1864, *nec* Claparède, 1863); *P. armatus*, sp. n., Böck, Forh. Selsk. Chr. 1872, pp. 37 & 38, Haugesund, Norway, 30 fathoms.

Candace elongata and *armata*, spp. nn., *id. l. c.* p. 39, Norway.

Euchæta armata and *norvegica*, spp. nn., *id. l. c.* pp. 39 & 40, Skudesnæs, Norway, 300 fathoms.

Heterochæta norvegica, sp. n., *id. l. c.* p. 40, Norway.

Isias clavipes (Böck) described by G. Brady, Ann. N. H. (4) x. p. 3.

Cyclopidæ.

H. Vernet describes the male and female organs and their accessory glands, copulation (one fecundation of the female suffices for several breedings), and circulation in *Cyclops*. As

there is no heart, the circulation is caused by movements of the stomach, the intestine, and a membrane traversing the whole cephalothorax like a diaphragm, thus: the swelling of the stomach drives a part of the blood forwards into the various organs of the body; and this is replaced during the contraction of the stomach by a quantity of blood driven forwards by a feeble dilatation of the intestine, and drawn in by the contraction of the stomach; the contraction of the intestine then draws the blood from the lacunæ in the feet and thoracic muscles; thus the anterior part of the cavity of the body acts like a ventricle, and the posterior as an atrium of the heart. Observat. anatom. et physiolog. sur le genre Cyclops. Genève: 1871, pp. 1–40.

The same author (*l. c.* pp. 41–44) discusses the species of *Cyclops* observed near Geneva, and which prove to be smaller than in Germany.

Cyclops longicornis, sp. n., *id. l. c.* p. 44, pl. 1. fig. 3, environs of Geneva; *C. brevicornis* (Claus), *id. ibid.* fig. 1; first abdominal segment of *serrulatus* (Fischer) and *bicuspidatus* (Claus), *id. ibid.* figs. 2 & 4.

C. pauper, sp. n., Fric, Arch. Landesdurchf. Böhm. ii. p. 223, woodcut, Podebrad, Bohemia.

C. littoralis, sp. n., Brady, Ann. N. H. (4) x. p. 5, pl. 2. figs. 9–14, tidal pools near Whitley and Ryhope; *C. ovalis*, sp. n., *id. l. c.* p. 5, pl. 3. figs. 1 & 2, off Sunderland.

C. christianensis, sp. n., Böck, Forh. Selsk. Chr. 1872, p. 43, Christianiafjord, also in salt water.

Cyclopina longicornis, sp. n., *id. l. c.* p. 41, Norway.

Hemicyclops, g. n. Jaws with a strong, unarticulated palpus, bearing on its tip many feather-like bristles; first pair of maxillipeds 2-jointed, second 4-jointed, both strong. Branches of the four anterior feet 3-jointed; last pair of feet 2-jointed, blade-like. *H. purpureus*, sp. n., *id. l. c.* p. 42, Norway.

Bæckia, g. n. [*Crustacea*; Malm, 1870]. Like *Cyclops*; upper antennæ very short, 6-jointed; swimming-feet short and broad. Mouth-organs totally different from those of any of the allied genera (but not described). *B. arenicola*, sp. n., Brady, Ann. N. H. (4) x. p. 6, Seaton Carew, N.E. England.

Pseudocyclops, g. n. Right upper antenna of male without a hinge-joint, but much swollen in the middle; lower antennæ 2-jointed. First pair of feet of male very complex in structure, the internal branch of one side produced into a powerful sickle-shaped clasping-joint, the whole resembling very closely the male copulative organ of some *Ostracoda*. *P. crassicornis*, sp. n., *id. l. c.* p. 7, pl. 2. figs. 1–8, off Seaham harbour, N.E. England.

Cyclopicera, g. n. Upper antennæ many-jointed, bearing a sword-shaped appendage near the distal extremity, resembling that of the *Harpactidæ*. *C. lata*, sp. n., *id. l. c.* pp. 8 & 9, pl. 3. figs. 3–8, Roker, England, in rock-pools.

Harpactidæ.

This family is divided into 5 subfamilies, including the *Peltidiidæ* of Claus, by Böck, Forh. Selskr. Chr. 1872, pp. 43, 44, 58, & 59, as follows:—

a. *Longipedinæ*: second pair of maxillipeds foot-like, not prehensile. *Ectinosoma, Zosime, Bradya.*

b. *Tachidinæ*: second pair of maxillipeds prehensile, as in the following; first pair of feet natatory, as the rest of the feet.

c. *Harpactinæ*: second pair of maxillipeds and first pair of feet more or less prehensile. *Amymone*, *Stenhelia*, *Ameira*, *Mesochra*, *Laophonte* (Phil., 1840) = *Cleta* (Claus, 1863), *Cletodes*, &c.

d. *Peltidiinæ*: second pair of maxillipeds subprehensile; palpus of mandibles peculiarly formed. *Peltidium* (Phil.) = *Oniscidium* (Claus).

e. *Metinæ*: upper antennæ with an articulated accessory branch, lower antennæ prehensile; mandibles and their palpi elongate, other oral parts rudimentary; fifth pair of feet wanting. *Metis* (Phil.).

Canthocamptus imus, sp. n., Brady, Ann. N. H. (4) x. p. 11, pl. 4. figs. 1–5, off Seaham harbour.

Ectinosoma sarsi and *curticornis*, spp. nn., Böck, *l. c.* pp. 45 & 46, Christianiafjord.

Zosime, g. n. Upper antennæ short, 6-jointed; inner branch of lower antennæ elongate; palpus of mandibles large, 2-jointed. First pair of maxillipeds with 3 wart-like prominences on the inner side, bearing feather-shaped bristles. *Z. typica*, sp. n., *id. l. c.* p. 46, Christianiafjord, 16 fathoms.

Bradya, g. n. Upper antennæ very short, 7-jointed; inner branch of lower antennæ elongate; palpus of mandibles well developed, with two large one-jointed branches. First pair of maxillipeds as in the preceding. *B. typica*, sp. n., *id. l. c.* p. 47, Christianiafjord, 16 fathoms.

Amymone rubra, sp. n., *id. l. c.* p. 48, Norway.

Stenhelia longicaudata, sp. n., *id. l. c.* p. 49, Norway.

Ameira parva, sp. n., *id. l. c.* p. 49, Norway.

Mesochra minuta, sp. n., *id. l. c.* p. 50, Norway.

Laophonte hodgii, sp. n., Brady, *l. c.* p. 12, pl. 6. figs. 1–9, off Seaham harbour.

L. elongata, *koreni*, *nordlandica*, *affinis*, and *minuta*, spp. nn., Böck, *l. c.* pp. 50–52, Norway.

Cletodes, g. n. Upper antennæ 6-jointed; lower antennæ without a secondary branch. All 4 pairs of swimming-feet equal. *C. limicola*, sp. n., Brady, *l. c.* p. 12, pl. 6. figs. 10–17, off Seaham harbour, *C. laticauda* and *buchholzi*, spp. nn., Böck, *l. c.* pp. 52 & 53, Haugesund, Norway.

Enhydrosoma, g. n. Accessory branch of lower antennæ 1-jointed; palpus of mandibles elongate, 3-jointed; second pair of maxillipeds more developed. In other respects like the preceding genus. *E. curticauda* and *longicaudata*, spp. nn., Böck, *l. c.* pp. 52–54, Christianiafjord.

Danielssenia, g. n. Inner branch of the first pair of feet 2-jointed, of the three following pairs 3-jointed; upper antennæ 4-jointed; accessory branch of lower antennæ 2-jointed; palpi of mandibles and maxillæ well developed. *D. typica*, sp. n., *id. l. c.* pp. 54 & 55, Haugesund, Norway.

Dactylopus normani, sp. n., Brady, *l. c.* p. 15, pl. 5. figs. 13–17, Roker, on *Laminaria saccharina*.

D. longipes, sp. n., Christianiafjord, 16 fathoms, and *abyssi*, sp. n., Haugesund, 80 fathoms, Böck, *l. c.* p. 56.

Diosaccus, g. n. Two ovisacs; upper antennæ 8-jointed, basal part long, 5-jointed; accessory branch of lower antennæ 2-jointed; palpus of mandibles with rudimentary outer branch. *Dactylopus tenuicornis* and *longirostris* (Claus), *D. abyssi*, sp. n., Norway, *id. l. c.* p. 57.

Metis ignia (Phil.) described, *id. l. c.* p. 60, Christiansund, Norway.

Corycæidæ.

Macrochiron [μακρόχειρ (with no neuter) = *longimanus*; *Macrochirus*, Schön. *Col.* 1838, Swains. *Pisces*, 1839, *-chires*, Nitzsch, *Aves*, and *-chira*, Zett. *Dipt.* 1840], g. n. Lower maxillipeds very long and powerful; first three pairs of swimming-feet equal. *M. fucicolum*, sp. n., Brady, *l. c.* p. 9, pl. 3. figs. 9–18, Ryhope and Sunderland, England, near low-water mark.

Notodelphidæ.

The Recorder has thought it advisable to give an abstract of the characters of the following 6 genera (the males of the species of which are all unknown), published by Hesse, Ann. Sc. Nat. (5) xv., and briefly noticed in Zool. Rec. viii. p. 194:—

Megasanoixus [potius *Megalanœxis*]: 1st thoracic segment obovate, as long as the 3 following together; 4th segment much narrower than the preceding, and the 1st abdominal forming a strong strangulation in the middle of the body; 2nd abdominal segment broader than thorax; four pairs of 2-branched feet, their terminal joint cheliform, very flat.

SIPHONOSTOMA.

Ergasilidæ.

Megalobrachinus: anterior feet very long; eyes situated on the underside of the carapace at the front of an oval protuberance with depressed centre.

Macrobrachinus: anterior feet very long, with a prehensile claw; eyes very small, on the forehead; first thoracic segment rhomboidal, the following gradually smaller; mouth in the middle of the underside of the first thoracic segment, at the base of a pear-shaped protuberance.

Metopocatacotinus: first thoracic segment oblong, very large, its front edge 4-notched; eye small, median; feelers with numerous feathered fine hairs; 3 pairs of strong natatorial feet.

Caligidæ.

Hæma[*to*]*philus*: first thoracic segment oval, very large; the 3 others forming a round disk; a pair of slender feet at the base of the first segment; the next pair of feet divided into 3 branches.

Metoponanaphrissontes [rectius *Metopanaphrisson*]: first joints of the feelers with bristly pectinated hairs and longer sharp stings; three thoracic segments gradually decreasing in size.

XIPHOSURA.

Packard's paper on the development of *Limulus polyphemus* was published fully in Mem. Bost. Soc. ii. pp. 155–202, pls. 3–5, issued March 1872. To the report in Zool. Rec. viii. pp. 195, 196, may be added that the palæontological evidence concerning the history of the various orders of *Crustacea* is duly pointed out, the author coming to the conclusion that the *Merostomata* (*Limulus*) are most nearly allied to the *Trilobitæ*, from which

they are chiefly distinguished by the want of distinct thoracic segments, and that these two orders are co-ordinate offshoots from a common stem. He replies to Dr. A. Dohrn's objections (Jen. Z. Nat. vi. p. 4) to the terminology and terms "chorion" and "larval skin," and gives a sketch of a deformed forked caudal spine of *Limulus*.

E. VAN BENEDEN thinks that the knowledge of the development of *Limulus* proves its nearer affinity to the *Arachnida* (especially to the *Scorpionidæ*) than to the *Crustacea*, and that with it the Trilobites should be removed from the latter to the former class. C. R. Ent. Belg. Oct. 1871, and J. Zool. i. 1872, pp. 41–44; an abstract also in Ann. N. H. (4) x. pp. 98 & 99.

Prof. OWEN identifies the caudal spine of *Limulus* with the abdomen of the other *Crustacea*, Nature, Jan. 17, 1872.

H. WOODWARD urges the affinity of *Limulus* to the Trilobites, stating, on Prof. Owen's authority, that it possesses two pairs of appendages, receiving their nerves from the supra-œsophageal ganglion. J. G. Soc. 1871, and Q. J. Micr. Soc. (2) xii. pp. 159 & 160; abstr. Ann. N. H. (4) ix. p. 406.

CIRRIPEDIA.

BALANIDÆ.

Balanus porcatus (Dac.), *crenatus* (Brug.), and *hameri* (Ascan.) subfossil at the mouth of the river Jenisei, F. Schmidt, Mém. Pétersb. xviii. 1, p. 68.

Coronula diadema (Lam.) ?, or, perhaps, a similar but distinct species from *Megaptera versabilis*, N.W. America: W. H. Dall, P. Cal. Ac., 1872 (p. 2).

Cryptolepas, g. n. Scuta and terga both present, minute; valves six, externally produced below the surface of the whale's skin into thin radiating laminæ, with their planes perpendicular to the vertical axis of the animal, and bifurcating and enlarged towards their distal edges. *C. rhachianectis*, sp. n., sessile on *Rhachianectes glaucus* (Cope), *id. ibid.*

LEPADIDÆ.

Ornitholepas, g. n. Stalk very short; valves absent or (in smaller specimens) four in number; carinæ 0–5; thorax in front with expanded and jointed edges, forming a tube; cirri very short; no penis; a semilunar labrum and two angularly bent mandibles. *O. australis*, sp. n., from feathers of the belly of *Prion finus cinereus*. The tube formed by the thorax may be an adaptation for retaining water for some time; and the shortness of the cirri may prevent them from drying too soon when the animal is lifted by the bird from the water. Targioni-Tozzetti, Bull. Ent. Ital. iv. (pp. 1–13) pl. 1.

Otion stimpsoni, sp. n., Dall, *l. c.* (p. 3), sessile on *Coronula* infesting *Megaptera versabilis*, but never on the surface of the whale itself.

Prosopistoma (Latr.) [see Zool. Rec. viii. p. 406,], formerly placed among the Crustaceans, and proved by E. Joly to be the larva of an insect, probably of the family *Ephemeridæ*, is provided with numerous tracheæ, but probably undergoes a metamorphosis in the larval state. Mém. Soc. Cherb. xvi. pp. 3–8, Ann. Sc. Nat. (5) xv., and C. R. lxxiv. p. 1413.

ARACHNIDA

BY

The Rev. O. P. Cambridge, M.A., C.M.Z.S.

THE GENERAL SUBJECT.

Cambridge, O. P. Hints on Collecting Arachnida. Nature, vii. (No. 166) pp. 163 & 164.

Koch, Carl. Beiträge zur Kenntniss der Arachniden der Canarischen Inseln. Ber. Senck. Ges., June 1871–June 1872, pp. 91–98.

Records and describes, from materials collected by Drs. Grenacher and Noll in Teneriffe, 4 known species of *Phalangidea* and 14 of *Araneidea*.

Koch, Ludwig. Apterologisches aus dem fränkischen Jura. Abh. Ges. Nürnb. vi. (1872), pp. 127–152, figs. 1–32.

Characterizes one new and one known genus, with 7 new and one known species, of *Araneidea*, and 2 new species of *Acaridea*.

Simon, Eugène. Notice sur les Arachnides cavernicoles et hypogés. Ann. Soc. Ent. Fr. (5) ii. pp. 215–244, pl. 12.

Comprises a new genus and some species of *Araneidea*, a new species of *Pseudoscorpionidea*, and several others of *Phalangidea*.

——. Arachnides de Syrie, rapportés par M. Charles Piochard de la Brûlerie. (Scorpions et Galéodes.) *Ibid.* pp. 247–264.

——. Notice complémentaire sur les Arachnides cavernicoles et hypogés. *Ibid.* pp. 473–488, pl. 16.

Describes a new genus and 6 new species of *Araneidea*; also one new and 3 known species of *Phalangidea*.

A. S. Packard, Jun., records a species of *Araneidea* and two of *Phalangidea* from the Mammoth Cave, Kentucky. Am. Nat. v. p. 47.

ARANEIDEA.

BERTKAU, PHILIPP. Ueber die Respirationsorgane der Araneen. Arch. f. Nat. xxxviii. (1872), Heft 2, pp. 208–233, pl. vii.

The author, after briefly indicating the various works in which the respiratory system of the *Araneæ* or true spiders is discussed (including Leuckart's suggestion that the so-called lungs of the *Araneidea* are only a special modification of the peculiar tracheal system of the class), describes at great length the anatomical structure of the "lungs" and tracheæ in various genera and groups, figuring the various portions of, or connected with, the "fan tracheæ" of *Zilla calophylla* (figs. 1 & 2), *Oletera picea* (fig. 3), and *Xysticus viaticus* (fig. 4), and of the tubular tracheæ of *Dysdera erythrina* (fig. 5), *Segestria bavarica* (fig. 6), *Dictyna benigna* (figs. 7 & 8), *Micryphantes rubripes* (fig. 9), *Dendryphantes muscosus* (fig. 10), *Thomisus calycinus* (fig. 11), *Melanophora subterranea* (fig. 12), *Zilla calophylla* (fig. 13).

He proposes the following classification, chiefly based on the respiratory organs (as here abstracted):—

Fam. *Scytodides*: 2 fan tracheæ in front, 4 simple tubular tracheæ at apex of abdomen; *Scytodes*. Fam. *Micryphantides*: 2 slightly developed fan tracheæ in front of abdomen; a wide gap before the spinning-nipples, leading to a well-developed tracheal system, consisting of a main trunk giving off cylindrical vessels; *Dictyna*, *Erigone*, *Micryphantes*. Fam. *Sparassides*: 2 foliate tracheæ in front of abdomen, at the apex 4 unbranched cylindrical tracheæ; *Thanatus*, *Sparassus* (*Micrommata*?). Adopting these families, the *Araneidea* may be thus grouped:—

2 pairs of fan tracheæ ..... *Mygalides.*
1 pair of fan tracheæ.
  1 pair of tufted tubular tracheæ,
    with separate stigmata ..... *Dysderides* and *Argyroneta.*
    with common aperture ..... *Micryphantides, Attides.*
  1 pair of arborescent branchiate tubular tracheæ, with common aperture. *Thomisides.*
  4 simple tubes, common aperture ..... *Scytodides, Drassides, Agelenides* (except *Argyroneta*), *Epeirides, Theridiides* (greater part), *Sparassides, Lycosides.*

CAMBRIDGE, O. P. General List of the Spiders of Palestine and Syria, with descriptions of numerous new species, and characters of two new genera. P. Z. S. 1872, pp. 212–354, pls. xiii.–xvi.

Records 278 species, of which 151 are described as new.

——. On British Spiders. A Supplement to a communication "On British Spiders new to Science" &c., read before the Linnean Society, January 20th, 1870. Tr. L. S. xxviii. pp. 433–458, pls. 33–35.

Records numerous species new to Britain, and 7 species new to science.

KEMPELEN, L. VON. Verh. z.-b. Wien, xxi. (1871) pp. 18–21.

Reviews Thorell's works on the European genera and synonyms of European Spiders.

KOCH, LUDWIG. Beitrag zur Kenntniss der Arachnidenfauna Tirols. Z. Ferd. 1872, pp. 239–328.

Describes 24 species of various genera of *Araneidea* as new.

——. Die Arachniden Australiens, nach der Natur beschrieben und abgebildet. Nürnberg: 1872, pts. 6 & 7, pp. 249–368, pls. xxi.–xxvii.

These two parts continue the work (see Zool. Rec. viii. p. 198), and include four new genera and 66 species of *Araneidea*, 40 of the latter being described as new.

MENGE, A. Preussische Spinnen. V. Abtheilung. Schr. Ges. Danz. pp. 297–326, pls. 54–57.

The present part includes the genera *Dysdera*, *Segestria*, *Gnaphosa*, *Melanophora*, and *Micaria*, comprising 17 known and 2 new species.

POLLOCK, FREDERICK. On the habits of some Madeiran Spiders. Ann. N. H. (4) x. pp. 271–274.

TACZANOWSKI, LADISLAS. Les Aranéides de la Guyane française. Hor. Ent. Ross. ix. (1872), pp. 64–111, pls. iii. & iv.

This paper (incomplete) is a continuation of that noticed in Zool. Rec. viii. p. 199. It includes notices and descriptions of 30 species of *Araneidea*, of which all but two are new, also characters of three new genera of the family *Thomisides*—*Acanthonotus*, *Isopus*, and *Senoculus*.

THORELL, TAMERLAN. Remarks on Synonyms of European Spiders.—No. 4. Upsala: 1872–73, pp. 375–644.

This Number brings the above valuable work to a conclusion. It completes the synonymic remarks on the genus *Attus*, based on Westring's 'Aranææ Suecicæ,' pp. 375–407. This is followed, pp. 407–414, by a list of the Spiders contained in Westring's work, with the names, both generic and specific, which are determined to have priority, contained in a parallel column. To this succeeds, pp. 414–470, "synonymic remarks on Spiders described in Blackwall's 'History of the Spiders of Great Britain and Ireland;'" and at pp. 471–493 is a "list of the Spiders described and figured" in that history. This list is exceedingly useful, containing paginal references to Blackwall's work, and also to the author's present and former work on European Spiders, together with the name, both generic and specific, considered in each case to have the priority, with the date of the same.

The third division of the work occupies pp. 494–544, and is headed "Synonymic remarks on some Spiders included in Simon's 'Catalogue Synonymique des Aranéides d'Europe.'" For the most part the Spiders here remarked upon are those European ones not included in either Westring's or Blackwall's work. Pp. 544–607 (concluding the work) are occupied with "additions and corrections," forming an exceedingly important part of it, and

containing also some valuable remarks on the classification of the *Araneidea*, and the systematic position of some recently described genera and species. At pp. 591–595 are some interesting observations on the present state of our knowledge of the impregnation of Spiders.

H. Lucas, R. Z. 1870, remarks on the spiders of Calvados, in a paper of general interest, containing little of scientific importance, beyond the occurrence of ♀ *Nephila fasciata* (Oliv.) so far north.

Hasselt, Tijdschr. Ent. 1871, pp. 46 & 47, remarks upon some Netherland *Araneidea* taken in June 1870.

Theraphosides.

Atypus sulzeri (Bl.) ♂ = *anachoreta* (Auss.) = *affinis* (Eichw.); ♀ = *piceus* (Sulz.): Thorell, Syn. Eur. Spid. p. 415.

Mygale mexicana, sp. n., Mexico: Bellevoye, Bull. Soc. Moselle, 1870.

Filistatides.

Filistata albimaculata, Jordan plains, *F. hirsuta*, Lebanon, spp. nn.: O. P. Cambridge, P. Z. S. 1872, pp. 216–218, pl. xiii. fig. 1.

Miltia diversa, sp. n., Hasbeiya, *id. ibid.* p. 219. T. Thorell, Syn. Eur. Spid. p. 601, questions the systematic position here given to *Miltia*, and, with L. Koch (Arachn. Austr. p. 300), considers it should form a separate family.

Œcobiides.

Œcobius trimaculatus, Jordan Plains, O. P. Cambridge, P. Z. S. 1872, p. 219, pl. xiii. fig. 7; *Œ. teliger*, Beirût, Tiberias, Jerusalem, and Hebron, *id. l. c.* p. 221, pl. xiii. fig. 8; *Œ. affinis*, Lebanon and Hasbeiya, *id. l. c.* p. 221; *Œ. albipunctatus*, Damascus, *id. l. c.* p. 222: spp. nn. The systematic position (with *Hersilia*) assigned to *Œcobius* by M. Simon, Mém. Liége, 1870, is questioned, and reasons given for its present place, *id. l. c.* p. 221. T. Thorell agrees in this view, Syn. Eur. Spid. p. 603.

Clotho septempunctata, sp. n., Ain Ata and Tiberias: O. P. Cambridge, *l. c.* p. 222.

Dysderides.

*Harpactes** *dufouri*, sp. n., Island of Pityusa: T. Thorell, *l. c.* p. 561.

Dysdera westringi, sp. n., Syria and Palestine, O. P. Cambridge, *l. c.* p. 223, pl. xiii. fig. 2. *D. erythrina* (Bl. & C. Koch) renamed *cambridgii*, T. Thorell, *l. c.* p. 465; *D. rubicunda* (Bl.) = *crocota* (C. Koch), *id. l. c.* pp. 466, 468, & 469; *D. maurusia*, sp. n., Algeria, *id. l. c.* pp. 466 & 467; *D. crocota* (C. Koch) and *D. rubicunda* (*id.*) differentially described, *id. l. c.* p. 468. *D. nicæensis*, p. 561, *D. lævigata*, p. 562, Nice; *D. pavesii*, Italy, p. 564; *D. pumila*, Island of Ophiusa (Formentara), p. 580: *id. l. c.*

Oonops punctatus, sp. n., Hasbeiya: O. P. Cambridge, *l. c.* p. 223, pl. xiv. fig. 3 A.

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* R. Templeton, Zool. Journ. v. p. 401, 1834 (not noticed in Agass. Nom. Zool.); Swainson, *Aves*, 1837; Milne-Edwards, *Crustacea*, 1840. [*Arpactus* (rectius *Harpactus*), Jurine, *Hymenopt.* 1807!]

Leptoneta, g. n., Eugène Simon, Ann. Soc. Ent. Fr. (5) ii. p. 477, pl. 16. figs. 11–19; *L. convexa*, sp. n., Cave of Peyort, near Ariége, *id. l. c.* p. 479, pl. 16. figs. 11–14: *L. microphthalma*, sp. n., Cave of Estellas, *id. l. c.* p. 480, pl. 16. figs. 17–19; *L. infuscata*, sp. n., Cave of Neuf-Fonds, near Ariége, *id. l. c.* p. 481, pl. 16. figs. 15 & 16.

Drassides.

Lampona (Thor.)=*Latona* (L. Koch). Genus fully characterized, with an analytical table of species. L. Koch, Arachn. Austr. pp. 362 & 363. *L. brevipes*, sp. n., Swan River, N. S. W., *id. l. c.* p. 363, pl. xxviii. figs. 3 & 3 *a*; *L. quadrimaculata*, sp. n., Bowen, *id. l. c.* p. 205, pl. xxviii. fig. 4; *L. fasciata*, sp. n., Port Mackay, *id. l. c.* p. 206, pl. xxviii. fig. 5; *L. flavipes*, sp. n., *id. l. c.* p. 368, pl. xxviii. figs. 6 & 6 *a*.

Gnaphosa ripariensis, sp. n., Jordan plains, O. P. Cambridge, *l. c.* p. 224, pl. xv. fig. 1; *G. plumalis*, sp. n., Jerusalem, Jericho, and Alexandria, *id. l. c.* p. 225, pl. xv. fig. 3; *G. excerpta*, sp. n., Nazareth, *id. l. c.* p. 226, pl. xv. fig. 4; *G. cambridgii*, sp. n., Palestine, *id. l. c.* p. 227, pl. xiii. fig. 3, and pl. xv. fig. 2; *G. lutata*, sp. n., Beirût, *id. l. c.* p. 228, pl. xv. fig. 7; *G. kochi*, sp. n., *id. l. c.* p. 229, pl. xv. fig. 6; *G. conspersa*, sp. n., Jordan plains and Egypt, *id. l. c.* p. 230, pl. xv. fig. 5; *G. palæstina*, sp. n., Tiberias, *id. l. c.* p. 231, pl. xv. fig. 8. *G. aussereri*, sp. n., South Tyrol, L. Koch, Zeitschr. Ferd. 1872 (?), p. 298. *G. cinerea*, sp. n., Prussia, A. Menge, Schr. Ges. Danz. p. 319, pl. 57. tab. 183. *G. petrobia*, sp. n., South Tyrol, L. Koch, Z. Ferd. 1872?, p. 302.

Drassus morosus, sp. n., Jerusalem, O. P. Cambridge, *l. c.* p. 232, pl. xv. fig. 9; *D. tenerrimus*, sp. n., Jordan plains and Hasbeiya, *id. l. c.* p. 233, pl. xv. fig. 10; *D. mundulus*, sp. n., Nazareth and Jordan plains, *id. l. c.* p. 234, pl. xv. fig. 11; *D. lacertosus*, sp. n., Jerusalem, *id. l. c.* p. 235, pl. xv. fig. 12; *D. senilis*, sp. n., Jordan plains and Egypt, *id. l. c.* p. 236, pl. xv. fig. 13; *D. invalidus*, sp. n., Jordan plains, *id. l. c.* p. 237, pl. xv. fig. 14; *D. nanus*, sp. n., Jericho and Jerusalem, *id. l. c.* pp. 237, 238, pl. xv. fig. 15; *D. infumatus*, sp. n., Jordan plains and Cairo, *id. l. c.* p. 238, pl. xv. fig. 16; *D. scrutatus*, sp. n., Jordan plains, *id. l. c.* p. 239, pl. xv. fig. 16 *a*; *D. omissus*, sp. n., Hebron, *id. l. c.* p. 239, pl. xv. fig. 17; *D. unicolor*, sp. n., Lebanon, *id. l. c.* p. 240, pl. xv. fig. 18.

Melanophora (C. Koch, *nec* Meigen, *Diptera*, 1838) changed to *Prosthesima*, L. Koch, Abh. Ges. Nürnb. vi. (1872) p. 139. *P. vernalis*, sp. n., Happurg, Fr. Jura, *id. l. c.* p. 140, pl. 1. figs. 17–19. *P. abdita*, sp. n., Prussia, A. Menge, Schr. Ges. Danz. p. 310, pl. 55. fig. 178. *P. talpina*, sp. n., South Tyrol, L. Koch, Z. Ferd. 1872 (?) p. 307. *P. rustica*, sp. n., Trent and Paris, *id. l. c.* pp. 309–311. *P. læta*, sp. n., Jordan, Jerusalem, and Cairo, O. P. Cambridge, P. Z. S. 1872, p. 241, pl. xv. fig. 19; *P. picina*, sp. n., Jordan plains and Alexandria, *id. l. c.* p. 242, pl. xv. fig. 20; *P. carbonaria*, sp. n., *id. l. c.* p. 242, pl. xv. fig. 21, *P. tragica*, sp. n., *id. l. c.* p. 243, pl. xv. fig. 22, *P. helvola*, sp. n., *id. l. c.* pp. 243, 244, pl. xv. fig. 23, Jordan plains; *P. scutata*, sp. n., Jericho, *id. l. c.* p. 244, pl. xv. fig. 24; *P. ursina*, sp. n., Jordan plains, *id. l. c.* p. 245, pl. xvi. fig. 25; *P. inaurata*, sp. n., Nain and Alexandria, *id. l. c.* p. 246, pl. xvi. fig. 26; *P. gracillima*, sp. n., Jordan plains, *id. l. c.* p. 247, pl. xvi. fig. 28; *P. carmeli*, sp. n., Mount Carmel, *id. l. c.* p. 248, pl. xvi. fig. 29.

Micaria splendidissima and *M. alpina*, spp. nn., South Tyrol, L. Koch, Z. Ferd. 1872 (?), pp. 311–313. *M. ignea*, sp. n., Jerusalem, O. P. Cambridge, *l. c.* p. 248, pl. xvi. fig. 30; *M. trifasciata*, sp. n., Haifa, *id. l. c.* p. 249, pl. xvi. fig. 31; *M. septempunctata*, sp. n., Lebanon and Hasbeiya, *id. l. c.* p. 250, pl. xvi. fig. 32; *M. nuptialis*, sp. n., Hebron and Jericho, *id. l. c.* p. 250, pl. xvi. fig. 33; *M. albimana*, sp. n., Nain, *id. l. c.* p. 251, pl. xvi. fig. 34.

Phrurolithus flavipes, sp. n., Hasbeiya and Lebanon, *id. l. c.* p. 252, pl. xvi. fig. 35.

Clubiona straminea, sp. n., Jordan plains, *id. l. c.* p. 252, pl. xvi. fig. 38; *C. gilva*, sp. n., Jericho, *id. l. c.* p. 253, pl. xvi. fig. 39; *C. contaminata*, sp. n., Jericho, *id. l. c.* p. 254, pl. xvi. fig. 40.

Chiracanthium annulipes, sp. n., Mount Tabor, *id. l. c.* p. 254, pl. xvi. fig. 36; *C. anceps*, sp. n., *id. l. c.* p. 255, pl. xvi. fig. 37. *C.* (*Clubiona*, Bl. *pt.*) *erraticum*, Bl., renamed [apparently without necessity, since no other species bearing the name *erraticum* has priority] *Chiracanthium fasciatum*, T. Thorell, Syn. Eur. Spid. p. 432.

Trachelas (L. Koch) fully characterized by its author, Abh. Ges. Nürnb. vi. p. 146; *T. nitescens*, sp. n., French Jura, *id. l. c.* p. 147, pl. ii. fig. 28. *T. minor*, sp. n., Jericho, O. P. Cambridge, *l. c.* p. 256, pl. xvi. fig. 41.

Hecaerge maculata, sp. n., Beirût and Jordan plains, *id. l. c.* p. 257; *H.? opiniosa*, sp. n., Lebanon, *id. l. c.* p. 258, pl. xvi. fig. 43.

H. (*Zora*) *spinimana* (Sim. Hist. Araign. p. 516) = *Z. ocreata* (Koch), T. Thorell, Syn. Eur. Spid. p. 534.

Agræca lycosiformis, Elisha's Well, Jordan plains, O. P. Cambridge, *l. c.* p. 258, pl. xvi. fig. 42; *A. haglundi*, Sweden and Germany, Thorell, *l. c.* p. 162: spp. nn.

Dictynides.

Eresus. Van Hasselt has a paper, chiefly on the geographical distribution of *E. annulatus*, in Tijdsch. Ent. 1872, pp. 113–117.

Dictyna consecuta, sp. n., Jerusalem, Damascus, O. P. Cambridge, *l. c.* p. 261; *D. puta*, sp. n., Jerusalem, *id. l. c.* p. 261; *D. innocens*, sp. n., Jordan plains, *id. l. c.* p. 262. *D. bifasciata*, sp. n., Upolu, L. Koch, Arachn. Austr. p. 323, pl. xxvi. figs. 1 *a–d*.

Agelenides.

Cambridgia, g. n. Closely allied to *Argyroneta*. L. Koch, *l. c.* p. 358. *C. fasciata*, sp. n., New Zealand, *id. l. c.* p. 359, pl. xxviii. fig. 2.

Amaurobius simplex, sp. n., Jerusalem, O. P. Cambridge, *l. c.* p. 262; *A. distinctus*, sp. n., Jordan plains and Alexandria, *id. l. c.* p. 263; *A. indistinctus*, sp. n., Jericho, *id. l. c.* p. 264; *A. ruficeps*, sp. n., Cana-el-Jelil, *id. l. c.* p. 264; *A.* (?) *inornatus*, sp. n., Rockhampton, N. S. W., L. Koch, *l. c.* p. 325, pl. xxvi. figs. 2 & 2 *a*; *A. senilis*, sp. n., *id. l. c.* p. 326, pl. xxvi. figs. 3 & 3 *a*; *A. chalybeius*, sp. n., Port Mackay and Port Denison, *id. l. c.* p. 328, pl. xxvi. figs. 4, 4 *a*, 4 *b*; *A. candidus*, sp. n., Bowen, *id. l. c.* p. 333, pl. xxvi. figs. 6 & 6 *a*; *A. insignis*, p. 330, and *A. robustus*, p. 331, pl. xxvi. figs. 5 & 5 *a*, New Holland, *id. l. c.*; *A. scalaris*, sp. n., Port Mackay, *id. l. c.* p. 334, pl. xxvi. figs. 7 & 7 *a*; *A. silvanus*, sp. n., Rockhampton, *id. l. c.* p. 337, pl. xxvii. figs. 1 & 1 *a*; *A. finschi*, sp. n., New Zealand, *id. l. c.* p. 339, pl. xxvii. figs. 2, 2 *a*, 2 *b*; *A. annulipes*, sp. n., Rockhampton, *id. l. c.* p. 341, pl. xxvii. figs. 3, 3 *a*, 4, 4 *a*, 4 *b*. *A. segestrinus*, Sydney, N. S. W., *id. l. c.* p. 343, pl. xxvii.

figs. 5 & 5 *a*. *A. roscidus* (Sim. Hist. Araign. p. 461) = *Cœlotes segestriiformis* (Duf.), T. Thorell, Syn. Eur. Spid. p. 502; *A. ferox* and *A. montanus* (Sim. *l. c.* p. 462) = *A. claustrarius* (Hahn), *id. l. c.* p. 503.

Lethia [= *Ciniflo*, Bl. *pt.*] *mengii*, sp. n., England, O. P. Cambridge, Tr. L. S. xxviii. p. 441, pl. xxxviii. fig. 7.

Desis vorax, sp. n., Upolu, L. Koch, *l. c.* p. 345, pl. xxix. figs. 1 & 1 *a–f*; *D. martensi*, sp. n., Singapore, *id. l. c.* p. 347, pl. xxix. figs. 2 & 2 *a–g*.

Cœlotes? immaculatus, sp. n., England, O. P. Cambridge, Tr. L. S. xxviii. p. 444.

Cœlotes saxatilis (Bl.) = *C. atropos*, Walck. The latter name is to stand. Thorell, Syn. Eur. Spid. p. 437.

Titanœca (Thor.), L. Koch, Abh. Ges. Nürnb. vi. (1872) pp. 153–170, describes, among others, *T. schmeri*, sp. n., Vienna, p. 159; *T. flavicoma*, sp. n., Sabinergebirge, p. 163; *T. tristis*, sp. n., Switzerland, Italy, and Greece, p. 167. *T. quadriguttata*, Hahn, = *Eucharium obscurum* (Sim. Hist. des Araign. p. 467), T. Thorell, Syn. Eur. Spid. p. 506.

Lachesis meadii, sp. n., Jordan plains, O. P. Cambridge, P. Z. S. 1872, p. 265, pl. xiii. fig. 4; *L. blackwalli*, sp. n., Jerusalem and Beirût, *id. l. c.* p. 266, pl. xiii. fig. 5.

Habronestes, g. n., L. Koch, Arachn. Austr. p. 299 [= *Storena*, Walck. *pt.*, Cambr. & Thor.]. *H. striatipes*, sp. n., Rockhampton and Bowen, *id. l. c.* p. 313, pl. xxv. figs. 4 *a–d*; *H. scenicus*, sp. n., Bowen, *id. l. c.* p. 316, pl. xxv. figs. 6 *a–e*; *H. spirifer*, sp. n., Port Mackay, *id. l. c.* p. 318, pl. xxv. figs. 7 *a–d*. Nine other known species are described and figured, *id. l. c.* pp. 302–323, pl. xxv.

Palæstina, g. n.: intermediate between *Lachesis* and *Enyo*. O. P. Cambridge, P. Z. S. 1872, p. 268. *P. dentifera*, sp. n., Jordan plains, *id. l. c.* p. 268; *P. expolita*, sp. n., Mount Carmel, Nain, Lebanon, *id. l. c.* p. 269, pl. xiii. fig. 6; *P. sexoculata*, sp. n., Jerusalem, *id. l. c.* p. 270.

Enyo luctuosa, sp. n., Jordan plains, *id. l. c.* p. 270; *E. atriceps*, sp. n., Lebanon, *id. l. c.* p. 271; *E. lutipes*, sp. n., Jordan plains and Jerusalem, *id. l. c.* p. 272.

Cithæron, g. n.: between *Enyo* and *Agelena*. *Id. l. c.* p. 272. *C. prædonium*, sp. n., Lebanon and Hasbeiya, *id. l. c.* p. 273.

Agelena subfusca (Cambr.) = *A. nava* (Bl.): *id.* Tr. L. S. xxviii. p. 443.

Tegenaria annulipes, sp. n., Lebanon, *id.* P. Z. S. 1872, p. 275. *T. silvestris*, sp. n., Tyrol, L. Koch, Z. Ferd. 1872 (?), p. 288; *T. tridentina*, sp. n., Trent, *id. l. c.* p. 292; *T. foliata*, sp. n., New Zealand, *id.* Arachn. Austr. p. 356. *T. cinerea* (Panz.) = *T. cicurea* (Fabr. & C. Koch): T. Thorell, Syn. Eur. Spid. p. 514.

Textrix caudata, sp. n., Meran, Trieste, and Italy, L. Koch, Z. Ferd. 1872?, p. 283.

Chorizomma, g. n.: allied to *Tegenaria* and *Hahnia*, but with only six eyes. Eugène Simon, Ann. Soc. Ent. Fr. (5) ii. p. 220, pl. 12. fig. 6. *C. subterranea*, sp. n., Cave of Ariége, *id. l. c.* p. 221, pl. 12. figs. 6–9.

Miturga gilva, sp. n., Ports Mackay and Denison, and Rockhampton, L. Koch, Arachn. Austr. p. 354, pl. xxvii. figs. 8 & 8 *a*.

Micaria splendidissima and *M. alpina*, spp. nn., South Tyrol, L. Koch, Z. Ferd. 1872 (?), pp. 311–313. *M. ignea*, sp. n., Jerusalem, O. P. Cambridge, *l. c.* p. 248, pl. xvi. fig. 30; *M. trifasciata*, sp. n., Haifa, *id. l. c.* p. 249, pl. xvi. fig. 31; *M. septempunctata*, sp. n., Lebanon and Hasbeiya, *id. l. c.* p. 250, pl. xvi. fig. 32; *M. nuptialis*, sp. n., Hebron and Jericho, *id. l. c.* p. 250, pl. xvi. fig. 33; *M. albimana*, sp. n., Nain, *id. l. c.* p. 251, pl. xvi. fig. 34.

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Chiracanthium annulipes, sp. n., Mount Tabor, *id. l. c.* p. 254, pl. xvi. fig. 36; *C. anceps*, sp. n., *id. l. c.* p. 255, pl. xvi. fig. 37. *C.* (*Clubiona*, Bl. *pt.*) *erraticum*, Bl., renamed [apparently without necessity, since no other species bearing the name *erraticum* has priority] *Chiracanthium fasciatum*, T. Thorell, Syn. Eur. Spid. p. 432.

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Hecaerge maculata, sp. n., Beirût and Jordan plains, *id. l. c.* p. 257; *H.? opiniosa*, sp. n., Lebanon, *id. l. c.* p. 258, pl. xvi. fig. 43.

H. (*Zora*) *spinimana* (Sim. Hist. Araign. p. 516) = *Z. ocreata* (Koch), T. Thorell, Syn. Eur. Spid. p. 534.

Agræca lycosiformis, Elisha's Well, Jordan plains, O. P. Cambridge, *l. c.* p. 258, pl. xvi. fig. 42; *A. haglundi*, Sweden and Germany, Thorell, *l. c.* p. 162: spp. nn.

Dictynides.

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Agelenides.

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Amaurobius simplex, sp. n., Jerusalem, O. P. Cambridge, *l. c.* p. 262; *A. distinctus*, sp. n., Jordan plains and Alexandria, *id. l. c.* p. 263; *A. indistinctus*, sp. n., Jericho, *id. l. c.* p. 264; *A. ruficeps*, sp. n., Cana-el-Jelil, *id. l. c.* p. 264; *A.* (?) *inornatus*, sp. n., Rockhampton, N. S. W., L. Koch, *l. c.* p. 325, pl. xxvi. figs. 2 & 2 *a*; *A. senilis*, sp. n., *id. l. c.* p. 326, pl. xxvi. figs. 3 & 3 *a*; *A. chalybeius*, sp. n., Port Mackay and Port Denison, *id. l. c.* p. 328, pl. xxvi. figs. 4, 4 *a*, 4 *b*; *A. candidus*, sp. n., Bowen, *id. l. c.* p. 333, pl. xxvi. figs. 6 & 6 *a*; *A. insignis*, p. 330, and *A. robustus*, p. 331, pl. xxvi. figs. 5 & 5 *a*, New Holland, *id. l. c.*; *A. scalaris*, sp. n., Port Mackay, *id. l. c.* p. 334, pl. xxvi. figs. 7 & 7 *a*; *A. silvanus*, sp. n., Rockhampton, *id. l. c.* p. 337, pl. xxvii. figs. 1 & 1 *a*; *A. finschi*, sp. n., New Zealand, *id. l. c.* p. 339, pl. xxvii. figs. 2, 2 *a*, 2 *b*; *A. annulipes*, sp. n., Rockhampton, *id. l. c.* p. 341, pl. xxvii. figs. 3, 3 *a*, 4, 4 *a*, 4 *b*. *A. segestrinus*, Sydney, N. S. W., *id. l. c.* p. 343, pl. xxvii.

figs. 5 & 5 *a*. *A. roscidus* (Sim. Hist. Araign. p. 461) = *Cœlotes segestriiformis* (Duf.), T. Thorell, Syn. Eur. Spid. p. 502; *A. ferox* and *A. montanus* (Sim. *l. c.* p. 462) = *A. claustrarius* (Hahn), *id. l. c.* p. 503.

Lethia [= *Ciniflo*, Bl. *pt.*] *mengii*, sp. n., England, O. P. Cambridge, Tr. L. S. xxviii. p. 441, pl. xxxviii. fig. 7.

Desis vorax, sp. n., Upolu, L. Koch, *l. c.* p. 345, pl. xxix. figs. 1 & 1 *a–f*; *D. martensi*, sp. n., Singapore, *id. l. c.* p. 347, pl. xxix. figs. 2 & 2 *a–g*.

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Lachesis meadii, sp. n., Jordan plains, O. P. Cambridge, P. Z. S. 1872, p. 265, pl. xiii. fig. 4; *L. blackwalli*, sp. n., Jerusalem and Beirût, *id. l. c.* p. 266, pl. xiii. fig. 5.

Habronestes, g. n., L. Koch, Arachn. Austr. p. 299 [= *Storena*, Walck. *pt.*, Cambr. & Thor.]. *H. striatipes*, sp. n., Rockhampton and Bowen, *id. l. c.* p. 313, pl. xxv. figs. 4 *a–d*; *H. scenicus*, sp. n., Bowen, *id. l. c.* p. 316, pl. xxv. figs. 6 *a–e*; *H. spirifer*, sp. n., Port Mackay, *id. l. c.* p. 318, pl. xxv. figs. 7 *a–d*. Nine other known species are described and figured, *id. l. c.* pp. 302–323, pl. xxv.

Palæstina, g. n.: intermediate between *Lachesis* and *Enyo*. O. P. Cambridge, P. Z. S. 1872, p. 268. *P. dentifera*, sp. n., Jordan plains, *id. l. c.* p. 268; *P. expolita*, sp. n., Mount Carmel, Nain, Lebanon, *id. l. c.* p. 269, pl. xiii. fig. 6; *P. sexoculata*, sp. n., Jerusalem, *id. l. c.* p. 270.

Enyo luctuosa, sp. n., Jordan plains, *id. l. c.* p. 270; *E. atriceps*, sp. n., Lebanon, *id. l. c.* p. 271; *E. lutipes*, sp. n., Jordan plains and Jerusalem, *id. l. c.* p. 272.

Cilhæron, g. n.: between *Enyo* and *Agelena*. *Id. l. c.* p. 272. *C. prædonium*, sp. n., Lebanon and Hasbeiya, *id. l. c.* p. 273.

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Tegenaria annulipes, sp. n., Lebanon, *id.* P. Z. S. 1872, p. 275. *T. silvestris*, sp. n., Tyrol, L. Koch, Z. Ferd. 1872 (?), p. 288; *T. tridentina*, sp. n., Trent, *id. l. c.* p. 292; *T. foliata*, sp. n., New Zealand, *id.* Arachn. Austr. p. 356. *T. cinerea* (Panz.) = *T. cicurea* (Fabr. & C. Koch): T. Thorell, Syn. Eur. Spid. p. 514.

Textrix caudata, sp. n., Meran, Trieste, and Italy, L. Koch, Z. Ferd. 1872?, p. 283.

Chorizomma, g. n.: allied to *Tegenaria* and *Hahnia*, but with only six eyes. Eugène Simon, Ann. Soc. Ent. Fr. (5) ii. p. 220, pl. 12. fig. 6. *C. subterranea*, sp. n., Cave of Ariége, *id. l. c.* p. 221, pl. 12. figs. 6–9.

Miturga gilva, sp. n., Ports Mackay and Denison, and Rockhampton, L. Koch, Arachn. Austr. p. 354, pl. xxvii. figs. 8 & 8 *a*.

Hersiliides.

Hersiliada simoni, sp. n., plains of the Jordan and Jerusalem, O. P. Cambridge, P. Z. S. 1872, p. 275, pl. xiv. fig. 9.

Scytodides.

Scytodes marmorata, sp. n., Upolu and Rarotonga: L. Koch, Arachn. Austr. p. 292, pl. xxiv. figs. 4 *a–e*.

Dictis, g. n., *id. l. c.* p. 294: between *Scytodes* and *Loxoscelis*. *D. striatipes*, sp. n., Upolu, Tonga, and Viti Islands, *id. l. c.* p. 294, pl. xxiv. figs. 5 *a–c*.

Pholcides.

Pholcus tipuloides, sp. n., Upolu, L. Koch, *l. c.* p. 281, pl. xxiii. figs. 5 *a–g*; *P. sphæroides*, sp. n., Rockhampton, *id. l. c.* p. 283, pl. xxiii. figs. 6 *a–d*.

Theridiides.

Rhomphæa, g. n.: between *Pholcus* and *Ariamnes*; rather nearest to the latter. L. Koch, *l. c.* p. 289. *R. conicles*, sp. n., Upolu, *id. l. c.* p. 290, pl. xxiv. figs. 3 *a–f*.

Arianne gracilis, sp. n., Upolu, *id. l. c.* p. 252, pl. xxi. figs. 3, 3 *a*; *A. malleiformis*, sp. n., Upolu, *id. l. c.* p. 254, pl. xxi. figs. 4 *a–c*, 5, 5 *a*. *A. longicaudata*, sp. n., Beirût, O. P. Cambridge, P. Z. S. 1872, p. 277, pl. xiv. fig. 11A.

Argyrodes sublimis, sp. n., Ovalau, L. Koch, Arachn. Austr. p. 251, pl. xxi. figs. 2 *a* & *b*. *A. syriaca*, sp. n., Beirût, O. P. Cambridge, *l. c.* p. 279, pl. xiii. fig. 10.

Theridion[*-ium*] *limitatum*, sp. n., Sydney and Port Mackay, L. Koch, Arachn. Austr. p. 256, pl. xxi. figs. 5 *a–b*; *T. setosum*, sp. n., Upolu, *id. l. c.* p. 261, pl. xxii. figs. 1 & 1 *a*; *T. mollissimum*, sp. n., *id. l. c.* p. 262, pl. xxii. fig. 2; *T. mundulum*, sp. n., Port Mackay, *id. l. c.* p. 263, pl. xxii. figs. 3 & 3 *a*; *T. crinitum*, sp. n., New Holland, *id. l. c.* p. 271, pl. xxii. figs. 8 & 8 *a*; *T.* (?) *ambiguum*, sp. n., Upolu, *id. l. c.* p. 273, pl. xxii. figs. 9 & 9*a*. *T. umbraticum*, sp. n., Tyrol, *id.* Z. Ferd. 1872 (?), p. 243; *T. petræum*, sp. n., *id.* Z. F. p. 246; *T. pinastri*, sp. n. *id.* Z. F. p. 249. *T. apicatum*, sp. n., Nazareth, O. P. Cambridge, P. Z. S. 1872, p. 281; *T. particeps*, sp. n., Hebron, *id. l. c.* p. 282; *T. scriptum*, sp. n., Jordan plains and Alexandria, *id. l. c.* p. 283; *T. inscriptum*, Lebanon, and *T. erigoniforme*, Jordan plains, spp. nn., *id. l. c.* p. 284; *T. conspicuum*, sp. n., Syria and Palestine, *id. l. c.* p. 285, pl. xiii. fig. 11. *Theridion projectum* (Cambr.) = *Pholcomma projectum* (Thor.) = *Erigone gibba*, Westr., *id.* Tr. L. S. xxviii. p. 445, pl. xxxiii. no. 8.

Lathrodectus pallidus, sp. n., Jordan plains, *id.* P. Z. S. 1872, p. 287. *L. malmignathus*, Walck., = *L. tredecim-guttatus*, Rossi: T. Thorell, Syn. Eur. Spid. p. 508. *L. menavodi* (Vins.) figured in Vinson's 'Voyage à Madagascar,' pl. iv. figs. 4 & 4 *a*.

Steatoda triangulosa (Walck.) = *Eucharium triangulifer* (*id.*), T. Thorell, *l. c.* p. 505.

Euryopis umbilicata, sp. n., Port Mackay: L. Koch, Arachn. Austr. p. 274, pl. xxiii. figs. 1 & 1 *a–b*.

Erigone = *Neriene* (Bl. *ad part.* + Walckenaera, Bl.). *E. incauta*, Jerusalem and Lebanon, *E. inexpedibilis*, Hasbeiya, spp. nn., O. P. Cambridge, P. Z. S. 1872, p. 289; *E. dentata*, Reuss-Wid., var. n. *orientalis*, Jordan plains, *id.*

l. c. p. 290; *E. femoralis*, sp. n., Jordan plains, *E. dentipalpis* (Westr.), var. n. *syriaca*, Hasbeiya, *id. l. c.* p. 291; *E. spinosa*, Paris, Rome, Egypt, and Palestine, pl. xiii. fig. 12, *E. pastoralis*, Mount Tabor, spp. nn., *id. l. c.* p. 292; *E. pavida*, sp. n., Hasbeiya, *id. l. c.* p. 293, pl. xiv. fig. 22. *E. conspicua*, sp. n., England and Scotland, *id.* Tr. L. S. xxviii. p. 449, pl. xxxiv. no. 25; *E.* (*Drepanodus*, Menge) *albipunctata*, sp. n., England, *id. l. c.* p. 451, pl. xxxiv. no. 15; *E. lucida*, sp. n., *id. l. c.* p. 452, pl. xxxiv. no. 27. *E. bifida*, *E. anomala*, *E. subtilis*, *E. innotabilis*, *E. conigera*, *E. bicuspis*, *E. latifrons*, *E. trifrons*, *E. altifrons*, and *E. affinitata* (Cambr.), *E. brevipes* (Westr.), *E. sylvatica* and *E. gibbosa* (Bl.), and *E. nudipalpis* (Westr.) figured for the first time: O. P. Cambridge, *ibid.* pls. xxxiv. & xxxv. *E. globipes*, sp. n., Neuhaus, French Jura, L. Koch, Abh. Ges. Nürnb. vi. p. 138, pl. 1. fig. 13. *E. hortensia*, sp. n., Tyrol, L. Koch, Z. Ferd. 1872 (?), p. 256; *E. truncorum*, sp. n., South Tyrol, *id. l. c.* p. 259; *E. adipata*, sp. n., Tyrol, *id. l. c.* p. 263; *E. broccha*, sp. n., Tyrol, *id. l. c.* p. 266; *E. montigena*, sp. n., *id. l. c.* p. 269; *E. æstiva*, sp. n., *id. l. c.* p. 271; *E. litoralis*, sp. n., Venice, *id. l. c.* p. 274; *E. tirolensis*, sp. n., Tyrol, *id. l. c.* p. 277; *E. lucisca*, sp. n., Cave of Ariége, Eugène Simon, Ann. Soc. Ent. Fr. (5) ii. p. 219, pl. 12. figs. 1–5; *E. spelæa*, sp. n., Cave of Neuf-fonts, Ariége, *id. l. c.* p. 474, pl. 16. figs. 8 & 9. O. P. Cambridge, in P. Z. S. 1872, pp. 747–769, pls. lxv. & lxvi., describes spp. nn.:—*E. arietans*, p. 748, pl. lxv. fig. 1, and *E. incomta*, p. 748, pl. lxv. fig. 2, Nuremberg; *E. forensis*, Rome, p. 749, pl. lxv. fig. 3; *E. prominula*, England and Nuremberg, p. 750, pl. lxv. fig. 4; *E. inconspicua*, Nuremberg, p. 751, pl. lxv. fig. 5; *E. romana*, Rome, p. 752, pl. lxv. fig. 6; *E. sila*, p. 753, pl. lxv. fig. 7, and *E. pallens*, p. 753, pl. lxv. fig. 8, Nuremberg; *E. biscissa*, Beirût, p. 754, pl. lxv. fig. 9; *E. græca*, Corfu, p. 755, pl. lxv. fig. 10; *E. alexandrina*, Egypt, p. 755, pl. lxv. fig. 11; *E. simoni*, Paris and Nuremberg, p. 756, pl. lxv. fig. 12; *E. sarcinata*, p. 757, pl. lxv. fig. 13, and *E. digitata*, p. 758, pl. lxvi. fig. 14, Nuremberg; *E. kochi*, Warsaw and Nuremberg, p. 759, pl. lxvi. fig. 15; *E. monodon*, Glacier of Adamallo, South Tyrol [incorrectly given as "Nuremberg," *l. c.*], p. 759, pl. lxvi. fig. 16; *E. scurrilis*, p. 760, pl. lxvi. fig. 17; *E. similis*, p. 761, pl. lxvi. fig. 18; *E. prægracilis*, p. 762, pl. lxvi. fig. 19; *E. saltuensis* [=*E. saltuum*, L. Koch, Z. Ferd. 1872?, p. 259], p. 763, pl. lxvi. fig. 20; *E. cito*, p. 764, pl. lxvi. fig. 21; *E. blackwalli*, p. 765, pl. lxvi. fig. 22, and *E. elegans*, p. 766, pl. lxvi. fig. 23, Nuremberg; *E. alpina*, p. 767, pl. lxvi. fig. 24, Bruck-am-Muir, Styria. *E. rufipes* (Bl.) renamed *E.? lapidicola*, Thorell, Syn. Eur. Spid. p. 443; *E. parva*, Bl., = *E.? minima* (Walck.), *id. l. c.* p. 445; *E.* [*Walckenaera*] *atra* (Bl.) renamed *E. sordidata*, *id. l. c.* p. 452.

Erigone (*Micryphantes*) *rurestris* (C. Koch). A. W. M. Hasselt, Arch. Néerl. vii. pp. 460–465, in observations upon copulation in this species, questions the correctness of Menge's & Ausserer's theories upon that act in the *Arachnida*.

E. (*M.*) *inæqualis*. On copulation in this species, *cf.* C. Ritsema, Tijdschr. Ent. (2) vii. p. xxviii.

Cyllognatha, g. n.: allied to *Linyphia*, *Theridion*, and *Ero*. L. Koch, Arachn. Austr. p. 248. *C. subtilis*, sp. n., Upolu, *id. l. c.* p. 249, pl. xx. figs. 7 *a–f*, and pl. xxi. figs. 1 *a–c*.

Linyphia albuloides, sp. n., Jericho, O. P. Cambridge, P. Z. S. 1872, p. 293; *L. congener*, sp. n., Lebanon, *id. l. c.* p. 294. *L. oblivia*, sp. n., England, *id.*

Tr. L. S. xxviii. p. 446, pl. xxxiv. no. 13; *L. setosa* (Cambr.) and *L. pullata* (*id.*), England, figured for the first time, *id. ibid.* pl. xxxiii. no. 10, & pl. xxxiv. no. 12. *L. glacialis*, sp. n., Tyrol, L. Koch, Z. Ferd. 1872 (?), p. 240. *L. cavernarum*, sp. n., Muggendorf, *id.* Abh. Ges. Nürnb. vi. p. 127, pl. 1. fig. 1, *L. rosenhaueri*, sp. n., Rosenmüllershöhle, &c., French Jura, *id. l. c.* p. 128, pl. 1. figs. 2–5; *L. troglodytes*, sp. n., *id. l. c.* p. 131, pl. 1. figs. 6–8. *L. collina*, sp. n., Happurg and Hartmannshof, *id. l. c.* p. 134, pl. 1. figs. 9–12. *L. proserpina*, sp. n., Cave of Reinfourcaud, Ariége: E. Simon, Ann. Soc. Ent. Fr. (5) ii. p. 475, pl. 16. figs. 6 & 7. *L. sanctivincenti*, sp. n., Cave of St. Vincent, Basses-Alpes, *id. l. c.* p. 476, pl. 16. fig. 10.

Pachygnatha mandibularis (Luc.), Jersey, Serk, Rome, and Egypt. Reasons for doubting its position in *Theridion* or *Epeira*. O. P. Cambridge, P. Z. S. 1872, pp. 294 & 295. = *Zilla rossi* (Thor.), Thorell, Syn. Eur. Spid. pp. 554 & 555.

Epeirides.

Meta mengii (Bl.) = *M. inclinata* (Bl.) = *M. segmentata* (Clk.): O. P. Cambridge, Tr. L. S. xxviii. p. 454. Thorell, *l. c.* p. 556, corrects the opinion expressed to the same effect concerning the specific identity of the above, *id.* p. 39.

Tetragnatha molesta, Jordan plains and Beirût, sp. n., O. P. Cambridge, P. Z. S. 1872, p. 295; *T. minitabunda*, sp. n., Hasbeiya and Damascus, *id. l. c.* p. 296; *T. perlongipes*, sp. n., Jordan plains, *id. l. c.* p. 296. *T. filiformis*, sp. n., French Guiana: L. Taczanowski, Hor. Ent. Ross. ix. (no. 1) p. 111. *T. extensa* (Bl.): Thorell makes of this sp. (= *T. extensa*, Linn.) three distinct forms or varieties, *T. extensa* (*vera*), *T. solandri* (Scop.), and *T. obtusa* (Koch): Syn. Eur. Spid. p. 459.

Epeira inconveniens, Beirût, *E. neta*, Jordan plains and Tiberias, spp. nn., O. P. Cambridge, *l. c.* p. 298; *E. incongrua*, sp. n., Hebron, *id. l. c.* p. 299; *E. perplicata*, sp. n., Jericho, Tiberias, Beirût, and Nazareth, *id. l. c.* p. 300. *E. umbratica* (Menge), ♂ probably = *ixobola*, sp. n., Austria: T. Thorell, Syn. Eur. Spid. p. 545.

Argiope epeiroides, sp. n., Jordan plains, O. P. Cambridge, *l. c.* p. 301. *A. bruennichi* (Scop.) = *Nephila fasciata* (Oliv. &c.) and *N. transalpina* (C. Koch), T. Thorell, Syn. Eur. Spid. p. 518; *A. aurelia* (Walck.) = *A. trifasciata* (Forsk.), *id. l. c.* p. 519; *A. sericea* (Sav. &c.) = *A. lobata* (Pallas), *id. l. c.* p. 520.

Uloborides.

Hyptiotes (*Mithras*) *paradoxus* and its web figured and described by Ferdinando Sordelli, Atti Soc. Ital. xiv. (1872) pt. iv. pp. 24–30, pl. 1. The systematic position assigned to this Spider by various authors is also reviewed, and finally determined to be in the *Epeiridæ*.

Thomisides.

Thomisus foka (Vinson) figured in Vinson's 'Voyage à Madagascar,' pl. iv. figs. 3, 3 *a*, *b*.

Thomisus (= *Thomisus*, Bl.) *edax*, Jordan and Jerusalem, *T. varius*, Hebron and Jordan plains, spp. nn., O. P. Cambridge, P. Z. S. 1872, p. 303; *T. tristrami*, sp. n., Palestine and Syria, *id. l. c.* p. 304, pl. xiv. fig. 16; *T. rigidus*, sp. n., Jordan plains, *id. l. c.* p. 305; *T. claviger*, Jordan plains and Naza-

reth, *T. rectilineus*, Beirût, *T. plorator*, Jerusalem, spp. nn. *id. l. c.* p. 306; *T. setiger*, sp. n., Beirût, *id. l. c.* p. 307, pl. xiv. fig. 15; *T. spinifer*, sp. n., Jordan plains and Egypt, *id. l. c.* p. 308, pl. xiv. fig. 14. *T. cambridgii* ♂ (Cambr.) = *Xysticus impavidus* (Thor.), T. Thorell, Syn. Eur. Spid. pp. 230 and 425. *T. audax* (Bl.) = *Xysticus pini* (Hahn), and differs from *X. cristatus*, var. *a*, which Thorell formerly thought it to be; *id. l. c.* p. 236 *et seq.* and p. 424. *T. pallidus* (Bl.) = *X. horticola* (C. Koch); *T. versutus* (Bl.) = *X. atomarius* (Panz.); *T. incertus* (Bl.) = *X. praticola* (C. Koch): *id. l. c.* p. 426. *T. abbreviatus* (Bl.) = *T. onustus* (Walck.); *T. rufopictus*, sp. n., England: O. P. Cambridge, Tr. L. S. xxviii. p. 436 [since ascertained to be a variety of *T.* (*Xysticus*) *sabulosus* (Koch)]. *T. simplex* (Cambr.), England, figured for first time, *id. l. c.* p. 431, pl. xxxiii. no. 2. *T. denticulata* (Walck.) = *Aranea tricuspidata* (Fabr.), T. Thorell, Syn. Eur. Spid. p. 539. *T.* (*Xysticus*) *lanio* (Sim. Hist. Araign. p. 523) = *X. fuscus* (Koch) = *X. morio* (*id.*), *id. l. c.* p. 538. *T.* (*X.*) *robustus* (Sim. *l. c.* p. 522) = *X. fucatus* (Walck.), *id. l. c.* p. 535. *T.* (*X.*) *æquinoctialis*, Cayenne, p. 87; *T.* (*X.*) *bipunctatus*, St. Laurent de Maroni, p. 88; *T. nigripes*, p. 88, *T. citroides*, p. 89, *T. guianensis*, p. 90, Cayenne; *T. trituberculatus*, p. 92, pl. iv. fig. 7, Cayenne and Safety Isles; *T. rugosus*, p. 95, *T. echinatus*, p. 97, *T. comatus*, p. 98, pl. iv. fig. 8, *T. trispinosus*, p. 99, *T. quinquetuberculatus*, p. 100, *T. sexpunctatus*, p. 101, Cayenne; *T. episcopalis*, St. Laurent de Maroni, p. 102: L. Taczanowski, Hor. Ent. Ross. ix. (no. 1), spp. nn.

Monaxtes lucasi, p. 81, pl. iv. fig. 5, *M. jelskii*, p. 83, Cayenne: *id. l. c.*, spp. nn.

Acanthonotus, g. n.: nearly allied to *Monaxtes*, with resemblance in the eyes to *Pachygnatha*. *A. guianensis*, sp. n., St. Laurent de Maroni, *id. l. c.* p. 86, pl. iv. fig. 6.

Senoculus, g. n.: allied to *Monaxtes*, with some affinity to *Eripus*. *S. maronicus*, sp. n., St. Laurent de Maroni, *id. l. c.* p. 108, pl. iii. fig. 4.

Thanatus punctulatus, sp. n., French Guiana, *id. l. c.* p. 73.

Isopus, g. n.: bears some analogy to *Thanatus* and some resemblance to *Tetragnatha*; placed provisionally among the *Thomisides*. *I. longipes*, sp. n., Cayenne, *id. l. c.* p. 105, pl. iv. fig. 9.

Philodromus thorelli, sp. n., Palestine and Syria, O. P. Cambridge, P. Z. S. 1872, p. 309; *P. setigerus*, sp. n., near Nazareth, *id. l. c.* p. 310; *P. medius*, sp. n., Jordan plains, Nazareth, Cana-el-Jelil, Carmel, and Beirût, *id. l. c.* p. 311; *P. cayanus*, sp. n., Cayenne, L. Taczanowski, *l. c.* p. 74.

Heteropoda (*Olios*) *kochi*, sp. n., Jerusalem and Jericho, O. P. Cambridge, *l. c.* p. 312, pl. xiv. fig. 13. *H. rubripes*, p. 75, *O. gracilipes*, p. 76, Cayenne; *O. nigriventris*, p. 78, Uassa; *O. cayanus*, p. 79, *O. quinquelineatus*, p. 80, Cayenne: L. Taczanowski, *l. c.*, spp. nn.

LYCOSIDES.

Lycosa syriacus, sp. n., Jordan plains: O. P. Cambridge, *l. c.* p. 320.

Dolomedes consocius, sp. n., Jordan plains, Lebanon, and plain of Esdraelon: *id. ibid.*

Lycosa. F. Pollock, in a paper "On the habits of some Madeiran Spiders," Ann. N. H. (4) x. pp. 271–274, makes some remarks on the food and distribution of *L. ingens* (Bl.) and other species. His assertions and generalizations are questioned by O. P. Cambridge, *ibid.* *L. dissonans*, sp. n., Jordan plains,

Beirût, and Damascus, *id.* P. Z. S. 1872, p. 316; *L. ejusmodi*, sp. n., Mt. Hermon, *id. l. c.* p. 317; *L. deserta*, Damascus; *L. effera*, Jericho, Hebron, Lebanon, and Beirût, spp. nn., *id. l. c.* p. 318; *L. fidelis*, sp. n., Jericho, Beirût, Egypt, and Bombay, *id. l. c.* p. 319.

L. (*Tarentula*) *apuliæ* (Sim. Hist. d'Araig. p. 510) = *Tarentula fasciiventris*, Duf.; *L. pallida* (*id.* p. 513) = *L. wagleri* (Hahn): T. Thorell, Syn. Eur. Spid. pp. 526 & 533. *L. atrata*, Sweden and Lapland, p. 576, *L.* (*T.*) *simonis*, France, p. 326, *L. pernix*, Northern Sweden, p. 308, *L. nebulosa*, Southern Europe, p. 330, spp. nn.; *L. captans* (Walck.) = *L.* (*T.*) *radiata* (Latr.), both sexes of which are described: *id. l. c.*

Sphasides.

Pasithea virescens, sp. n., Jerusalem, O. P. Cambridge, P. Z. S. 1872, p. 314.

Oxyopes sobrinus and *O. optabilis*, spp. nn., Jordan plains, *id. l. c.* p. 315.

Salticides.

Salticus (Bl.) *attus* (Sim.). H. Lucas has a paper entitled "Quelques mots sur le *Merpissus muscosus* de Clerck, Aranéide de la tribu des Attides," Ann. Soc. Ent. Fr. (5) i. pp. 461 & 462.

O. P. Cambridge, P. Z. S. 1872, describes (in addition to the record of 33 other known species) the following spp. nn.:—*S.* (*Rhanis*, Koch) *insignis*, Hebron, p. 325; *S. putus*, Mount Hebron, p. 326; *S. devorans*, Jordan plains, p. 327; *S. heliophanoides*, near Kedes and Beirût, p. 328; *S. epularis*, Hasbeiya, p. 329; *S. simoni*, Lebanon, p. 329; *S. particeps*, Jerusalem, p. 330; *S. staintoni*, Jordan plains, p. 331, pl. xiv. fig. 20; *S. congener*, Jordan plains, p. 332; *S. patagiatus*, Tiberias and Mount Tabor, p. 332; *S. nepos*, Jerusalem, p. 333; *S. pascualis*, Nain, p. 334; *S. clemens*, Jordan plains, p. 335; *S. conveniens*, Jerusalem, p. 336; *S. cognatus*, Lebanon, p. 337; *S. politiventris*, Palestine and Syria, p. 337; *S. approximans*, Jordan plains, p. 338; *S. æratus*, p. 339; *S. spiniger*, Hebron, Jerusalem, and Egypt, p. 339; *S. fulgens*, Palestine, Syria, and Egypt, p. 340, pl. xiv. fig. 17; *S.* (*Dendryphantes*, Sim.) *dumicolus*, Jordan plains and Nazareth, p. 341; *S.* (*Menemerus*, Sim.) *indistinctus*, Jerusalem, p. 342; *S.* (*M.*) *flavescens*, Lebanon, p. 343; *S.* (*Heliophanus*) *facetus*, Jerusalem, Hebron, p. 344; *S.* (*H.*) *mordax*, p. 344, and *S.* (*H.*) *curvidens*, p. 345, Jordan plains; *S.* (*H.*) *dentatidens*, Jordan plains, Nazareth, Carmel, Damascus; and *S.* (*H.*) *furcatus*, Nain, p. 346.

S. cephalotes (Sim., MS.), p. 321, = *S. algerinus* (Lucas); *S. caricis* (Westr.), recorded for first time as British, *id.* Tr. L. S. viii. p. 435, = *Attus riparius* and *A. atellanus* (Sim.), T. Thorell, Syn. Eur. Spid. p. 394. *S. formicarius* (Bl.), explanation of figure and description in Blackwall's Brit. & Ir. Spid. p. 64, pl. iii. fig. 36: O. P. Cambridge, Tr. L. S. xxviii. p. 435.

S. (*Attus*) *bidens*, p. 64, pl. iii. fig. 1; *S.* (*A.*) *cabanisi*, p. 66; *S.* (*A.*) *cancrimanus*, p. 68, pl. iii. fig. 2, Uassa (French Guiana), L. Taczanowski, Hor. Ent. Ross. ix. (no. 1). *S.* (*A.*) *medius* (Westr.) = *Dendryphantes rudis* (Sund.), T. Thorell, Syn. Eur. Spid. p. 376; *S.* (*A.*) *sparsus* (Bl.) + *S. terebratus* (Cambr.) and *S.* (*A.*) *praticola* (Cambr.) = *A. pubescens* (Fabr., C. Koch), *id. l. c.* p. 381; *S.* (*A.*) *sanguinolentus* (Westr. &c.) = *Philœus* (*Aranea*) *chrysops* (Poda), *id. l. c.* p. 388; *S.* (*A.*) *tigrinus* (Westr.), *S. distinctus* (Bl.), = *A. erra-*

tucus (Walck.), *id. l. c.* p. 396; *S.* (*A.*) *latabundus* (Westr.) renamed *S.* (*Euophrys*) *pœcilopus*, *id. l. c.* p. 403; *S.* (*A.*) *frontalis* (Westr. & Walck.)=*S. reticulatus* (Bl.), *id. l. c.* p. 404; *S.* (*A.*) *heterophthalmus* (Westr.)=*Ballus œnescens* (Sim.), *id. l. c.* p. 405; *S.* (*A.*) *rapax*, sp. n., closely allied to *A. pubescens* (Fabr.), Austria, *id. l. c.* p. 382; *S.* (*A.*) *mancus*, sp. n., nearly allied to *A. floricola* (Koch), Scandinavia, *id. l. c.* p. 393.

Jelskia gracilis, sp. n., Uassa (French Guiana), L. Taczanowski, *l. c.* p. 70, pl. iii. fig. 3.

THELYPHONIDEA.

Phrynides.

Dr. R. Meyer, Zool. Gart. xiii. p. 190, records the occurrence of *Phrynus lunatus* in Germany.

Curculioides prestvici, Buckland, a fossil species from the Ironstone of the Dudley coal-field, is not a beetle, but an Arachnid, allied to *Phrynus*, and for which the generic name *Eophrynus* is proposed. H. Woodward, Rep. Br. Ass. 1871, p. 112, and Nature, iv. p. 376; *cf.* also Am. Nat. v. p. 733.

Thelyphonides.

A. G. Butler, in "A Monograph of the Genus *Thelyphonus*," Ann. N. H. (4) x. pp. 200–206, pl. xiii., includes 21 species, of which the following are treated as new:—*T. mexicanus*, Mexico, p. 201, fig. 1; *T. amazonicus*, Santarem, *ibid.* fig. 2; *T. proboscideus*, Ceylon, p. 203, fig. 3; *T. formosus*, Moulmein, *ibid.* fig. 4; *T. pugnator*, Philippine Islands, p. 204, fig. 5; *T. lucanoides*, Corea, p. 205, fig. 6; *T. sinensis*, Hong Kong, p. 205, fig. 7; *T. rufus* (loc. ign.), *ibid.* fig. 8. He separates the species of *Thelyphonides* into three sections, according to the number of teeth (sect. *a*, 5; sect. *b*, 2; sect. *c*, 6) on the upperside of the 2nd joint of the palpi ("cheliceres").

Tartarides (fam. nov.).

O. P. Cambridge, Ann. N. H. (4) x. pp. 409–413, pl. xxii. [translated into French by Eugène Simon, Ann. Soc. Ent. Fr. (5) ii. pp. 486–488], characterizes a new family under the name *Tartarides*, distinguished by a divided cephalothorax and the absence of eyes, for the reception of a new genus, *Nyctalops*, comprising *N. crassicaudata*, fig. 1, and *N. tenuicaudata*, fig. 2, Ceylon: spp. nn.

SCORPIONIDEA.

Scorpionides.

R. T. Lowne, in a paper "On the development of the nervous system of the Annulosa," M. Micr. J. viii., Dec. 1872, pp. 259–262, pl. 40 *pt.*, remarks on the embryology of the Scorpion, and confirms Metschnikoff's observations in Z. wiss. Zool. xxi. p. 204.

Eugène Simon, Ann. Soc. Ent. Fr. (5) ii., records *Buthus crassicauda* (Oliv.), p. 247, *B. peloponnensis* (C. Koch), p. 248, *B. nigrocinctus* (Hempr. & Ehrenb.), p. 249, *B. leptochelis* (*iid.*), p. 250, *B. tunetanus* (Herbst), p. 251, *B. judaicus*, sp. n., p. 252, Syria and Palestine; *Hemiscorpio hierichonticus*, sp. n., Jordan valley, p. 255; *Heterometrus palmatus* (Hemp. & Ehr.), p. 258, Lebanon; *H. propinquus*, sp. n., p. 259, Damascus and Nablous.

Scorpio tergestinus (C. Koch), var. n. *austriacus*, J. A. Ferrari, Verh. z.-b. Wien, xxii. pp. 655–658.

Pseudoscorpionides.

Ludwig Koch publishes an exhaustive paper on the European genera and species of this family, under the title 'Uebersichtliche Darstellung der europäischen Chernetiden (Pseudoscorpionen).' Nürnberg: 1873, pp. 68. In it analytical tables are given of the genera and of the species of each genus separately.

The genera are:—1. *Chiridium* and *Chernes* (Menge), *Chelifer* (Geoffr.), *Olpium*, and *Garypus* (gg. nn.). 2. *Blothrus* (Schiödte), *Roncus* (g. n.), *Chthonius* (C. Koch), *Obisium* (Illiger).

The species are:—*Chiridium muscorum* (Leach), Germany &c.; *Chernes reussi* (C. Koch), Germany, France, and Corsica; *C. scorpioides* (Herm), *C. wideri* (C. Koch), Germany; *C. hahnii* (C. Koch), Europe generally, including England; *C. cyrneus*, Corsica; *C. iberus*, patr. ign.; *C. lacertosus*, Corsica; *C. mengii*, S. Tyrol: spp. nn.

Species doubtful or unknown to the author:—*Scorpio cimicoides* (Fabr.), *Chelifer parasita* (Herm.), *C. geoffroyi* (Leach), *Chernes oblongus* (Menge), *Chelifer cancroides* (Linn.), generally distributed; *C. schæfferi* (C. Koch), Germany and Corsica; *C. granulatus* (*id.*), Nürnberg; *C. trivides* (Hahn), Bavaria; *C. lampropsalis*, France, Italy, Corsica, Tyrol; *C. meridianus*, Corsica; Italy, Greece; *C. tingitanus*, Morocco; *C. hispanus*, Spain; *C. disjunctus*, Pyrenees; *C. heterometrus*, Syra; *C. maculatus*, Corsica and Villafranca; *C. peculiaris*, Basses-Alpes, Dryne, St. Tulle: spp. nn.

Species of *Chelifer* doubtful or unknown to the author:—*C. nepoides* (Herm.), *Obisium muscorum* (Leach), *Chelifer latreillii* and *C. olfersi* (Leach), *C. sesamoides* (Savigny), *C. saltator*, *C. fabricii*, and *C. degeeri* (Brébisson), and *C. depressus* (C. Koch), *C. brachydactylus*, *C. tuberculatus*, and *C. pediculoides* (Luc.), *C. rhododactylus* (Menge).

Olpium dimidiatum, Greek islands, *O. chironomum*, Botzen, *O. græcum*, Greece: spp. nn.; *O. hermanni* (Sav., *nec* Leach), Corsica, Greece, Egypt, Canary Islands.

Garypus minor and *G. litoralis*, spp. nn., Corsica. Other species of *Garypus* doubtful or unknown to the author, *Obisium beauvoisi* (Savigny).

Blothrus spelæus (Schiödte), Carinthia; *B. abeillii* (Sim.), Ariége.

Roncus lubricus, England, Corsica, *R. cambridgii*, England, *R. alpinus*, S. Tyrol: spp. nn.

Chthonius rayi, France, England, S. Tyrol, *C. tenuis*, France, Corsica: spp. nn.; *C. trombidioides*, England, Germany; *C. orthodactylus* (Leach), France, Germany. Species of *Chthonius* doubtful or unknown to the author, *C. maculatus* (Menge).

Obisium simoni, France, *O. cavernarum*, Ariége, *O. validum*, Syria, *O. simile*, Paris, Corsica, *O. manicatum* (Greece), *O. erythrodactylum*, Breslau and Cracow, *O. jugorum*, La Grance and Tyrol: spp. nn.; *O. sylvaticum* (C. Koch), France, Germany; *O. fuscimanum* (C. Koch), hab. ign.; *O. dumicola* (C. Koch), Germany, Corsica, Dalmatia; *O. muscorum* (*id.*), France, Corsica, Greece; *O. carcinoides* (Herm.), France. Species doubtful or unknown to author: *O. maritimum* and *O. hermanni* (Leach), *O. theisianum* (Walck.), *O.*

walckenaeri (de Théis), *O. bravaisii* (Gerv.), *O. corticale* (Hahn), *O. gracile* and *O. dubium* (C. Koch), *O. pallipes* (Luc.).

Of the whole family, there are 47 described (of which 28 are unknown to the author) and 29 new species, in all 76.

Blothrus abeillii, sp. n., Cave of Estellas, Ariége, E. Simon, Ann. Soc. Ent. Fr. (5) ii. p. 224, pl. 12. fig. 10, where also attention is called (p. 223) to the insufficiency of Schiödte's diagnosis of the genus *Blothrus* (Dans. Selsk. Skr. 1851).

SOLPUGIDEA.

Galeodes syriacus, p. 261, *G. furcellatus*, p. 264, spp. nn., Syria: E. Simon, *l. c.*

PHALANGIDEA.

Opilionides.

Ischyropsalis dispar, Orduno-Biscaya, p. 227, pl. 12. figs. 11 & 12; *I. robusta*, Gerez, Tras-os-Montes, p. 230, fig. 13, spp. nn.: E. Simon, *l. c.* pl. 12 (& pl. 16. figs. 1 & 2). *I. luteipes*, Ariége, Cave of Le Quère, sp. n., *id. l. c.* p. 484, pl. 16. figs. 2, 5, 5*a*.

Gonyleptides.

Erebomaster, g. n., E. D. Cope, Am. Nat. vi. no. 7, p. 420; *E. flavescens*, sp. n., Wyandotte Cave, N. America, *id. ibid.*

Phrixis, g. n., closely allied to *Acanthocheir*, *id. l. c.* p. 421; *P. longipes*, sp. n., Mammoth Cave, Kentucky, *id. l. c.*

Scotolemon lucasi, sp. n., Caves of Ariége, E. Simon, Ann. Soc. Ent. Fr. (5) ii. p. 234, pl. 12. figs. 14 & 15; *S. piochardi*, sp. n., Cave of Albia, near Orduno, *id. l. c.* p. 236, pl. 12. figs. 18 & 19; *L. terricola*, sp. n., Porto Vecchio, *id. l. c.* p. 237, pl. 12. figs. 16 & 17.

Trogulides.

Cyphophthalmus corsicus, sp. n., Corsica, E. Simon, Ann. Soc. Ent. Fr. (5) ii. p. 240, pl. 12. fig. 20.

ACARIDEA.

Cheyletus, *Glyciphagus*, and *Tyroglyphus*. Fumouse and Robin, J. l'Anat. Phys. no. 5, Sept. & Oct. 1872, pls., and R. Z. (2) xxiii. p. 159, publish an anatomical and zoological memoir on species of these genera. An undescribed *Tyroglyphus* exists in most collections.

Ixodes dugesi and *Argas reflexus*. G. Gulliver notes the eggs and newly hatched young of these species found in Kent, Ann. N. H. (4) x. p. 230: *cf.* also Q. J. Micr. Sci. (n. s.) xii. pp. 424 & 425.

Argas reflexus (Latr.) = *Rhynchoprion columbæ* (Herm.) = *Ixodes marginatus* (Fabr.) is described and stated to be new to the British fauna in P. Maidst. Soc. (Q. J. Micr. Sci. *l. c.* p. 205). See also Gulliver, *l. c.* ix. p. 242.

For a short note on the progression of Arachnids in opposition to gravity, and referring to "Physiological Researches" by Dr. Davy (1863, p. 336), *cf.* Q. J. Micr. Sci. *l. c.* p. 425.

Acarides.

Acarellus pulicis and *A. muscæ*, spp. nn., Britain: J. G. Tatem, M. Micr. J. viii. (1872) p. 263 *et seq.*, pl. xl. *pt.*

Ixodides.

Adenopleura, g. n., A. Macalister, Q. J. Micr. Sci. (n. s.) xii. (no. 47), pp. 287, 288, pl. xiv. figs. 5–8; *A. compressa*, sp. n., West Africa, found on skin of *Manis multiscutata*, *id. ibid.*

Ixodes dugesi. For an account of swarms on sheep, lambs, pheasants, ferrets, and dogs, in the neighbourhood of Canterbury, *cf.* P. Maidst. Soc., Q. J. Micr. Sci. *l. c.* pp. 316 & 317; and for some valuable microscopic observations on the same species by Dr. Kersey, *ibid.* pp. 318 & 319.

Eschatocephalus frauenfeldi, Rosenmüllershöhle, near Muggendorf, *E. seidlitzi*, in caves at Almas, French Jura, spp. nn.: L. Koch, Abh. Ges. Nürnb. vi. pp. 150–51, pl. ii. fig. 29.

Hydrachnides.

H. A. Nicholson, in his "Contribution to a Fauna Canadensis," being an account of the animals dredged in Lake Ontario in 1872, records a "fine species of *Limnochares*" as extremely abundant in shallow water and ponds; and a species of *Hydrachna* abundant in Toronto Bay in from 1 to 2 fathoms.

Gamasides.

Professor Leidy, in P. Ac. Philad., Jan. 1872, pls. 9 & 10. figs. 1–3, communicates a letter from Dr. C. G. Turnbull "on a mite in the ear of the ox." Subsequently named, *l. c.* p. 138, *Gamasus auris*, sp. n.

Sarcoptes anachantes. G. Roster, Bull. Ent. Ital. iv. pp. 169–174, pl. 3, describes the external anatomy and various stages of a species doubtfully so referred, under the trivial name "Acaro dell' Allodola."

MYRIOPODA

BY

The Rev. O. P. Cambridge, M.A., C.M.Z.S.

Plateau, Félix. Matériaux pour la Faune Belge. 2me note. Myriapodes. Bull. Ac. Belg. (2) xxxiii. Sep. copy, pp. 21, 2 pls.

Includes 11 genera and 24 species (one new) as Belgian.

Porath, C. A. von. Myriapodes de l'Afrique méridionale conservés au Musée de Stockholm. Pt. I. Chilopodes. Œfv. Ak. Förh. 1871 (no. 9), pp. 1135–1167.—Pt. II. Diplopodes. *L. c.* 1872 (no. 5), pp. 3–45, pl.

The Recorder has not seen these papers; but from an analytical review of them by A. Humbert, J. Zool. ii. pp. 191–192, it appears that Part I. includes 30 species of Chilopods (of which 22 are described as new), distributed amongst the following 9 genera:—*Scutigera*, 2 sp.; *Henicops*, 1 sp. n.; *Scolopendra* 12, of which 11 are new; *Cormocephalus*, 9 spp. nn.; *Eucorybas*, 1 sp.; *Cryptops*, 1 sp. indeterm.; *Heterostoma*, 1 sp.; *Trematoptychus*, 1 sp. n.; *Geophilus*, 2 spp. indeterm.

Part II. includes descriptions of 42 species of Chilognaths (of which 32 are new), distributed among 7 genera, 2 of which are new; *Sphærotherium*, 8 spp. (4 new), subgen. *Polydesmus*; *Paradesmus*, 1 sp., subgen. *Icosidesmus*, 1 sp. n.; *Eurydesmus*, 1 sp. n.; *Iulomorpha*, g. n., 1 sp. n.; *Spirobolus*, 7 spp. (3 new), subgen. *Spirostreptus*; *Nodopyge*, 17 spp. (14 new), subgen. *Odontopyge*, 5 spp. (4 new); *Alloporus*, g. n., 1 sp. n.

CHILOGNATHA.

Zephronia chitonoides, p. 354, pl. xviii. figs. 2, 2*a*, Madras and Ceylon; *Z. rugulosa*, p. 355, pl. xviii. fig. 1; *Z. noticeps*, p. 355, *Z. corrugata*, p. 355, *Z. leopardina*, p. 356, Ceylon; *Z. tigrina*, East Indies, p. 356, fig. 7; *Z. zebraica*, Bombay, p. 356, fig. 4; *Z. nigrinota*, Sikkim and Assam, p. 356, fig. 9; *Z. lutescens*, India, p. 356; *Z. ignobilis*, Java, p. 357; *Z. pilifera*, Ceylon, p. 357; *Z. innominata* ("Newport"), Philippines, p. 357, fig. 8; *Z. sulcatula*, Borneo, p. 357. fig. 5: spp. nn., A. G. Butler, Ann. N. H. (4) x. pl. xviii.

Sphærotherium latum, *S. neptunus*, Madagascar, p. 358, pl. xviii. figs. 3 & 6; *S. fraternum*, Victoria, Australia, p. 359; *S. nigrum*, South Africa, p. 359, fig. 11; *S. sinuatum*, Sarawak, p. 359, fig. 10: spp. nn., *id. l. c.*

Iulomorpha [*Iulimorpha*: vox hybr.], g. n., Porath, *l. c.* Principally distinguished from other genera of the fam. *Iulides* by the "lamina labialis" being divided into two parts by a transverse suture. *I. kinbergi*, sp. n., Cape of Good Hope.

Alloporus, g. n., *id. l. c.* Differs from all known species of *Iulides* by the "pores répugnatoires," instead of beginning at the 6th, being found on the 5th segment; the mandibles have 8 teeth; the first four segments are open below; otherwise this genus comes very near to *Spirostreptus* (subgen. *Nodopyge*). *A. dissimilis*, sp. n., Caffraria.

Polyzonium germanicum (Gerv. & Waga). F. Meinert has a monograph on this species, found in Denmark, "Tillæg til Danmarks Chilognather," Nat. Tids. (3) vi. (1870). This paper is analyzed and reviewed by A. Humbert, J. Zool. ii. pp. 189–191.

CHILOPODA.

Eucorybas grandidieri (*cf.* Zool. Rec. ii. pp. 376 & 378). H. Lucas gives an elaborate account of this species in Ann. Soc. Ent. Fr. (5) i. pp. 445–451, pl. 7. figs. 1–7. Its differences from *E. crotalus* (Gerstäcker) are minutely pointed out.

Cryptops (Leach). Plateau, *l. c.* p. 8, pl. 1, briefly refers to and figures various portions of the external anatomy of *C. savignii*, *agilis*, and *hortensis*, pointing out that the disposition and number of the minute teeth on the underside of the 3rd and 4th joints of the anal pair of legs will probably be found of use in determining the value of exotic species.

Himantarium gervaisi, sp. n., *id. l. c.* pp. 8–11, pl. 2, Ghent.

INSECTA.

THE GENERAL SUBJECT

By E. C. Rye.

Hagen, H. Mimicry in the Colours of Insects. Am. Nat. vi. pp. 388–393; Ent. M. M. ix. pp. 78–83.

A preliminary sketch of the origin and nature of markings, under the heads colour and pattern. Colours are either produced by interference of light, or are epidermal or hypodermal. The latter only are capable of being influenced (voluntarily or otherwise) by the insect, and it may be possible to prove that the so-called mimetic colours are all hypodermal. Patterns or markings on the body mostly represent underlying muscles, and may be caused by the development of the latter creating a greater oxidation of the neighbouring parts; those on the wings are probably caused by the sudden rush of fluids in the act of transformation [but they appear in miniature long before that act in the *Lepidoptera*, and do not appear until some time after it in the *Coleoptera* and some other orders].

Heyden, L. von. Bericht über die von Herren Dr. Noll und Dr. Grenacher auf Tenerife gesammelten Insekten. Ber. senck. Ges. 1872, pp. 74–90.

A few species of all orders are enumerated, with particulars as to their geographical distribution &c.

Kaltenbach, J. H. Die Pflanzenfeinde aus der Klasse der Insekten.—I. Stuttgart: 1872, 8vo, pp. 288, woodcuts.

This work (reviewed in Ent. M. M. ix. p. 22; B. E. Z. xvi. p. 396) commences a revised edition, under an entirely different arrangement, of the author's work on the same subject in Verh. Ver. Rheinl. The insects are discussed under the headings of the plants which they respectively attack; and the present portion includes from the *Ranunculaceæ* to *Daucus*.

Lichtenstein, J. Manuel d'Entomologie, à l'usage des horticulteurs du midi de la France. Montpellier: 1872, 8vo, 83 pp.

Reviewed in Pet. Nouv. no. 57, p. 229.

Lohde, Georg. Insectenepidemien, welche durch Pilze hervorgerufen werden. B. E. Z. xvi. pp. 17–44, pls. i.–iii.

Discusses the development of the fungi *Botrytis bassiana, Isaria farinosa, Cordyceps militaris, Empusa muscæ*, and *E. radicans*.

Oustalet, E. Recherches sur les Insectes fossiles des terrains tertiaires de la France.—Part I. Insectes fossiles de l'Auvergne. Ann. Sci. Géol. ii. No. 2 (1872), pp. 1–176, pls. i.–vi.

After a review of the literature on the entire subject (pp. 1–26). and a geological description of the tertiary strata of Auvergne and the principal deposits of fossil insects there, the author discusses in detail the species discovered, as follows:—Coleoptera (scheme of classification founded on sculpture &c. of elytra, modified from that of Heer, pp. 51–54, pl. i. figs. 13 & 14). *Eunectes antiquus*, p. 56, pl. i. figs. 1 & 2, *Laccobius priscus*, p. 59, fig. 3, *Brachycerus lecoquii*, p. 65, fig. 4, *Cleonus arvernensis*, p. 67, figs. 5 & 6, *C. fouilhouxi*, p. 68, fig. 7, *Hylobius deletus*, p. 70, fig. 8, *Anisorhynchus effossus*, p. 72, fig. 9, *Plinthus redivivus*, p. 74, fig. 10, *Bagous atavus*, p. 76, fig. 11, *Curculionites ovatus*, p. 77, fig. 12. Orthoptera, *sp.* p. 78, pl. ii. fig. 1. Neuroptera: *Libellula minuscula*, p. 88, pl. ii. fig. 6, *Ascalaphus edwardsi*, p. 93, figs. 8 & 9. Hymenoptera: *Anthophorites gaudrii*, p. 104, pl. ii. figs. 12 & 13. Diptera: *Penthetria vaillanti*, p. 112, pl. iii. figs. 1 & 2, *Plecia major*, p. 114, pl. ii. fig. 19, pl. iii. figs. 3 & 4, *P. nigrescens*, p. 115, pl. iii. figs. 5–10, *P. pallida*, p. 118, pl. iii. figs. 11–13, *Bibio gigas*, p. 122, pl. iv. figs. 1–4, *B. ungeri*, Heer (p. 123, pl. i. fig. 16, *a–c*), var. *marginatus*, p. 125, pl. iii. fig. 14, pl. iv. fig. 5, *B. macer*, p. 126, pl. iv. fig. 6, *B. alacris*, p. 127, pl. iii. fig. 15, *B. robustus*, p. 128, pl. iv. figs. 7–9, *B. edwardsi*, p. 130, pl. v. figs. 1–5, *B. cylindratus*, p. 133, pl. iv. fig. 12, *B. gracilis*, Unger, var. *minor*, p. 134, pl. iii. fig. 16, *B. obsoletus*, Heer?, p. 136, pl. iv. fig. 13, *B. larteti*, p. 137, pl. iv. figs. 10 & 14, *Protomyia longa*, Heer, p. 139, pl. v. fig. 16, *P. longipennis*, p. 141, pl. vi. fig. 1, *P. inflata*, pl. v. fig. 17, *P. lugens*, pl. vi. figs. 2 & 3, p. 142, *P. joannisi*, p. 143, pl. vi. figs. 4 & 14, *P. fusca*, pl. iv. fig. 15, *P. adusta*, pl. v. fig. 18, p. 145, *P. sauvagii*, p. 146, pl. vi. fig. 6, *P. globularis*, p. 147, pl. vi. fig. 7, *P. blanchardi*, p. 148, pl. vi. fig. 5, *P. rubescens*, p. 149, pl. iv. figs. 16 & 17, *P. formicoides*, p. 150, pl. iv. fig. 18, pl. v. fig. 19, *P. incerta*, p. 151, pl. v. figs. 20 & 21, pl. i. fig. 16, *Stratiomys heberti*, p. 156, pl. vi. figs. 11–14. Lepidoptera: *Noctuites incertissima*, p. 158, pl. i. fig. 18. These are all described as new, with the exception of those referred to Heer and Unger; and in all cases the characters of the genera and higher groups are detailed, with observations on the specific analogies to existing forms. The author gives an abstract of the results furnished by the study of fossils, and sketches the climate and vegetation of Auvergne during the tertiary period.

Packard, Jun., Alpheus S. Embryological Studies on Hexapodous Insects. Mem. Peab. Ac. i. (No. 3), pp. 18, pls. 3.

Consists of the following articles:—i. Development of *Nematus ventricosus*, pl. 1; ii. of *Pulex canis*, pl. 2; iii. of *Attelabus rhois*, pl. 3. figs. 1–5; iv. of *Telephorus fraxini*, pl. 3. figs. 6–8; v. of *Gastrophysa polygoni*, pl. 3. fig. 9, and of *Mysia* 13-*punctata*; vi. of *Chrysopa oculata*, pl. 3. figs. 10–13.

The development of the *Nematus*, and probably of all the *Tenthredinidæ*, accords in the main features with that of the honey-bee; that of *Pulex* with *Chironomus* and *Simulium*, and of the *Attelabus*, *Gastrophysa*, and *Mysia* with *Donacia*. The *Telephorus* differs from all other *Coleoptera* the early stages of which are known, in the primitive band floating in the centre of the yelk, instead of surrounding it. As a whole, the mode of development (except in the *Telephorus*, which resembles the *Hemiptera* and *Libellulidæ*) is nearly identical in the *Coleoptera* with that of the *Diptera* and *Hymenoptera*. The *Chrysopa* does not differ essentially from the *Libellulidæ*. There is remarkable uniformity in the mode of development in the *Hexapoda*, as much as in the decapodous *Crustacea*; but embryological characters can scarcely be defined, even for suborders. If found, they will probably be in the advanced embryo.

Packard, Jun., Alpheus S. Record of American Entomology for the year 1871. IV. Rep. Peab. Ac. pp. 99–147.

Riley, Charles V. Fourth Annual Report on the noxious, beneficial, and other Insects of the State of Missouri. Jefferson City, Mo.: 1872, pp. 145, 66 woodcuts.

Rondani, Camillo. Degli Insetti parassiti e delle loro Vittime. Bull. Ent. Ital. iv. pp. 41–78, 229–258, 321–342.

Completes the alphabetical list mentioned in Zool. Rec. viii., discussing the remainder of the parasitic *Hymenoptera*, the *Diptera*, *Coleoptera*, &c. Indications of new species are given in it.

——. Degli Insetti nocivi e dei loro Parassiti. *Ibid.* pp. 137–165.

Commences an inversion of the above-mentioned notes, the insect attacked being the text, and the parasites forming the notes to it. The *Lepidoptera* (alphabetically, to *Leuconea*) are discussed.

Seidlitz, Georg. Die Parthenogenesis und ihr Verhältniss zu den übrigen Zeugungsarten im Thierreich. Leipsig: 1872.

Thomson, Carl Gustav. Opuscula Entomologica. Fasciculus quartus. Lund: 1871, pp. 361–452.

Additions to the Swedish fauna in *Coleoptera* and *Hemiptera*, with descriptions of new species.

Turtaudière, P. A. Millet de la. Faune des Invertébrés de Maine-et-Loire. Angers: 1870, i., 1872, ii., 8vo.

Verrill, A. E. The External and Internal Parasites of Man and Domestic Animals. Hartford, U.S.A.: 1870, 8vo, pp. 140, woodcuts.

Of the *Insecta* the well-known parasites belonging to the *Rhynchota*, *Diptera*, and *Mallophaga* are discussed.

Wood, J. G. Insects at Home: being a Popular Account of British Insects, their Structures, Habits, and Transformations. London: 1872, pp. 670, plates and many woodcuts.

On the study of entomology: J. A. Harker, Scot. Nat. i. pp. 249–254.

On the danger of generalizing from too limited an area, as exemplified in entomology. H. T. Stainton, Ent. Ann. 1873, p. 83 *et seq.*

Fossil insects. S. H. Scudder, Am. Nat. vi. pp. 665–668, records 39 certain species from shale near the junction of the Green and White Rivers, Colorado (Wyoming), chiefly *Diptera* and *Coleoptera*. Exact particulars of the discovery of these insects are given by F. C. A. Richardson, *ibid.* p. 666, note. The species of *Mycetophilidæ* and *Tipulidæ* agree best with other fossils from the tertiary beds of the same region.

Insect-origin. B. T. Lowne, Nature, v. p. 183; A. R. Wallace, Presid. Address, E. Soc. Lond., Anniv. 1872, *ibid.* p. 350; J. J. Murphy, Nature, vi. p. 373; F. B. White, *ibid.* p. 393; Delpino, Bull. Ent. Ital. iv. p. 342 *et seq.*; (and Geology) G. Schoch, MT. schw. ent. Ges. iv. pp. 25–29.

Physiology. The primitive element of muscle is a cell, which, by elongation, forms a fibre. Kunckel, CR. Ac. Sc. 5 Aug. 1872, R. Z. (2) xxiii. p. 454.

In Bull. Ent. Ital. iv. pp. 175–186, pl. 2. figs. 2–10, are some notes by A. Targioni-Tozzetti on the internal anatomy of insects, chiefly concerning a form of epithelial cell found in the intestinal tube of the larva of *Apis ligustica*, which is compared with a corresponding form in *Oniscus*.

Theory as to the origin of wings: CR. Ent. Belg. xv. p. lxv.

The tracheæ have no respiratory function in aquatic larvæ, which breathe like other aquatic animals. They merely keep a uniform layer of air under the skin of the pupa, so as to prevent friction. The respiratory organs of the pupa accumulate a quantity of air in the œsophagus, which, emitted suddenly from the anus, assists mechanically in the exclusion of the perfect insect. Monnier, CR. Ac. Sc. 22 Jan. 1872; R. Z. (2) xxiii. p. 231.

Terrestrial *Coleoptera* resist asphyxia from submersion for periods varying up to nearly 100 hours. Aquatic species (and aquatic *Hemiptera*) perish sooner, possibly on account of their greater activity in the water, accompanied by a greater loss of oxygen. Aquatic insects resist cold, at zero, for an indefinite time, but rapidly die in ice, on account of their being entirely deprived of movement. The higher temperatures supported in safety by insects are very limited in extent, corresponding with those of certain known thermal springs in which *Articulata* are found. These observations apply to temperate Europe. F. Plateau, Bull. Ac. Belg. xxxiv. nos. 9 & 10.

Life in salt and fresh water. In R. Z. (2) xxiii. p. 73, reporting CR. Ac. Sc. July 1871, is an analysis, by the same author, of his "Recherches physico-chimiques sur les Articulés aquatiques," as follows:—Freshwater *Articulata*, with thick integument and no branchiæ, live with impunity in salt water, in which those with thin skin and branchial respiration die quickly, the combinations of sodium and magnesium acting as poison; saltwater *Crustacea* die in fresh water, as the salts necessary for their existence are taken up in it from their tissues. Difference of density is immaterial.

Specific gravity of insects. The same author communicates (Ann. N. H. 4, x. pp. 55–57) an abstract of his researches in Arch. Sci. Nat. xliii. (1872) upon this subject. His conclusions are so varied, and of so little practical use to entomologists, that it seems unnecessary to do more than indicate the existence of the work. As an instance of the apparent impossibility of defining any standard as to the centre of gravity in insects, it may be observed that in Dragonflies, of nearly the same external aspect, the relative positions of the centre in the same sex vary from the posterior margin of the metathorax to the first third of the 3rd abdominal segment. G. Vimercati, Bull. Ent. Ital. iv. pp. 188–200, gives a general notice on this subject, recapitulating Plateau's experiments and their result (Table, p. 196).

M. Girard's 'Études sur la chaleur libre degagée par les animaux invertébrés et spécialement des Insectes' (Paris: 1869, 4to, reviewed in R. Z., 2, xxii. p. 35 *et seq.*: *cf.* Gerstäcker, Ber. Ent. in Arch. f. Nat. xxxix. Bd. iii. p. 2) has not been seen by the Recorder.

The male element in insects indirectly connected with defective vitality. C. V. Riley, Am. Nat. vi. p. 692.

Parthenogenesis. A notice in Bull. Ent. Ital. iv. p. 384 *et seq.*, by Siebold, under the head "Intorno alla partenogenesi riconosciuta nelle Farfalle di antichi Italiani," although relating to *Lepidoptera* more particularly, may be noted here. The observations of Castellet, Réaumur, Rossi, and Ochsenheimer are quoted.

Insects and birds. The conclusions of Édouard Perris (Mém. Liége; reviewed in Nouv. et Faits, p. cxlv) are:—1, that birds only congregate at the epochs of migration, when most insects are comparatively rare; and when insects are in masses, birds are isolated; 2, that although birds destroy large quantities of insects, the really noxious species of these are in comparatively very small numbers, and in destroying them much vegetable produce and useful insects are also destroyed; 3, that the most destructive insects are in various ways protected from attacks by birds; and, 4, that larvæ, which are especially noxious, are especially protected.

Injury to agriculture: *cf.* observations by Ghiliani, Bull. Ent. Ital. iv. p. 32; Piccioli, *ibid.* p. 226; Tozzetti, *ibid.* p. 228; *cf.* also pp. 316–319.

Plant-fertilization. T. H. Farrer, "On the fertilization of a few common Papilionaceous flowers," Nature, vi. pp. 478–480, figs. 1–8, pp. 498–501, figs. 9–17. C. J. Hayden, *ibid.* p. 60 (*Dictamnus*). W. C. Marshall, *ibid.* p. 393 (*Lepidoptera*). Thos. Meehan, "On the agency of Insects in obtruding evolution," P. Ac. Philad. 1872, pp. 235-237, chiefly from an examination of variations in *Linaria vulgaris*, comes to the conclusion that insects are "not always abettors, but rather at times conservators, of advancing evolution."

Insects shaped by the needs of flowers: C. V. Riley, Rep. Amer. Soc. Adv. Sci.; Nature, vi. p. 444.

Insects as food: 3 species of Grasshoppers, larvæ of *Euphaga florifera*, H.-S. (*Lep.*), and of a Melolonthid beetle, and pupæ of *Borocera cajani*, Vinson (*Lep.*), are eaten by natives of Madagascar. Aug. Vinson, 'Voyage à Madagascar au couronnement de Radama II.' Paris: 1865, roy. 8vo, p. 309.

For correspondence &c. relative to proposed school of insect-economy, *cf.* SB. z.-b. Wien, xxii. p. 60 *et seq.*

by Saunders; and the plum, pp. 22–26, the potato, pp. 65–81, and the cucumber &c., pp. 89–92, by Reed. The species usually attacking these plants in America are discussed in a practical manner; but no original observations worth recording appear to be contained in the work, which is copiously illustrated by the usual (borrowed) woodcuts.

"Troudy [?= Travaux: ='Les Annales russes de la Société': vols. v. & vi. and livr. i. of vol. vii. had been published in 1872] de la Société entomologique de Russie, à St. Pétersbourg, vol. iv. 1867–69." In Hor. Ent. Ross. viii. Rev. Bibliogr. p. vii, is a notice of the above publication, originally printed in Russian. It contains the following articles:—A general description of the larvæ of *Coleoptera*, by C. de Gernet. A paper on the geographical distribution of species of *Coleoptera* peculiar to the north of Russia, by T. Köppen. Description and figs. of *Cecidomyia brachyptera*, with notes on its ravages in pine forests, by Gernet. General considerations on the relations of insects and man, by the same author. Descriptions and figs. of new varieties of *Melitæa maturna*, *Argynnis arsilache*, *Hadena amica*, and *Cidaria dilutata*, from St. Petersburg. Instructions for "sugaring," by A. Hüber. Notes on *Lepidoptera* found at a locality north of St. Petersburg, by Feild. A complete catalogue of Russian *Lepidoptera*, by N. Erschoff & Feild, of geographical importance. Instructions for collecting, by Solsky. A catalogue of Eversmann's *Lepidoptera*. The 'Bulletin' for 1866 and 1867 contains short communications on the larvæ of *Telephorus*, which appear in winter on the snow.

Linnæus. C. A. Dohrn, S. E. Z. xxxiii. pp. 446–462, continues his biographical notes: 1738–1763.

Rambur: Bibliographical notice by Mabille, Ann. Soc. Ent. Fr. (5) ii. pp. 307–312.

Brullé: a list of his entomological works by Desmarest, *ibid.* p. 513.

Wesmael. Sauveur (Ann. Ent. Belg. xv. pp. 213–233) publishes some posthumous reports of this author of interest for the Belgian fauna.

COLEOPTERA

By E. C. Rye.

Abeille de Perrin, Elzéar. Etudes sur les Coléoptères cavernicoles, suivies de la Description de 27 Coléoptères nouveaux français. Marseille: April, 1872, 8vo, pp. 41.

The new species are described by Abeille, Saulcy, and Pandellé. Pp. 5–12 contain notes on the cave insects of Ariége, being an account of expeditions to the caverns, with observations on the species; pp. 13–17, descriptions of new species; pp. 17–23, a synopsis of Pyrenean *Adelops*, including spp. nn.; pp. 24–26, a table of French spp. of *Anophthalmus*; pp. 27–41, descriptions of new French *Coleoptera*. The contents of pp. 1–26 are analyzed and the diagnoses of the new species reproduced in Bull. (2, reporting sitting of 13 March) Soc. Ent. Fr. (5) ii. pp. xviii–xxii, where that portion is

referred to as "aujourd'hui publié;" and the whole work is similarly treated *ibid.* pp. xli–xliv (Bull. reporting sitting of 8 May), as from "une épreuve d'une notice" that the author "vient de publier."

BARGAGLI, P. Materiali per la Fauna Entomologica dell' Isola di Sardegna. Coleotteri. Bull. Ent. Ital. iv. pp. 97–104, 279–290.

Nitidulidæ to *Elateridæ*.

BERTOLINI, STEFANO DE. Catalogo sinonimico e topografico dei Coleotteri d'Italia. Firenze: 1872, pp. 44.

Published with Bull. Ent. Ital. iv. The present portion reaches to the end of the *Philhydrida*.

FAUVEL, ALBERT. Catalogue des Coléoptères de la Nouvelle Calédonie et dépendances, avec descriptions, notes, et synonymies nouvelles. Bull. Soc. L. Norm. (2) i. pp. 172–209, pl. 1.

This paper, an extension of one on the same subject by the author, *l. c.* vii., has hitherto escaped record in the present work, apparently from the confusion of dates attending its medium of publication. 434 species are enumerated.

——. 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. Coléoptères, iii. (3e livraison). Caen: "Mai, 1872," pp. 214, 2 pls.

This portion (reviewed Nouv. et faits, p. cxli, and, as regards British species, by the Recorder in Ent. Ann. 1873, p. 14 *et seq.*) exclusively refers to the *Staphylinidæ*, commencing with the groups usually placed at the end of that family, and reaching only to *Oxyporus*. Some new species are described in it. The livraison, the third of the whole work, is stated to commence an irregularly issued third volume (which apparently will be bulky); the 2 livraisons before published form the 1st vol.; and the families of the omitted 2nd vol. (*Cicindelidæ* to *Hydrophilidæ*) "paraîtront ensuite." Both the above parts were originally issued in Bull. Soc. L. Norm. (2), as follows:—Introductory portion, including terminology, forming chapters i.–iii. in vol. ii. 'Année, 1867,' bearing 1868 at bottom of title, pp. 175–379, pls. i–iv.; completion of the introduction, chapters iv.–vi. in vol. iii., 'Année, 1868,' bearing 1869 at bottom of title, pp. 26–113; *Staphylinidæ*, reaching to *Oxytelus insecatus*, in vol. v., 'Année, 1869-70,' 1870 at bottom of title, 1871 on outer wrapper [but, as the Recorder believes, not actually published until 1872], pp. 27–192. In this last-mentioned vol., in the account of the proceedings at the meeting of the Society of 8 Nov., 1869, are (pp. 17–21) descriptions of a new genus and some new species, for which, in the livraison now under notice (itself a part of the identical volume), priority is claimed as from the last-mentioned date, and not from the actual date of publication, the author apparently considering that the act of reading a paper privately to the members of his society is a publication to the world. The

Bulletin should be published *annually* *, according to Art. 20 of the Society's Rules: *cf.* Bull. Soc. L. Norm. (2) iv. p. 12.

Gemminger, Max, & Harold, E. von. Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus. ix. pt. i. Munich: 1872, 8vo, pp. 2669–2750.

Comprises the *Scolytidæ*, *Brenthidæ*, and *Anthribidæ*. For alterations and additions to vol. ii. by G. R. Crotch and v. Harold, *cf.* C. H. x. pp. 204–207; and for remarks on *Carabidæ* by Chaudoir, *cf.* Bull. Mosc. xliv. 2, p. 279 *et seq.*

Hochhuth, Johann Heinrich. Enumeration der in den russischen Gouvernements Kiew und Volhynien bisher aufgefundenen Käfer. Art. ii. Bull. Mosc. xliv. 2, pp. 85–117; iii. (posthumous) *ibid.* xlv. 2, pp. 195–234, 283–322.

Continues the list mentioned in Zool. Rec. viii. p. 223, discussing from the *Staphylinidæ* to the *Lucanidæ* inclusively. Some new species are described. In the report of the meeting of 19 Oct., 1872 (p. 34), is a notice of the existence of the deceased author's MS. of the *Scarabæidæ* and *Buprestidæ*, prepared for the continuation of this work, and which are proposed to be completed and published by J. K. Maschel.

Letzner, K. Verzeichniss der Käfer Schlesiens. Breslau: 1871, pp. 328.

MacLeay, William. Notes on a Collection of Insects from Gayndah: 2nd paper. Tr. Ent. Soc. N. S. W. ii. pt. iv. (1872) pp. 239–318.

Includes from the *Buprestidæ* to the *Œdemeridæ* inclusively. The whole work discusses 702 species. The author gives a list of his new genera and species [70 named "*mastersii*"!], pp. 314–318, and states his intention of not continuing the work for the present.

Marseul, S. A. de. Répertoire des Coléoptères d'Europe décrits isolément depuis 1864. L'Ab. viii. (ii. 2nd sér.) pp. 165–412.

Completes the 1st part, to the end of the *Staphylinidæ*, of which family the synonymy and observations are attributed to Fauvel.

Masters, George. Catalogue of the described Coleoptera of Australia. Sydney: 1872, pt. ii. pp. 65–128 (Pselaphidæ—Buprestidæ); pt. iii. pp. 129–192 (Buprestidæ—Tenebrionidæ); pt. iv. pp. iv, 193–246 (Tenebrionidæ—Curculionidæ).

Motschoulsky, Victor. Énumération des nouvelles espèces de Coléoptères rapportés de ses voyages (11ième article). Bull. Mosc. xlv. 2, pp. 22–55.

"Tenebrionides" to "Sténelytres." The deceased author's accustomed ambiguity predominates in this paper, which contradicts its title by discussing

* "Simple question à M. Fauvel:—La Société Linnéenne de Caen ne publie-t-elle pas de *Bulletin* depuis deux ans?" S. A. de Marseul, Nouv. et Faits (3), ii. p. 6.

other than new species. The accustomed indications of novelty are but seldom given, though, from the unusual length and detail of some descriptions, there can be no doubt that certain species not absolutely referred to as new are really intended to be published as such. Several others, and some genera mentioned, may also be intended to be published as new.

PICCIOLI, FERDINANDO. Catalogo sinonimico e topografico dei Coleotteri della Toscana. Bull. Ent. Ital. iv. pp. 259–272.

In this fourth year of its continuation, this list (compiled with the help of Bargagli) reaches to the end of the *Carabidæ*.

REICHE, L. Catalogue des Coléoptères de L'Algérie et contrées voisines, avec description d'espèces nouvelles: pp. 44. Extracted from Mém. Soc. L. Norm. (2) xv. (bearing date 1869): published in 1872.

This part comprises from the *Cicindelidæ* to the *Staphylinidæ* inclusively. Several species, which must of course be considered as dating from 1872, are described (by Reiche, Pandellé, and Fauvel) in the notes; and some changes of nomenclature are proposed; for comments on which, and a general review of the work, see C. H. x. p. 230, and Nouv. et Faits, p. cxxxiii (July, 1872). The author acknowledges the assistance of MM. Lallemant and Fauvel; the portion relating to the *Brachelytra* being apparently entirely attributable to the latter.

SEIDLITZ, GEORG. Fauna Baltica. Die Käfer (Coleoptera) der Ostseeprovinzen Russlands. Dorpat: 1872, 8vo: Lieferung 1, table of families, pp. 1–24 (table of genera), pp. 1–128; Lief. ii. p. i–xx (introductory chapter on external anatomy, collecting, &c.), pp. 25–48 (table of genera), pp. 129–208, one plate.

Reviewed by v. Harold in C. H. x., by Kiesenwetter & Kraatz, B. E. Z. xvi. pp. 239 & 240, and by J. Faust, Hor. Ent. Ross. viii., Rev. Bibl. p. x.

The work is on the same dichotomous scheme as Redtenbacher's well-known 'Fauna Austriaca,' rendered more difficult to follow by the copious use of abbreviations and symbols. Species likely to occur in the district are described, in different type. The following is the list (in order) of families employed and now discussed by the author:—(Leif. i.) Carabicidæ [*sic*], Dytiscidæ, Gyrinidæ, Palpicornia, Heteroceridæ, Parnidæ, Georyssidæ, Lucanidæ, Scarabæidæ, Buprestidæ, Eucnemidæ, Elateridæ, Dermestidæ, Byrrhidæ, (Lief. ii.) Histeridæ, Micropeplidæ, Nitidulidæ, Peltidæ, Byturidæ, Mycetophagidæ, Phalacridæ, Rhysodidæ, Cucujidæ (including *Hypocoprus* and *Lyctus*), Colydiidæ (including *Monotoma*, *Lathridius*, *Corticaria*, *Symbiotes*, *Mycetæa*, *Alexia*, *Leiestes*, *Myrmecoxenus*, and *Murmidius*, from which *Certhocerus advena* is supposed to be distinct, &c.), Cryptophagidæ (including *Aspidophorus*, *Engis*, and *Sphindus*), Cissidæ, Telmatophilidæ (consisting of *Diphyllus*, *Diplocœlus*, *Psammœchus*, and *Telmatophilus*), Erotylidæ, Endomychidæ, Coccinellidæ, Corylophidæ, Trichopterygidæ, Scaphidiidæ, Sphæriidæ, Clambidæ, Anisotomidæ. From the table, it is evident that the work will be continued thus:—Silphidæ, Scydmænidæ, Paussidæ, Pselaphidæ, Staphylinidæ, Malacodermata, and Tere-

dilia (with 7 families). It is not within the province of the present Record to discuss the various heresies above promulgated.

In the introductory chapter, the strong bilateral symmetry of the Arthropoda, noticed as their chief characteristic, and named "Eudipleuren-Form," is stated to be possessed by them in common with locomotives, boats, and other machines. The free prothorax of beetles is emphasized in the definition of the order; and the whole scutellum is said to be only visible in the apterous females of a few species. The plate consists of outlines of various parts of the external anatomy of *Dytiscus*, *Cicindela*, and *Hister*.

SHARP, D. The Coleoptera of Scotland. Scot. Nat. i. pp. 202–208, 242–248, 277–280.

A list, with localities. The present portion reaches to *Pogonus*.

SOLSKY, S. Matériaux pour l'Entomologie de la Russie. Hor. Ent. Ross. viii. pp. 177–186.

Localities, descriptions of new species, synonymic notes, &c.: *Cicindelidæ* to *Ptinidæ*.

——. Coléoptères de la Sibérie Orientale. *L. c.* pp. 232–277.

Completes the paper noticed in Zool. Rec. vii. p. 250; some additional species from Lake Baikal are incorporated.

THOMSON, CARL GUSTAF. Entomologiska Anteckningar under en resa i Skåne, 1866. Œfv. Ak. Förh. xxiv. (1867), no. 2, pp. 39–52.

The species and genus originally here described as new (*Microsaurus fageti*, p. 43, *M. puncticollis*, p. 43, *Autalia puncticollis*, *Gyrophæna bihamata*, *Ityocara*, p. 46, *Pycnaræa nigripes*, *Liogluta aquatilis*, p. 47, *Hister arenicola*, p. 50, *Bagous muticus*, p. 51) were quoted in Zool. Rec. iv. as from the 'Skandinaviens Coleoptera,' vol. ix., of the same author, and this paper appears to have escaped observation. It consists of an account of the known species captured during the expedition, as well as those above mentioned.

GEOGRAPHICAL DISTRIBUTION. Great Britain: The Recorder has given his annual summary of new British species &c., in Ent. Ann. 1873, pp. 1–33.

Northumberland: T. J. Bold, Tr. North. Durh. iv. pp. 371–380, gives localities &c. for species new to the local fauna.

Belgium: additions &c. to catalogue of species in CR. Ent. Belg. xv. pp. vi, vii, xxv, xxx, liii (supplement by Lethierry), lix, ciii.

Jumiéges: Levoiturier & Mocquerys (CR. Soc. Rouen, vi. & vii.; also sep., Rouen, 8vo) publish a list of species taken during an excursion of the Society in June 1870. Mocquerys, *ibid.*, gives a supplement to the list of species found in the department of the Seine-Inférieure, and a list of species taken at La Bouille in June 1871.

Marseilles: exceptional scarcity of species noticed by Abeille de Perrin, Pet. Nouv. no. 59, p. 236.

Canterbury, New Zealand: remarks on *Coleoptera* by C. M. Wakefield, Tr. N. Z. Inst. v. (1872), pp. 294–304.

Labrador: A. S. Packard gives a list of species, iv. Rep. Peab. Ac. pp. 92–94 (to commencement of *Staphylinidæ*).

Grimsby, Ontario: J. Pettitt concludes his list. Canad. Ent. iv. pp. 12 & 98.

E. Colorado and N.E. New Mexico: in F. V. Hayden's Geological Survey of Wyoming (1871) is a list of species collected by Cyrus Thomas during the survey of 1869.

Montana. In the same geologist's 'Preliminary Report of the United States Geological Survey of Montana and portions of adjacent territories' (Washington: 1872, pp. 538, pls. 2), pt. iv. pp. 382–392, is a list by Horn of the species found by C. Thomas during this survey, in June and July 1871, the space explored being intermediate between the faunal regions of Oregon and the plains to the east of the Rocky Mountains. In *Eleodes* (especially *E. obscura*, Say), *Calosoma luxatum*, *Omus*, &c., the sculpture is deeper and rougher towards the west. Oregon forms (e. g. *Tragosoma harrisi* and *Phryganophilus collaris*) extend southward to California, gradually seeking a higher mountain-habitat as the region becomes warmer. From S. California, species have extended along the desert bordering the River Colorado to Utah, but cannot be expected to cross the Rocky Mountains. New *Meloidæ* occur in every fresh region. Modifications of species by extended habitat are also discussed by de la Brûlerie, R. Z. (2) xxiii. pp. 173 & 221, especially with regard to *Carabidæ*.

Madagascar. In Vinson's 'Voyage' &c. Annexe C, pp. 1–18, is a list by Ch. Coquerel of nearly 900 known species, in which 22 of Lacordaire's families (including the *Nitidulidæ*!) are not represented.

Cave-beetles. Piochard de la Brûlerie, Ann. Soc. Ent. Fr. (5) ii. pp. 443–472, under the title "Notes pour servir a l'étude des Coléoptères cavernicoles," describes various new species, of which mention will be made hereafter. Eyeless insects seem nevertheless capable of being affected by light; but the means supplying the want of sight are not capable of explanation. Most blind beetles have all the limbs much elongated. In *Adelops* and *Anophthalmus*, compared with *Catops* and *Trochus*, the author considers that the greater diversification of form and more considerable number of species of the two blind genera may be due to the more trenchant differences in the conditions of life of the cave-dwellers than of those free to occupy various points of the surface, and to their absolute isolation [see also Abeille, *suprà*, p. 230].

Ants'-nest beetles at Baikal are of the same species as those commonly found in Europe. Solsky, Hor. Ent. Ross. viii. p. 236, note.

Captures of rare or local species are recorded from the Manchester district by W. Broadhurst, Ent. M. M. viii. p. 289; from the New Forest, by G. C. Champion, *ibid.* ix. p. 86; from Caterham, *id. ibid.* p. 159; from Kent, by H. S. Gorham, *ibid.* pp. 12 & 118; from S. Devon, by T. V. Wollaston, *ibid.* p. 33; from North Brabant, by Everts, Tijdschr. Ent. (2) vii. p. xxvi; from Luxemburg, by v. Volxem, CR. Ent. Belg. xv. p. lxvii; from Flemish Zeland, by Weyers, *ibid.* pp. lix & lxvii; from St. Vaast-la-Hougue, by A. Fauvel, Bull. Soc. L. Norm. (2) v. p. 402; from Finisterre, by Vérez, Hervé, & Oberthur, Pet. Nouv. no. 60, p. 240; from Fontainebleau, by Grouvelle & Léveillé, *ibid.* no. 59, p. 236; from Central France, by Desbrochers, Bull. Soc. Ent. Fr. (5) ii. p. lxxxiv; from the Valley of Lantosque, Alpes Maritimes, by Peragallo, Pet. Nouv. no. 65, p. 259; from the Caves of Ariége, by de la Brûlerie, *ibid.* no. 66, p. 263, and (also from Switzerland) Abeille de Perrin,

Nouv. et Faits, p. cix; from Mont Cenis, by Donzel, Pet. Nouv. no. 60, p. 241; from Turin, by Baudi, Bull. Ent. Ital. iv. p. 367; from Trieste, by Bertolini, *ibid.* p. 371; from the Valle di Sole, Trentino, *id. ibid.* pp. 109–118; from Silesia, by E. Schwartz, B. E. Z. xvi. pp. 153–156; from Berlin and Sommerfeld by J. Weise, *ibid.* pp. 157–159; from Liegnitz, by Gerhardt, *ibid.* p. 166; from Königsberg, by G. Czwalina, *ibid.* p. 161; from Hamburg, by W. Koltze, *ibid.*, and H. Beuthin, *ibid.* p. 162; from Syria, by Auzoux, Nouv. et Faits, pp. cvi, cx, cxiii, cxix, cxxvii; and from Buenos Aires, by Burmeister, S. E. Z. xxxiii. p. 227.

On leaf-mining *Coleoptera* in Canada: Chambers, Canad. Ent. iv. p. 123.

On *Coleoptera* in birds' nests: E. C. Rye, Ent. Ann. 1873, p. 7. In flood-refuse: G. C. Champion, Ent. M. M. viii. p. 270.

Instances of sudden and unaccountable disappearance of species (e. g. *Gonioctena pallida*, *Orsodacna cerasi*, and *Agathidium varians*) from localities where they were formerly abundant are recorded by E. A. Waterhouse, Ent. M. M. viii. p. 205.

Bethune (Canad. Ent. iv. pp. 31, 52, 93, 111, 151, 175, 196, 231) continues his reproductions of the descriptions of species from Kirby's 'Fauna Boreali-Americana,' with synonymic and other notes (*Buprestidæ* to *Halticidæ*).

Diagnoses of new species from Italy described in various recent publications are compiled by Piccioli & Bargagli, Bull. Ent. Ital. iv. pp. 305–315.

Parts i.–v. of a 3rd edition of Redtenbacher's "Fauna Austriaca. Die Käfer" (*Cicindelidæ—Dascillidæ*) have been published in 1871 and 1872. Vienna: 8vo.

The Rev. J. G. Wood has published a small introductory treatise on Common British Beetles, pp. 140, pls. 12, in outline, and woodcuts, giving a general view of the type species. These are treated in a popular and untrustworthy manner.

The characters of the underside &c. used by Thomson are pointed out by Bedel, Ann. Soc. Ent. Fr. (5) ii. p. 396, and by Ch. Brisout, *ibid.* Bull. p. xxiii *et seq.*

On collecting and preserving beetles, *cf.* Rye, Sc. Goss. no. 91, pp. 145–151.

Cicindelidæ.

Oxygonia. H. W. Bates, Ent. M. M. viii. p. 237, refers to the affinities of this genus, the members of which seem to occur on mossy stones in the beds of cold rapid streams (at Ecuador). The bispinose apices of the femora appear not to be constant; the acuminate apex of the elytra is only found in the ♂ of some species; and the labrum seems only to have one central tooth. Other characters are briefly stated, and 12 species are noticed, fresh localities &c. being given for *O. schœnherri*, Mann., *prodiga*, Er., *vuillefroyi*, Chaud., *dentipennis*, Germ., and *albitœnia* and *cyanopis*, Bates.

Phyllodroma delia, Thoms., is an *Oxygonia*, possibly *O. prodiga*, Er.: *id. l. c.* p. 287.

Cicindela compressicornis, Boh., is probably a *Bostrichophorus*, Chaud., of which the peculiar characters are possibly sexual: *id. ibid.*

Cicindela. 16 Italian species described, with synonyms, by O. Pirazzoli, Bull. Ent. Ital. iv. pp. 3–28. *C. hybrida* is the commonest.

C. dahurica, Chaud., *ex. typ.*, = *gracilis*, Pall., var.; *C. decipiens*, Steven, MS. is probably a good species: Des Cottes, Pet. Nouv. no. 56, p. 223. *C. dunetorum*, Fald., = *desertorum*, Dej., var. *certe*: Gilnicki, R. Z. (2) xxiii. p. 468.

Pentacomia, g. n., H. W. Bates, *l. c.* p. 265. Allied to *Odontochila*, but with ungrooved tarsi to all legs and in both sexes, and densely pubescent soles to all joints of front tarsi in ♂. *P. chrysamma*, sp. n., *id. l. c.* p. 266, Ecuador.

Oxychila nigroænea (and var. *variipes*) and *gracillima*, Ecuador, p. 263, *chestertoni*, New Granada, and *polita*, Nicaragua, p. 264: *id. l. c.*, spp. nn.

Oxygonia gloriola, p. 240, *floridula* and *buckleyi*, p. 241, *moronensis*, *carissima*, and *annulipes*, p. 242, Ecuador: *id. l. c.*, spp. nn.

Cicindela hispidula, p. 264, S. Brazil, *chalceola*, N. Peru, and *microtheres*, Ecuador, p. 265, *id. l. c.* viii., *ditissima*, Hong Kong, p. 49, *velata*, N. Borneo, p. 50, *id. l. c.* ix.; *C. lagunensis*, des Cottes, *l. c.* p. 223, Castille: spp. nn.

Odontochila vermiculata, Ecuador, *iodopleura*, Nicaragua: H. W. Bates, *l. c.* viii. p. 285, spp. nn.

Therates caligatus, p. 285, *bellulus*, p. 286, Philippines: *id. l. c.*, spp. nn.

Dromica (*Myrmecoptera*) *polyhirmoides*, p. 286, *mauchi*, p. 287, S.E. Africa: *id. l. c.*, spp. nn.

Ctenostoma eburatum, sp. n., *id. l. c.* ix. p. 49, S. Brazil.

Carabidæ.

Chaudoir, Bull. Mosc. xliv. 2, p. 279 *et seq.*, publishes various corrections of errors &c. in Gemminger & von Harold's 'Catalogus' (some, apparently, mere guesses). Many genera are considered to be of uncertain position; *Actenonyx*, White, is near *Scopodes* (with which *Periblepusa*, Redt., is identical); *A. vittata* is a *Xanthophæa*; *Promecoptera*, Dej., = *Anchomenus*; *Nematotarsus*, Lec., *Lirodira*, Cast., and *Cyclosomus*, Dej., belong to the *Tetragonoderides*; *Perigona*, Cast., has nothing to do with *Somoplatus*; *Graniger*, Mots., = *Coccinia*, *G. algirinus* = *C. semelederi*; *Dregus*, Mots., = *Pangus*, *D. nitidus* = *Harpalus glebalis*, Coquerel; *Hæmatochares*, Thoms., = *Stereostoma*; *Melisodera* is one of the *Morionides*; *Abacodes*, Thoms., = *Buderes*; *Geta*, Putz., = *Homalomorpha*, which is referred to the *Morionides*, *Gnathoxys*, Westw., to the *Broscides*, *Stomonaxus*, Mots., to the *Drimostomides*, *Copterus*, Guér., to the *Trechides*, *Eucærus*, Lec., to the *Lachnophorides*, *Dirotus*, M'L., *Amblytelus*, Er., *Olisares*, Mots., *Ctenognathus*, Fairm., *Habropus*, Waterh., to the *Colpodides*; *Systenognathus*, Putz., and *Batoscelis*, Lac., = *Pachytrachelus*; *Trichisia*, Mots., = *Eudema*; *Callistoides*, Mots., = *Chlænius*; *Stomatocolus*, M'L., = *Dichrochile*, Cast.; *Tetraodes*, Blanch., = *Cardiophthalmus*, Putz.; *Phymatocephalus*, Schaum, and *Cratocara*, Lec., = *Polpochila*, which is one of the *Harpalides* (*P. parallela* = *Melanotus chilensis*, Chaud.); *Pachauchenius*, M'L., = *Phorticosomus*; *Actena*, Dej., = *Actenoncus*; *Geobæmus*, Dej., *Metius*, Curt., = *Antarctia*; *Sagrameros*, Redt., = *Hypharpax*; *Cylloscelis*, Curt., = *Paramecus*; *Megaristerus*, Nietn., = *Hispalis*; *Dyschromus*, Chaud., = *Euchroa*: *Trigonognatha*, Mots., = *Triplogenius*; *Sphenopalpus*, Blanch., belongs to the *Cymindides*, *Lophidius*, Dej., to the *Masoreides*, and *Nemoglossa*, Sol., to the

Anisodactylides; *Platycœlus*, Blanch., = *Feronia*; *Tibarizus*, Cast., and *Pachidius*, Chaud., = *Cratogaster*; *Pristosia*, Mots., = *Calathus*; *Metallosomus*, Mots., = *Colpodes*.

Bedel, Ann. Soc. Ent. Fr. (5) ii. p. 369 *et seq.*, refers to the novel characters pointed out by Thomson in studying genera and species, adding observations on the importance of the pubescence and form of the limbs.

Gilnicki, R. Z. (2) xxiii. pp. 466–480, pl. iv., gives a catalogue of the species found by T. Deyrolle in Asia Minor.

Elaphrides.

Elaphrus sibiricus, Mots.: characters pointed out; *E. dauricus* (Mann.), A. Moraw., is apparently identical with it, and it is suggested to be a local race of *E. cupreus*. Solsky, Hor. Ent. Ross. viii. p. 232.

Carabides.

Nebria complanata: larva described by Lallemant, in Reiche's Cat. Col. Alg. p. 2, note. That of *N. andalusiaca*, Ramb., briefly noted: *id. ibid.*

Procerus colchicus, Mots., ? = *scabrosus*, var.; *Carabus bonvouloiri*, Chaud., ♂ described, pl. iv. fig. 4; *C. ponticus*, E. Deyr., redescribed, pl. iv. fig. 1, *C. gilnickii*, E. Deyr., pl. iii. fig. 3, redescribed, and objections made to Chaudoir's opinion that it is a var. of *C. scowitzii*; *C. theophilii*, E. Deyr., pl. iii. fig. 2, redescribed; a var. of *C. cribratus*, Quens., from Trebizond, pl. iv. fig. 2; *C. robustus*, E. Deyr., redescribed, pl. iii. fig. 1: Gilnicki, R. Z. (2) xxiii. p. 468 *et seq.*

Carabus withii, Deyr., *ex. typ.*, = *lineatus*, Dej., ♀ var., *teste* Sharp: Perez Arcas, Act. Soc. Esp. i. p. 7. *C. lineatus* is certainly distinct from *splendens*: de la Brûlerie, R. Z. (2) xxiii. p. 224, and Pet. Nouv. no. 45, p. 179. Kraatz especially notes the record by Seidlitz (Fauna Balt. p. 7) of *C. splendens* at Polloper, 35 versts from Dorpat: B. E. Z. xvi. p. 240. Faust, Hor. Ent. Ross. viii. Rev. Bibl. p. xi, considers this capture purely accidental.

Reduplication of right intermediate leg in *C. splendens*, and of left antenna of *C. monilis*, recorded by Lartigue, Bull. Soc. Ent. Fr. (5) ii. p. lxi.

Of about 50 species inhabiting Eastern Siberia, only one (*C. granulatus*) is found also in Western Europe; though several have parallel forms: H. W. Bates, P. E. Soc. 1872, p. viii. Spanish species are mostly confined to the Iberian peninsula: D. Sharp, *ibid.*

Coptolabrus pustulifer, Luc.: ♂ & ♀ from Moupin, Thibet, redescribed by the author, Ann. Soc. Ent. Fr. (5) ii. p. 293; ♂ figured, pl. xiv. fig. 12.

Calosoma sycophanta found in quantity on putrefying human corpse near Rheims: Follias, Pet. Nouv. no. 53, p. 212.

C. inquisitor found on broom, and *Carabus intricatus* on sloe: Joube, Pet. Nouv. no. 55, p. 220.

Nebria mandibularis, p. 51, N. Persia?, *chinensis*, p. 52, China: H. W. Bates, Ent. M. M. ix., spp. nn.

Leistus angulatus, sp. n., La Brûlerie, Pet. Nouv. no. 45, p. 179, Spain.

Carabus riffensis, Fairmaire, R. Z. (2) xxiii. p. 60, Morocco (Feb. 1872); *C. elephas* (? = *riffensis*, Fairm.; *cf.* Pet. Nouv. no 51, p. 205) and *olcesii*, p. lii, Riff, *auriculatus*, Asturias: Putzeys, CR. Ent. Belg. xv.: spp. nn.

Cychrides.

Damaster lewisi, sp. n., Rye, Ent. M. M. ix. p. 131, Nipon and Kiushiu, Japan.

Cychrus costæ, sp. n., Emery, Bull. Ent. Ital. iv. p. 166, pl. 2. fig. 1, Naples.

Odontacanthides.

Homethes, Newm.: Chaudoir, Bull. Mosc. xlv. 1, p. 387 (adopting Gemm. & v. Harold's correction of *Homothes*), removes this genus from the neighbourhood of *Cymindis* to that of *Stenochila*, on account of the outer lobe of its internally ciliated maxillæ being non-articulate, its palpi, mandibles, and tarsi slender, the structure of its ligula, &c.

Casnonia hæmorrhoidalis, Mots., is described from Tranquebar examples of *fuscipennis*, Chaud., and is apparently a good species; *Od[ont]acantha litura*, Schm.-G., is a *Casnonia*; *C. picta*, var. n. *suturalis*, United States, p. 405; *C. clarencii*, Cast., = *australis*, Chaud., = *aliena*, Pasc., and forms a separate section; *C. obscura*, Cast., and *O. micans*, Macl., are probably identical; *C. incerta*, Chaud.,=*geniculata*, Gory; *Apiodera longicollis*, Mots.,=*C. brevipennis*, Chaud.; *C. marginestriata*, Putz., redescribed; *Lachnothorax*, Mots., is only a section of the genus: *id. l. c.* p. 404 *et seq.*

Stenidia, characterized by its ligula: *id. l. c.* p. 409.

Homothes emarginatus, sp. n., *id. l. c.* p. 389, Melbourne.

Casnonia ænescens, p. 398, Cantagallo, *umbrigera*, ibid., *liodiscus*, *lignata*, p. 399, Rio Janeiro, *rudis*, Ega, *punctatostriata*, Cayenne, p. 400, *santarema*, p. 401, Santarem, *bivittis*, p. 402, Mexico, *virgulifera*, p. 403, Siam, *latifascia*, p. 404, East Indies: *id. l. c.*, spp. nn.

Od[ont]acantha fulvipennis, p. 407, Celebes, *apicalis*, p. 408, Bangkok, Singapore: *id. l. c.*, spp. nn.

Stenidia quadricollis, sp. n., *id. l. c.* p. 410, Lake N'gami.

Anchonoderides.

Callistus. Chaudoir, *l. c.* p. 384, defends his former opinion that this genus and its allies approach *Anchonoderus* more than *Chlænius*. If separated from the present group, *Callistus*, *Callistomimus* (infrà), and *Callistochrous*, Chaud. (type *Tetragonoderus baxi*, Gory, from Senegal), should form a fresh one, under the name *Callistides*. *Callistochrous* (Bull. Mosc. 1850) is practically recharacterized (pp. 385 & 386), and stated to form a transition to *Camptotoma*, Reiche, also recharacterized, which may also form a transitional group between the proposed *Callistides* and the *Lachnophorides*.

Ega. Striation of elytra the best diagnostic character. *E. brasiliensis*, Mots., ?=*longiceps*, Schaum. The known species are briefly referred to,—*amazonica* (p. 394), from Ega, and *sulcipennis* (*ibid.*) and *obliqua* (p. 395), from Rio Janeiro, being named (not described) as new. *E.? angusticollis*, Montrouz., is a Bembidiid, near *Tachys*. *Steleodera* (*Selina*, Mots.) *westermanni* is generically quite distinct from *Ega*. *Id. l. c.* p. 392 *et seq.*

Chalybe. *C. leprieuri*, Cast., occurs in the Amazon district, and *C. basalis*, H. W. Bates, is queried as a var. of it; *C. inæqualis*, Bates, is doubted as identical with Brullé's species of that name (*grata*, Mots., *puncticollis*, Laf.): *id. l. c.* p. 396.

Callistomimus, g. n., Chaudoir, *l. c.* p. 382. Facies of *Callistus lunatus*, but with no tooth in the emargination of the mentum, more slender, pointed, and pubescent palpi, and the dilated joints of the tarsi in the ♂ not so wide. *Callistus amabilis*, Redt.,=*modestus*, Schaum, *coarctatus*, Laf.,=*littoralis*, Mots.,=*westwoodi*, Schaum, 4-*pustulatus*, Gory, 5-*maculatus*, Laf., *elegans*, *caffer*, and 6-*pustulatus*, Boh., and *C. guttatus*, sp. n., *id. l. c.* p. 383, Natal.

Ctenodactylides.

Amblycoleus, g. n., Chaudoir, *l. c.* p. 410. Facies of *Trigonodactyla*; differs from *Leptotrachelus* in its more enlarged tarsi, with the lobes of the 4th joint less slender, stout, and ovate, its very obtusely rounded elytral apex, and flatter surface. *Leptotrachelus platyderus*, Chaud., and *A. doucei*, sp. n., *id. l. c.* p. 411, Cayenne.

Leptotrachelus nigriceps, p. 412, Para, *pallidipennis*, ibid., *punctaticeps*, p. 413, Ega, *debilis*, *striatopunctatus*, p. 413, Rio Janeiro: *id. l. c.*, spp. nn.

Galeritides.

Dendrocellus rugicollis, Chaud.,=*flavipes*, Schm.-G., omitted by Gemm. and v. Harold, and is also *nepalensis*, Hope Coll. (? described); *D. geniculatus* occurs at Malacca. *Galerita mexicana* is distinct from *atripes*, Lec. *Zuphium rufifrons*, Chaud.,=*pubescens*, Nietn., *Z. vittigerum*, Schm.-G.,=*bimaculatum*, S.-G.; *Diaphorus* is divided into subgenera, *D.* proper, and *Thalpius* (*Enaphorus*), Lec.: Chaudoir, R. Z. (2) xxiii. p. 139 *et seq.*

Drypta. The perfect insect can live for some time under water, readily submerging itself when pursued. Lallemant, in Reiche's Cat. Col. Alg. p. 3, note.

Zuphium chevrolati, Lap.: habits noted; *id. l. c.* p. 4, note.

Dicrodontus, g. n., Chaudoir, R. Z. (2) xxiii. p. 139. Emargination of mentum distinctly bifid; elytra almost as in *Aptinus*. *Polystichus brunneus*, Dej. (*unicolor*, Brullé).

Calophæna bonvouloiri, sp. n., Chaudoir, *l. c.* p. 101, French Guiana.

Dendrocellus parallelus, id. *ibid.*, Sumatra, *ternatensis*, id. *l. c.* p. 102, Ternate, spp. nn.

Drypta mouhoti, sp. n., *id. l. c.* p. 102, Laos.

Zuphium brasiliense, p. 103, St. Catherines, Brazil, *columbianum*, New Granada, *siamense*, Siam, p. 104: *id. l. c.*, spp. nn.

Diaphorus intermedius, New Granada, *granulosus*, Brazil, p. 105, *tenuicornis*, p. 106, Mexico, *D.* (*Enaphorus*) *horni*, p. 107, California: *id. l. c.*, spp. nn.

Polystichus intermedius, sp. n., *id. l. c.* p. 138, no locality given.

Helluonides.

Planetes bimaculatus, Macl., and *ruficeps*, Schm. (*bimaculatus*, Nietn.), differential characters &c. given; *Polystichus australis*, W. Macl., is a *Planetes*, very close to *immaculatus*, Schm.; *Planetes stigma*, F., is erroneously so placed by Gemm. and v. H., being a *Strigia* (*Selenidia*, Mots., near *Orthogonius*); *Omphra brevis*, Chaud.,=*complanata*, Rche.; *Helluo rufipes*, Kl., is not a *Polystichus* but an *Omphra*; *Meladroma*, Mots., is briefly characterized (p. 172), and *Acanthogenius grandis*, Dej., *dispar*, Lac.,=*grandis*, Murray,=*opacus*, Laf., = *umbraculatus*, F. (*Anthia*), and *grandis*, Boh., = *lugubris*,

Schaum, referred to it; *A. bimaculatus*, Murr., *ex. typ.*, = *labrosus*, Dej.; *Planetes crucifer*, Redt., = *A. asteriscus*, White; *A.* (*Macrochilus*) 4-*maculatus*, Guér., is not identical with 3-*pustulatus*, Dej., but = *bensoni*, Hope; *Creagris*, Nietn., is generically different from *Acanthogenius*, and *labrosus*, Nietn., can then stand; *Erinnys*, Thoms., should be removed next *Polystichus* (*Galeritides*), and to it belong *Helluomorpha bellicosa*, Cast., = *Helluo heros*, Gory, and *Helluomorpha obscuricornis*, Chevr., = *chabrillaci*, Thoms., = *macroptera*, Chaud.; *Ænigma newmani*, Cast., = *iris*, ♀; *Helluo carinatus*, Chaud., is a good species; *Gigadema* is differentially compared with *Helluo*, and both sexes of five species noted, viz. *titana*, Thoms., = *longipennis*, Germ. (? = *noctis*, Newm., insufficiently characterized), *grandis*, Mcl., not the ♂ of *titana*, as Castelnau avers, *bostocki*, Cast., *castelnaui*, Chaud., and *minuta*, Cast., = (*Ænigma*) *unicolor*, Hope; *Helluodema*, Cast., requires division: Chaudoir, R. Z. (2) xxiii. p. 139 *et seq.*

Helluonidius, g. n., *id. l. c.* p. 216. Separated from *Helluodema* by its ovate and subobtusely rounded ligula, sharp but not very elongate tooth of the mentum, much longer labrum, which is obtusely toothed in the middle, and bilobed 4th joint of tarsi. *Ænigma cyanipenne*, Hope.

Dicranoglossus, g. n., *id. l. c.* p. 217. Also separated from *Helluodema*, chiefly by its bifurcate ligula. *Helluodema resplendens*, Cast.

Sinoglossus, g. n., *id. ibid.* Allied to *Helluodema*. Ligula slightly emarginate in the middle and elongated beneath &c. *S. niger*, sp. n., *id. ibid.* (no locality given).

Omphra rotundicollis, sp. n., *id. l. c.* p. 140, East Indies.

Helluomorpha squiresi, Rio Janeiro, *gagatina*, Cayenne, p. 141, *mexicana*, p. 143, Yucatan: *id. l. c.*, spp. nn.

Pleuracanthus luctuosus and *cribricollis*, spp. nn., *id. l. c.* p. 168, Brazil.

Acanthogenius anthioides, p. 169, Benguela (connects *Anthiides* and *Helluonides*), *A.* (*Macrochilus*) 3-*maculatus*, p. 171, Deccan: *id. l. c.*, spp. nn.

Brachinides.

Brachinus mutilatus, F., = *bombarda*, Ill., and *B. plagiatus*, Rche., is adopted for *bombarda*, Dej. (already published in C. H. iii. p. i): Reiche, Cat. Col. Alg. p. 4, note [Reiche uses *Brachynus* for the genus, *Brachinidæ* for the group].

Brachinus lethierrii, sp. n., *id. l. c.* p. 5, note, Atlas, Batna.

Lebiides.

Chaudoir (Ann. Ent. Belg. xv. pp. 97–204) proposes, under the name *Callidides* (too near *Callidiides* in the *Cerambycidæ*, *cf. l. c.* C. R. p. lxiii), to establish a group, of which the chief character seems to be that the ligula is bordered in front by a membrane joining the paraglossæ, a structure, however, reproduced in *Agra*, *Graphipterus*, &c. The genera now associated are *Glycia*, Chaud., *Callida*, Dej., *Stenonotum*, Lac. (= *Cylindronotum*, Putz., both preoccupied, and the name *Micragra* proposed), *Plochionus*, Dej. (subgenus *Menidius* proposed, p. 170), *Bothynoptera*, Schaum, *Euproctus*, Sol., *Xanthophæa*, Chaud., and many new genera.

The following observations occur:—*Glycia karelini*, Mots., Chaud., = *ornata*, Klug, var.; *Cymindis henoni*, Fairm., = *G. unicolor*, Chaud.; *Callida cordicollis*, Boh., = *marginicollis*, Chaud.; *C. analis*, Chaud., = *ruficollis*, F., var.;

C. angusticollis, Boh., = *nobilis*, Er.; *C. cærulea*, Laf., = *erythrodera*, Chaud., = *nigriventris*, Hope; *C. amabilis*, Boh., = *affinis*, Chaud.; *C. jucunda*, Boh., = *capensis*, Chaud.; *C. rubricata*, Mots., = *splendidula*, F.; *C. amabilis*, Chaud., is named *rufocuprea*; *C. modesta* and *similata*, Chaud., = *similis*, Rche.; *C. marginata*, Dej., = *viridipennis*, Lec.; *C. interrupta*, Chaud., = *lacunosa*, Mann.; *C. obscurata*, Mots., = *picipes*, Chaud.; *C. limbata*, Sahlb, jun., is to stand for *viridipennis*, Dej., deform.; *C. splendida*, Gory, *auricollis*, Cast., *festiva*, Brul., *dimidiata*, Rche., = *amethystina*, F.; *C. viridula*, Chaud., = *refulgens*, Sahlb.; *C. alcyonea*, Er., and *cyanescens*, Brul., ? = *smaragdula*, Rche.; *C. mœsta*, Chaud., = *conica*, Rche.; *C. cærulea*, Mots., = *thalassina*, Dej., var.; *C. tersa*, Er., *xanthoptera*, Chaud., and ? *amœnula*, Boh., = *tibialis*, Brullé; *C. elegans*, Chaud., = *rubricollis*, Dej.; *C. amœna*, Sahlb., and ? *geniculata*, Boh., and *linearis*, Sahlb., = *nigriceps*, Chaud.; *C. cinctipennis*, Chaud., = *suturella*, Rche.; *C. semirufa*, Mots., = *basalis*, Putz.; *C. brunnea* and *flava* (*fusca*), Chevr., *testacea*, Rche., = *pallidipennis*, Chaud.; *C. maura*, Mots., probably does not belong to the genus; *australis*, Er., *fenestratus*, Schm.-G., *nigrolineatus*, Chaud., and *pradieri*, Fairm., associated in Gemm. & v. Harold's Cat. with *Plochionus*, are to be therefrom withdrawn; *P. 4-notatus*, Esch., = 4-*pustulatus*, Dej.; *P. vittatus*, Lec., = *amandus*, Newm.

The author characterizes the following new genera and species :—

Merizomena, p. 100. Properly speaking, only a subdivision of *Glycia*, but pilose above, the sides of anus much punctured, and less elongate. *Cymindis basalis*, Chaud., *Agatus tricolor*, Gebl., and *Singilis dimidiata*, Mots.

Lipostratia, p. 101. Closely allied to *Callida*, but with 4th joint of tarsi not bilobed but deeply notched. *Callida dichroa*, Chaud., *C. rufula*, Gory, *L. cribripennis*, p. 102, Natal, and *mouffleti*, p. 103, Benguela, spp. nn., and ? *C. elongata*, Boh.

Spongoloba, p. 152. Apparently a transitional form between *Callida* and *Philopyga*; intermediate tarsi in ♂ with first (and sometimes second) joint lamellate beneath. *C. fulgida*, Dej., *cyanipennis*, Chaud. (= *smaragdina*, Dej., ♀), and *punctata*, Lec.

Euplatia, p. 153. Last joint of labial palpi only slightly dilated, and no lamellæ to intermediate tarsi in ♂; of wide, short, and flat build. *E. latiuscula*, *ibid.*, Ega.

Phœa, p. 154. 4th joint of all tarsi simply cordate; tarsi not spongy beneath. *Callida diluta*, Chaud.

Otoglossa, p. 158. Differs from *Micragra* (*Cylindronotum*, Putz.) in its less elongate build, smooth head and thorax, prominent eyes, and shorter, quadrate, and flat elytra. *O. tuberculosa*, *ibid.*, Minas, *semilævis* and *inæqualis*, p. 160, Ega, *terminalis*, p. 161, Rio.

Hyboptera, p. 161. Form of *Cryptobatis*, elytra tuberculate. *Lebia tuberculata*, Dej., *Aspasia verrucosa*, Reiche, *H. viridivittis*, Rio, *angulicollis*, Ega, p. 164.

Onota, p. 165. Allied to *Otoglossa*; anterior angles of paraglossæ widely subproduced-rotundate. *O. bicolor*, *ibid.*, Brazil, *Lebia*? *angulicollis*, Rche., *O. tenuicincta*, p. 166, Ega, *rutilans*, Cayenne, *elongata*, Brazil, p. 167.

Phacocerus, p. 173. Possibly only a section of *Plochionus*; mentum untoothed. *P. piceus*, *ibid.*, Minas.

Amelus, p. 174. Differs slightly from *Plochionus* in the structure of its palpi, antennæ, and tarsi. *Coptodera nigripennis*, Gory.

Metallica, p. 175. Allied to *Plochionus*, differing in labial palpi, mandibles, untoothed mentum, and metallic elytra. *Plochionus æneipennis*, Dej., *M. purpureipennis*, p. 176, Natal; *viridipennis*, p. 177, White Nile.

Crossoglossa, p. 177. Ligula wide, with long hairs, palpi not securiform, claws much pectinated, &c. *C. testacea*, p. 178, Deccan, *mellea* and *fasciata*, Moluccas, p. 179, and *Plochionus nigrilineatus*, Chaud.

Endynomena, p. 186. Allied to *Callida* and *Xanthophæa*; pubescent. *Lebia pradieri*?, Fairm.

Callida erythropyga, p. 105, and *ruficeps*, p. 108, Natal, *umbrigera*, p. 106, Gaboon, *rubiginosa*, p. 109, Benguela, *femoralis*, p. 112, Deccan, *permunda*, Celebes, *lativittis*, Deccan, p. 113, *dyschroma*, Cayenne, Bahia, *lurida*, Colombia, p. 116, *purpureipennis*, p. 117, *misella*, p. 118, Mexico, *metallescens*, Vera Cruz, *batesi*, Ega, *cayennensis*, Cayenne, p. 120, *ænea*, p. 121, Brazil, *robusta* (?=*nitida*, Putz.), Rio Negro, *guyanensis*, Guiana, p. 122, *clara*, Venezuela, *onypterygioides*, Deccan (? Colombia), p. 123, *pretiosa*, p. 124, Hayti, *lindigi*, p. 128, New Granada, *magnifica*, Venezuela, *decolor*, Martinique, p. 131, *rhyti[do]dera* and *viridimicans*, Minas, p. 134, *cavicollis*, p. 135, Brazil, *cupreipennis*, p. 136, Minas, *ambigua*, Bahia, *cuprea*, New Granada, *nigricans*, Venezuela, p. 138, *bella*, p. 140, Mexico, *convexicollis*, p. 142, *properans*, p. 143, Ega, *levistriata*, p. 144, Mexico (? Bolivia), *schistoptera*, Ega, *scutellaris*, Brazil, p. 145, *hæmatodera*, p. 146, Bolivia, *procerula*, p. 147, Parahyba and Rio, *chevrolati*, p. 149, New Granada.

Micragra lissonota, p. 155, Ega, *reichii*, p. 157, Brazil, *crenulata*, p. 158, Minas.

Plochionus pictus, p. 170, Colombia, *faviger*, p. 172, New Granada.

Euproctus xanthophæus, Cayenne, *quadrivittis*, Rio, p. 184, *putzeysi*, p. 185, Bogota.

Xanthophæa infuscata, p. 188, Tasmania, *angustula* and *pilosula*, p. 189, Melbourne, *picipennis*, p. 190, S. Australia (?=*Plochionus australis*, Er.), *lissodera*, p. 191, S.W. Australia, *parallela*, p. 192, Cape York, *ferruginea*, p. 193, *lineolata*, p. 194, N. Australia.

Inna, Putzeys, recharacterized by Chaudoir, R. Z. (2) xxiii. p. 219; it should come near *Platytarus*, and forms a passage to the *Helluonides*. It contains *I. punctata*, Putz., *Polystichus boyeri* (redescribed as new, p. 241), Solier, *Cymindis atrata*, Dej., and 3 spp. nn.

Metabletus exclamationis, Mén., is not *M. vittula*, Fairm. (to which *M. arenicola*, Woll., and *obscuroguttatus*, Hart., probably belong), but *M. fuscimaculatus*, Mots., *virgatus*, Rche., and ?*patruelis*, Chaud., should be referred to it. *M. paracenthesis*, Mots., is erroneously placed in *Dromius* by Gemm. and v. Harold. Solsky, Hor. Ent. Ross. viii. p. 177.

Agra ignobilis, p. 217, *4-spinosa*, p. 218, Cayenne, *plebeia*, p. 219, Brazil: Chaudoir, R. Z. (2) xxiii., spp. nn.

Cymindis maroccana, Reiche, Cat. Col. Alg. p. 5, note, Tangiers; *C. ehlersi*, Putzeys, S. E. Z. xxxiii. p. 168, Asturias: spp. nn.

Inna costulata, p. 242, New Granada, *granulata*, Brazil, *breviformis*, Ega, p. 243: Chaudoir, R. Z. (2) xxiii., spp. nn.

Metabletus obliquesignatus, sp. n., Solsky, *l. c.* p. 178, Astracan.

Lebia nigripicta, sp. n., Chaudoir, Bull. Mosc. xliv. 2, p. 314 (no locality mentioned).

"Gallerucidides" and "Gallerucidiæ."

Chaudoir, Bull. Mosc. xlv. 1, p. 416, proposes to establish under one of these names a distinct group, intermediate between his 'Lébiides' and 'Tetragonodérides,' and founded on *Lebidia*, Moraw., and *Gallerucidia* [*Galer-*], g. n., p. 417, which, agreeing with *Lebia* in having no epilobes to the mentum, differs from it in the want of an emargination at the inner apex of the intermediate tibiæ of the ♂, and in the anterior and intermediate tarsi of that sex having 2 rows of squamulæ beneath. From *Lebidia* it differs in the shorter lobes of the mentum, the less elongate antennæ, whereof the first 4 joints are glabrous, and the more slender tarsi, and very prominent eyes. *G. octonotata*, p. 418, Rio Janeiro, *basinotata*, p. 419, Ega, *dimidiata*, p. 420, Cuba, *id. l. c.* spp. nn. The elytra of all this group are never truncate, and the form and clothing of their tarsi beneath recalls those of *Sarothrocrepis*.

Pericalides.

Catascopus oxygonus, Chaud., is now considered not distinct from *angulatus*; *C. æneus*, Mots., *nec* Saund., is named *fuscoæneus*; *C. amœnus*, Chaud., = *elegans*, var., of which *C. australasiæ*, Hope Coll., is also a var., named *celebensis* (with which *C. lateralis*, Brullé, is queried as identical), and another var. from Cape York is named *cyaneus*; *C. versicolor*, Saund., ? = *aculeatus*, badly developed; *C splendidus*, Saund., = *costulatus*, Chaud.; *C. subquadratus*, Mots., ? = *rufipes*, Gory; and general observations on the genus are made: Chaudoir, R. Z. (2) xxiii. pp. 244–250.

Periblepsa elaphroides, Redt., = *Scopodes* (*Helæotrechus*) *elaphroides*, White. *Scopodes* (ligula and front tarsi of ♂ described) is apparently allied to *Sphallax*, Bates, = *Actenonyx*, White; and these two genera cannot be placed near *Catascopus* or *Pericalus*, but should probably form a separate group near the *Lachnophorides*. *Id.* Bull. Mosc. xlv. 1, pp. 390–392.

Catascopus diffinis, Celebes, *agnatus*, Moluccas, p. 244, *gœbeli*, Malacca, and var. ? *basalis*, Cambodia, *virens*, Celebes, p. 245, *simplex*, p. 246, Mindanao, Philippines, *cayennensis*, Cayenne, *vollenhoveni*, Sumatra, p. 248: *id.* R. Z. (2) xxiii., spp. nn.

Scopodes aterrimus, sp. n., *id.* Bull. Mosc. xlv. 1, p. 391, S. E. Australia.

Ditomides.

Carterus rufipes, Luc., clashing with *Odogenius rufipes*, Chaud., is renamed *lucasi*: Reiche, Cat. Col. Alg. p. 8, note (already published in Ann. Soc. Ent. Fr. 1861, but an unnecessary change, Chaudoir's insect being a *Ditomus*; C. H. x. p. 230).

Aristus semicylindricus, sp. n. (La Brûlerie, MS.), Gilnicki, R. Z. (2) xxiii. p. 476, Erzeroum.

Morionides.

Stereodema, g. n., Chaudoir, Ann. Ent. Belg. xv. p. 21. Allied to *Stereostoma*, Murray, but with no hook to the maxillæ, apex of labial palpi much

less wide, joints of tarsi slender and triangular, and point of prosternum bidentate. *S. corpulentum*, sp. n., *id. l. c.* p. 22, Zulu country.

Cratocerides.

Chaudoir, Ann. Ent. Belg. xv. pp. 16–21, notices the proposed disintegration of this subfamily as proposed by Lacordaire, and which he considers to comprise only *Cratocerus*, *Brachidius*, and *Basolia*, of which he monographs the species. In Gemminger and v. Harold's Catalogue, *Basolia attenuata* should be attributed to Chaudoir, and the following corrections are made:—*B. nitida*, Sol., = *lucanoides*, Mann.; *B. brasiliensis*, Gray, = *elongata*, Chaud.

Brachidius corpulentus, sp. n., *id. l. c.* p. 20 (no locality given).

Anisodactylides.

Anisodactylus binotatus. Larva described; Rupertsberger, Verh. z.-b. Wien, xxii. pp. 575 & 576.

Amarotypus, g. n., H. W. Bates, Ent. M. M. ix. p. 50. Allied to *Migadops*, but with facies of *Amara*, and with middle tarsi generally dilated. *A. edwardsi*, sp. n., *id. l. c.* p. 51, New Zealand.

Anisodactylus orientalis, sp. n., des Cottes, Pet. Nouv. no. 56, p. 223, Constantinople (brief diagnosis only).

Harpalides.

Acinopus nitidus, Fald., = *subquadratus*, Br.: *A. lævigatus*, Mén., = *minutus*, Br., both species being distributed over the greater part of the eastern basin of the Mediterranean: Gilnicki, R. Z. (2) xxiii. p. 477. *A. gutturosus*, Buq., is wrongly associated with *megacephalus*, Rossi: Reiche, Cat. Col. Alg. p. 12, note.

Acmastes haroldi, Schm., recorded from Andalusia. Perez Arcas, Act. Soc. Esp. i. p. 22.

Harpalus caliginosus, Say, extends westward over all obstacles to the base of the Sierra Nevada, but is not yet recorded from California proper: Horn, in Hayden's Geol. Surv. Montana, p. 384. *H. nigritarsis*, Sahlb., var. *b*, is redescribed and considered a good species: Thomson, Opusc. Ent. (iv.), p. 365.

Mizotrechus, g. n., H. W. Bates, Ent. M. M. viii. p. 199. Allied to *Trechicus*, Lec., but with dentate mentum, thick tarsal joints, and square thorax; also approaches *Diploharpus* in mandibles and maxillæ. *M. novemstriatus* and *lævilateris*, ibid., *ozænoides* and *præcisus*, p. 200, Amazons, *lævigatus*, Vera Cruz, *vixstriatus*, R. Janeiro, p. 200: *id. l. c.*, spp. nn.

Lachnaces, g. n., *id. ibid.* p. 201. Facies of *Olisthopus* or *Badister*, with surface of *Loxandrus*, but really allied to *Eucærus*. *L. sericeus*, ibid., *olisthopoides* and *badistrinus*, p. 202, Ega: *id. l. c.*, spp. nn.

Acinopus medius, sp. n., Reiche, *l. c.* p. 12, note, Algeria.

Dichirotrichus barbarus, sp. n., Leder, B. E. Z. xvi. p. 137, Oran.

Harpalus janthinus (? sp. n.), Des Cottes, Pet. Nouv. no. 56, p. 223, Taurus; *H. insignis* (do.), *id. l. c.* p. 224, Caucasus [mere indications of a diagnosis in each case]; *H. arenicola* (Wesmael), Sauveur, Ann. Ent. Belg. xv.

p. 226, Belgium; *H. cardiaderus*[*cardio-*], Putzeys, *ibid.* CR. p. lxxi, Asturias; *H.* (*Ophonus*) *promissus*, Reiche, *l. c.* p. 13, note, Algiers: spp. nn.

Pangus laticollis, sp. n., Reiche, *l. c.* p. 14, note, Constantine.

Eucærus opacicollis, sp. n., H. W. Bates, *l. c.* p. 202, Ega.

Trigonotomides.

Chaudoir, Ann. Ent. Belg. xv. pp. 5–16, monographs the portion of this subfamily restricted by him under the name *Drimostomides*, which he considers to form a point of transition from his *Abacetides* to the *Morionides*, though admitting their relation to the *Feroniides*. In it he includes only *Drimostoma*, Dej., and *Stomonaxus*, Mots., with 3 other genera. *D. costatum*, Laf., = *punctifrons*, Chaud.; *D. rufipes*, Boh. (? *marginale*, Walk.), and ? *Stom. sculptipennis*, Mots. (*D. ceylanicum*, Nietn.), = *S.* (*D.*) *striaticollis*, Dej. The species of *Drimostoma* described by Castelnau are probably *Abaceti*; *D. fuscipes*, Brullé, is an *Adrimus*, *D. mexicanum*, Chevr., a *Diploharpus*, *D. 4-pustulatum*, Peyr., an *Abacetus*, and *D. laticolle*, Laf., does not belong to the group. *Stomonaxus* is erroneously compared by Motschoulsky with *Drimostoma*, and certain species of the latter are transferred to it.

Strigomerus, g. n., *id. l. c.* p. 7. Antennæ filiform, 3rd joint much shorter than the rest, which are elongate-quadrate and somewhat robust; tarsi slightly pilose above, evidently unisulcate in the middle. Type *S.* (*Drimostoma*) *schœnherri*, Dej.

Hoplizomenus, g. n., *id. l. c.* p. 8. Allied to *Drimostoma* (no differential characters given). Type *H. carinatus*, sp. n., *id. l. c.*, Guinea.

Diceromerus, g. n., *id. l. c.* p. 15. Closely allied to *Stomonaxus*. Type *D.* (*S.*) *orientalis*, Mots.

Drimostoma westermanni, Guinea, *pradieri*, Gaboon, p. 10, *cribrifrons*, Gaboon, *rectangulum*, Birmah, Java, p. 11: Chaudoir, *l. c.*, spp. nn.

Stomonaxus celebensis, sp. n., *id. l. c.* p. 14, Celebes.

Feroniides.

Harpalus furvus and *H. ater*, C. R. Sahlb., *exx. typp.*, = *Pterostichus melanarius*, Ill.; *H. prætermissus*, Sahlb., *exx. typp.*, = *Amara* (*Celia*) *grandicollis*, Zimm. (*rufocincta*, Mann.), and *quenseli*, Sch., var. *floricola*, Mann.; *H. despectus*, Sahlb., *exx. typp.*, = *municipalis*, Dufts. (*modesta*, Dej.): F. W. Mäklin, S. E. Z. xxxiii. p. 242 *et seq.*

Pterostichus cupreus. Rupertsberger, Verh. z.-b. Wien, xxii. p. 7, fully describes the larva; also the pupa, found among pupæ of *Aphodius fœtens*. At p. 9 he gives particulars of the habits of the insect and of the young larvæ bred from the egg-state in captivity. *P. vulgaris*: larva and pupa described; *id. ibid.* pp. 573–575.

Platyderus varians, Schauf., is not identical with *lusitanicus*, Dej., or with *montanellus*, Graells; but *Haptoderus cantabricus*, Schauf., = *nemoralis*, Gr.: Perez Arcas, An. Soc. Esp. i. p. 126.

Pterostichus (*Tapinopterus*?) *azaræ*, Per. Arcas; redescribed from both sexes by the author and figured, *l. c.* p. 93, pl. i. fig. 7. *P.* (*T.*) *cephalotes*, des Cottes, figured, R. Z. (2) xxiii. pl. iv. fig. 3.

Feronia. Reiche, Cat. Col. Alg. p. 16, note, proposes the name *Aulacotarsus*

for the subgenus to which *vernalis*, Pz., belongs, and states that *Glyptodactylus*, proposed for the insect by des Cottes, is preoccupied [he does not say by whom: there is a *Glyphodactylus* of Chaudoir].

Steropus mannerheimi, Dej.: ♂ described, from Orenburg, by Solsky, Hor. Ent. Ross. viii. p. 180. *S. æneus*, Mots., redescribed, ♂ characters pointed out: *id. l. c.* p. 234.

Adrimus, g. n., H. W. Bates, Ent. M. M. viii. p. 176. Allied to *Loxandrus*, but with short and broad metatarsal epimera, which have straight hind margins. Ant. tarsi in ♂ dilated as in the *Anchomeni*. *Adrimus microderus*, ibid., *rufangulus* and *geminatus*, p. 177, *creperus*, p. 178, Amazons, *id. l. c.* spp. nn., and *Loxandrus viridescens*, Bates.

Platyderus angulosus, Bône, Algiers, *cyrtensis*, Constantine: Reiche, Cat. Col. Alg. p. 15, note, spp. nn.

Feronia (*Orites*) *silesiaca*, sp. n., Des Cottes, Pet. Nouv. no. 56, p. 223, Silesia.

Feronia (*Steropus*) *insidiatrix*, La Brûlerie, *ibid.* no. 45, p. 179, Spain; *S. æreipennis*, Solsky, Hor. Ent. Ross. viii. p. 234, Vladivostok: spp. nn.

Zabrus brondeli, sp. n., Reiche, *l. c.* p. 17, note, Blidah.

Amara curvicrus, Thomson, Opusc. Ent. (iv.) p. 362, Sweden; *A. africana*, Putzeys, CR. Ent. Belg. xv. p. xcix, Auseba; *A.* (*Liocnemis*) *atrivirescens*, Putzeys, *l. c.* p. c, Carthagena: spp. nn.

Anchomenides.

Pristonychus. La Brûlerie, Ann. Soc. Ent. Fr. (5) ii. 453 *et seq.*, discusses *P. inæqualis* and its allies, considering that local forms have been permitted to rank as species: according to him, *P. reichenbachi*, Schauf., *polyphemus* and *bæticus*, Ramb., and *cyanescens*, Fairm., = *inæqualis*, Panz., varr.; *P. obtusus*, Chaud., = *angustatus*, Dej., var.; *P. ellipticus* and *latus*, Schauf., *balmæ*, Delar., *latebricola*, *hypogæus*, and *pyrenæus*, Fairm., *jacquelini*, Boield., = *oblongus*, Dej.; *P. parviceps*, Fairm., *carinulatus*, Schauf., = *carinatus*, Chaud., *certe*; *P. acutangulus*, Schauf., *ex. typ.*, = *elongatus*, Dej. Abeille, Étud. Col. Cav. p. 9, also considers *P. terricola*, *cyanescens*, *latebricola*, *hypogæus*, and ? *pyrenæus* to be one species.

Calathus nubigena, Hal., considered a good species by Thomson, Opusc. Ent. (iv.) p. 364. *C. cisteloides*, *angularis*, and *fulvipes*: individuals wrongly supposed to connect these species mentioned by La Brûlerie, R. Z. (2) xxiii. p. 222.

Anchomenus (*Agonum*) *oblongus*, Dej., would clash with *oblongus*, F., if the latter species were not rightly attributable to *obscurus*, Hbst.: Reiche, Col. Cat. Alg. p. 19, note [practically, *oblongus*, F., is always used].

Sphodrus parumstriatus, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (5) ii. p. 47, ? Mediterranean district.

Diploharpus ebeninus, *rubripes*, and *striolatus*, p. 178, *sextriatus*, p. 179, Amazons: H. W. Bates, Ent. M. M. viii., spp. nn.

Pogonides.

Pogonus littoralis: observations on Chaudoir's opinion as to English re-

presentatives of this South European species by E. C. Rye, Ent. M. M. viii. p. 269.

Trechides.

Trechus longicornis in Scotland: R. Hislop, Scot. Nat. i. p. 212.

Trechus perezi, Crotch, =*fulvus*, Dej., var.; *T. spelæus*, Reitt., =*microphthalmus*, Mill.: Putzeys, S. E. Z. xxxiii. p. 167.

Anopht[h]almus. Abeille, Étud. Col. Cav. pp. 9–12 (table, pp. 24–26), divides the French species into 5 groups: 1, subgen. *Duvalius*, with elytra striated, shoulders more or less marked, of medium size, inhabiting surface caves, types *auberti, raymondi, delphinensis*, &c.; 2, not named, *A. orcinus, trophonius, consorranus*, &c.; 3, *Anophthalmus* proper, *gallicus, rhadamanthus, bucephalus*; 4, "Formes Aphænopsiennes," *A. pandellæi, minos, pluto*, &c. 5, *A. ehlersi*, transitional between *Duvalius* and *Aphænops*. Recent discoveries connect *Anophthalmus* and *Aphænops*, and possibly both with *Trechus*; if *Anophthalmus* be retained, it should be limited to species with no black pigment to the eye. *A. navarricus*, Vuill., is, under any circumstances, a *Trechus*. *A. consorranus*, Dieck, is specifically distinct from *A. orpheus*. A var. of *A. cerberus*, from Mas d'Azil, is described under the name *inæqualis*, p. 14.

La Brûlerie, Ann. Soc. Ent. Fr. (5) ii. pp. 460–467, discusses varieties of *A. cerberus*, with remarks on the influences of caves upon the variability of pecies. He reconnects *consorranus* to *orpheus*, from specimens found on a mountain, and not in caves.

Aphænops leschenaulti: habits detailed by É. Deyrolle, Bull. Soc. Ent. Fr. (5) ii. p. lxxxvii. The seat of smell seems to be in the palpi. Heat, and not light, appears to affect it. *Cf.* Ch. Brisout, *ibid.* p. lxxxviii.

Trechus complanatus, p. 167, Sierra Nevada, *artemisiæ*, p. 168, Piedmontese Alps, Putzeys, *l. c.*; *T. abeillii*, Pandellé, in Abeille's Étud. Col. Cav. p. 13, Ariége: spp. nn.

Anophthalmus trophonius, p. 13, *ehlersi*, p. 15, Abeille, *l. c.*, *A. tiresias*, La Brûlerie, Pet. Nouv. no. 65, p. 259, and *l. c.* p. 443, Ariége; *A. tenuis*, p. 420, *eremita*, p. 421, Wyandotte Cave, Indiana, Horn, Am. Nat. vi.: spp. nn.

Bembidiides.

Bembidium velox, Er. [?=*lampros*, Hbst., var.], *nec* L., is named 14-*striatum*: Thomson, Opusc. Ent. (iv) p. 361. *B. mannerheimi*, Sahlb. (*nec* Schaum), 8 *exx. typp.*=*guttula*, 7, and *obtusum*, 1 [*B. mannerheimi*, Schaum, a good species, therefore requires renaming, and *unicolor*, Chaudoir, should apparently stand for it], and confusion between *B. guttula, pusillum*, and *gilvipes*, of Mann. and Sahlb., is referred to; *B. grapii*, Sahlb., =*schuppeli*, Dej.; *B. pfeiffi*, Sahlb., =*virens*, Gyll. (*nec* Meg., which is 5-*striatum*, Gyll., var.): W. F. Mäklin, S. E. Z. xxxiii. pp. 245 & 246.

Tachys quadrinæva, sp. n., Reitter, B. E. Z. xvi. p. 177, Oran (possibly= 4-*signata*, var., *teste* Kraatz, *ibid.* note).

Bembidium crassicorne, sp. n., Putzeys, CR. Ent. Belg. xv. p. lxxi, Asturias.

DYTISCIDÆ.

Schirer (Verh. z.-b. Wien, xxii. p. 75) records the survival of water-beetles in an aquarium left dry from August to October.

Hutchinson, Ent. M. M. ix. p. 12, records species occurring near York.

Amphizoides.

Amphizoa josephi, p. 119, *lecontii*, p. 121, Vancouver's Island: A. Matthews, Cist. Ent. pt. v., spp. nn.

Haliplides.

Haliplus impressus (*flavicollis*, auctt.) being the only species known to Fabricius, represented the genus with him, and neither it nor *ruficollis*, Deg., var. *laminatus*, Schall., can be considered as being more than synonyms; *H. amœnus*, Ol., should stand for *obliquus*, F. (= *Hydroporus reticulatus*): G. R. Crotch, C. H. x. p. 205.

Haliplus andalusicus, sp. n., Wehncke, B. E. Z. xvi. p. 135, Andalusia.

Hydroporides.

Hydroporus obsoletus, Aubé, with quadrifurcate antennæ: R. Lawson, Ent. M. M. viii. p. 288.

Hydroporus ferrugineus, Lucas, is gravely stated to clash with *Hyphydrus ferrugineus*, Linn., and is named *inflatus*, by Reiche (Cat. Col. Alg. p. 24), who forgets *Hydroporus ferrugineus*, Stephens (*victor*, Aubé), and the fact of Perris having long named the Algerian species *hyphydroides* (*cf.* C. H. x. p. 230); *H. confusus*, Luc., *nec* Klug, is named *lucasi* [an alteration made in De Marseul's Cat. 1867]: Reiche, *l. c.* (v. Harold, x. p. 230, objects to this, as *confusus*, Klug, = *geminus*, F.). *H. granularis*, L., = *minimus*, Scop.; *H. reticulatus* and *obliquus* (not a *Haliplus*), F., = *versicolor*, Schall.; *H. unistriatus*, Goeze, Schr., = *parvulus*, Müll.: G. R. Crotch, C. H. x. p. 204. *H. avunculus*, Fairm., = *distinguendus*, Desbr.; *H. nigricollis*, Fairm., = *nigricollis*, Desbr.: Desbrochers, Bull. Soc. Ent. Fr. (5) ii. p. xxiii.

Hydroporus nigrita and *discretus*: T. J. Bold, Tr. North. Durh. iv. p. 375, repeats his opinion that these are sexes of one species [but does not adduce any instance of their having been taken *in copulâ*, or mention any examination of the *genitalia*].

Hydroporus subalpinus, p. 365, *incrassatus*, p. 366, Thomson, Opusc. Ent. (iv.), Sweden; *H. gracilis*, Wehncke, B. E. Z. xvi. p. 136, Malaga: spp. nn.

Colymbetides.

Noterus semipunctatus, F., = *capricornis*, Hbst.; *Ilybius 4-notatus*, Steph., should stand for the preoccupied *ater*, Deg.; *I. fenestratus*, F., confuses *fenestratus* and *fuliginosus*, and *comma*, Müll., should stand for the first, *fœtidus*, Müll., for the latter of these; *Agabus biguttatus*, Ol., ? = *nitidus*, F., var.; *A. didymus*, Ol., = *biocellatus*, Müll.: G. R. Crotch, C. H. x. p. 205. *Agabus sexualis*, Reiche, = *Gaurodytes alpestris*, Heer; *A. solieri*, Aubé, *ex. typ.* (from Schaum), = *tarsatus*, Zett. [Aubé's name is four years prior]: Thomson,

Opusc. Ent. (iv.), p. 368. *Gaurodytes angusticollis*, J. Sahlb. (*nec* Mots.)= *adpressus*, Mann.: F. W. Mäklin, S. E. Z. xxxiii. p. 247.

Ilybius ænescens, Thoms., recorded as British: E. C. Rye, Ent. M. M. ix. p. 36.

Agabus heydeni, p. 134, Sierra Nevada, *rotundatus*, p. 135, Sardinia: Wehncke, B. E. Z. xvi., spp. nn.

Ilybius kiesenwetteri, sp. n., *id. l. c.* p. 136, Harburg.

Dytiscides.

Trogus costalis, F. (1775), being a *Dytiscus*, and *T. costalis*, Ol., F. (1801), a *Cybister*, the latter is [? necessarily] named *olivieri*; *Hydaticus lineatus*, F., should stand for *stagnalis*, F., *hunteri*, Crotch, be used for the preoccupied *fasciatus*, F., and *banksi*, Cr., for the preoccupied *ruficollis*, F.: G. R. Crotch, C. H. x. p. 205 (v. Harold, *ibid.* note, objects to the latter names proposed by Crotch).

Von Frauenfeld (Verh. z.-b. Wien, xxii. p. 390) refers to *Dytiscus marginalis* and *latissimus* as giving the first indications of the approach of the phenomenon known in Germany as 'Fischaufstand,' being apparently the rushing by fishes to the surface of the water after the winter's lethargy.

Plateau (Ann. Ent. Belg. xv. pp. 205–212) publishes the results of experiments upon the powers of adherence of the tarsi of the males of *Acilius*, *Dytiscus*, and *Hydaticus* to the bodies of the females during copulation; and finds that the weight necessary for disconnexion is 13 times that of the insect. He considers that the sulcations on the elytra of the ♀ are merely of use in assisting the ♂, when in a transverse position, to secure himself on the back of the ♀. He proposes the term "sessiles" for the larger and "pédiculées" for the smaller cupules or suckers on the underside of the tarsi in the ♂.

Acilius fasciatus in early spring climbs up water-plants and basks in the sun: P. Cameron, jun., Scot. Nat. i. p. 265.

Gyrinidæ.

Dineutes caledonicus, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 177, note, pl. i. figs. 13–14 (apex of elytra of *D. australis* and this sp.), New Caledonia.

Hydrophilidæ.

Limnebius. Baudi, Bull. Ent. Ital. iv. pp. 35–40, discusses the Italian species.

Sphæridium dytiscoides, F., *ex. typ.*, is a true *Cyclonotum*, occurring at the Cape of Good Hope, and has nothing to do with *Dactylosternum abdominale*; T. V. Wollaston, Ann. N. H. (4) x. p. 114.

Cyloma, g. n., Sharp, Ent. M. M. ix. p. 152. Connects the *Sphæridiides* and *Hydrophilides*, having the short basal joint of the hind tarsus characteristic of the latter. *C. lawsonus* [*sic*], sp. n., *id. ibid.*, Auckland, New Zealand.

Philhydrus naturalis, sp. n., *id. l. c.* p. 153, Gt. Britain.

Laccobius atricephalus and *kiesenwetteri*, spp. nn., Reitter, B. E. Z. xvi. p. 178, Géryville, Oran.

Limnebius nitiduloides, p. 35, *furcatus* and *similis*, p. 37, *mucronatus*, p. 39, Baudi, *l. c.*, Italy, spp. nn.

Ochthebius maculatus, Reiche, Cat. Col. Alg. p. 27, note, Oran, Sicily [the author revives the spelling *Elophoridæ*; but the derivative can only be ἥλος]; *O. numidicus*, Reitter, B. E. Z. xvi. p. 179, Oran: spp. nn.

Paussidæ.

Paussus ludekingi, sp. n., Snellen v. Vollenhoven, S. E. Z. xxxiii. p. 82, E. India.

Staphylinidæ.

A. Fauvel, Bull. Soc. L. Norm. (2) i. pp. 6–67, pl. i., gives the completion of his treatise, headed 'Faune du Chili: Insectes, Coléoptères' [and which, apparently from the confusion of dates attending that publication, has hitherto escaped record in the present work], describing the *Staphylinidæ* of that region, with synonymy, new genera, and species (Catalogue, pp. 62–66). The present portion is from the *Pæderides* to the end of the group.

The same author, *ibid.* pp. 67–75, describes species found by C. Coquerel in the island of Réunion; and, pp. 210–214, gives various synonymic observations not necessary now to be reproduced in detail.

Solsky, Hor. Ent. Ross. viii. pp. 289–314, enumerates and describes species taken in South America by C. Solsky and Baron von Nolcken.

Aleocharides.

Fauvel, in de Marseul's 'Répertoire' &c. (L'Ab. viii. p. 176 *et seq.*) gives the following synonymical observations with others:—*Ocyusa longitarsis*, Thoms., ♀ = *ruficornis*, Ktz.; *Oxypoda nigra*, Bris., = *Leptusa incrassata*, Muls.; *O. longula*, Bris., = *exoleta*, Er.; *Homalota anthracina*, Fairm., ♀ = *halobrectha*, Shp., *H. trogophlœoides*, Woll., = *plumbea*, Wat.; *H. sinuaticollis*, Bris., = *fusca*, Sahlb.; *Phlœopora angustiformis*, Baudi, = *corticina*, Woll., which is not *reptans*, Grav.; *Gyrophæna punctulata*, Muls., = *pouceri*, Crotch, *G. despecta*, Muls., = *carpini*, Baudi, = *bihamata*, Thoms.

Microglossa, Fauvel, renamed *Nanoglossa*; *Euryglossa*, *id.*, renamed *Pachyglossa*, both being preoccupied: *id.* Bull. Soc. L. Norm. (2) ii. p. 379.

Dembowski notes the capture by Jelski in equatorial America of a small species, parasitic upon mice, and rostrate [!]. Pet. Nouv. no. 65, p. 260.

Leptusa testacea, Ch. Bris.: new to Britain. E. C. Rye, Ent. M. M. ix. p. 5.

Aleochara tæniata, Er., from Peru and Cayenne, ♂ & ♀ sexual characters described: Solsky, Hor. Ent. Ross. viii. p. 290. *A. villosa*, common in pigeons' nests: E. C. Rye, Ent. Ann. 1873, p. 8.

Calodera glabriventris, Rye; again taken in France (Dijon). Nouv. et Faits, p. cxi.

Homalota (*Bessobia*) *occulta*, ♀; characters for distinguishing it from *fungivora* ♀ given; *H.* (*Atheta*) *breviceps*, Thoms., probably = *aubæi*, Bris.; *H. londinensis*, Sharp, = *H.* (*A.*) *gyllenhali*, Thoms.; *H.* (*A.*) *opacula*, Thoms. in all probably = *hygrotopora*, Ktz.; *H. ignobilis*, Shp., = *H.* (*A.*) *fungicola*, Thoms.; *H. fungicola*, Shp., = *H.* (*A.*) *sericans*, Thoms.: Thomson, Opusc.

Ent. (iv.) p. 376. *H. parva*, Sahlb., =*parvula*, Mann.: W. F. Mäklin, S. E. Z. xxxiii. p. 247.

Homalota fossigera, Mann., redescribed: Hochhuth, Bull. Mosc. xliv. 2, p. 111. *H. difficilis* and *fimorum*, Bris., and *humeralis*, Ktz., recorded as British by D. Sharp, Ent. M. M. viii. p. 247; *H. atrata*, Mann., also recorded as British by G. C. Champion, *ibid.* *H. hepatica*, habits &c. noted: E. C. Rye, Ent. M. M. ix. p. 36.

New species:—

Falagria atra, p. 86, Kiew, *crassiuscula*, p. 87, Volhynia (with *Formica rufa*), Hochhuth, *l. c.*

Thiasophila subcorticalis, *id. l. c.* p. 90, Kiew (with *Formica pubescens*).

Crataræa rubripennis, Fauvel, in Reiche's Cat. Col. Alg. p. 28, note, Biskra.

Aleochara notatipennis, Hochhuth, *l. c.* p. 95, Kiew.

Atemeles excisus, Thomson, Opusc. Ent. (iv.) p. 371, West Gothland.

Myrmedonia kawalli, Hochhuth, *l. c.* p. 97, Volhynia, Kiew (with *Formica rufa*).

Ozypoda luctifera and *ambigena*, Fauvel, Rche. Cat. Col. Alg. p. 30, note, Bone; *O.* (?) *funicularis*, Hochhuth, *l. c.* p. 104, Kiew.

Homalota scorsicornis, p. 108, *dimidiata*, p. 109, Kiew, Hochhuth, *l. c.*; *H. platycephala*, Fauvel, Bull. Soc. L. Norm. (2) i. p. 68, I. Réunion (renamed *megacephala*, id. *l. c.* ii. p. 379); *H.* (*Aloconota*) *rivulorum*, p. 373, *H.* (*Liogluta*) *6-notata*, p. 375, *H. nigricans*, p. 376: Thomson, *l. c.*, Sweden.

Notothecta inflata, Fauvel, Rche. Cat. Col. Alg. p. 31, note, Bône.

Encephalus kraatzi, Hochhuth, *l. c.* p. 118, Kiew.

Gyrophæna (?) *rugicollis*, p. 120, *G. puncticollis* [preoccupied by Thomson] p. 121, Kiew: Hochhuth, *l. c.*

Tachyporides.

Tachyporus nitidicollis, Steph., recorded from England: J. R. Hardy, Ent. M. M. viii. p. 289. *T. discus*, Rche., certainly =*solutus*, Er., var.: Fauvel, Rche. Cat. Col. Alg. p. 32, note.

Tachyporus signifer, sp. n., Pandellé, Rche. Cat. Col. Alg. p. 32, note, Bone.

Conosoma erythrinum, sp. n., Hochhuth, *l. c.* p. 126, Kiew.

Bolitobius maacki, p. 236, *arcuatus*, p. 238, Solsky, Hor. Ent. Ross., E. Siberia: spp. nn.

Quediides.

Quedius virens, v. Rott., =*cruentus*, Ol., var.; *Q. myagrus*, v. Rott., =*semiæneus*, Steph.: Fauvel, L'Ab. viii. pp. 278 & 279. *Q. polystigma*, Wank., =*maurus*, Sahlb., a good species: Hochhuth, *l. c.* p. 133.

Quedius molochinus. Pupa described and figured: C. V. Riley, iv. Rep. Ins. Mo., p. 21, fig. 12.

Heterothops distinguendus [Grav.; but ? sp. n.], Hochhuth, *l. c.* p. 130, Kiew.

Quedius ernestini, Fauvel, Rche. Cat. Col. Alg. p. 34, note, Algeria; *Q. spelæus*, Horn, Am. Nat. vi. p. 421, Wyandotte Cave, Indiana: spp. nn.

Staphylinides.

Creophilus fulvago, Mots. (1860), found in some numbers near the Amour, in company with *maxillosus*, is maintained as a good species [it evidently = var. *ciliaris*, Leach, Steph.]; *Philonthus duplopunctatus*, Mots., = *scutatus*, Er., var.: Solsky, Hor. Ent. Ross. viii. pp. 240, 241.

Ocypus subænescens, Woll., ? = *fuscatus*, Brullé; *Philonthus marcidus*, Woll., = *concinnus*, Grav.; *P. obscuripes*, Bris., = *fulvipes*, F.; *P. libanicus*, Saulcy, and ? *mimulus*, v. Rott., = *maritimus*, Mots.; *P. dissimilis*, Baudi, = *prolixus*, Er.; *P. tenellus*, Woll., = *orbus*, Kies.; *P. rubiginosus*, Solsky, = *turbidus*, Er.: Fauvel, L'Ab. viii. p. 293 *et seq.*

Ocypus morio: two races observed. E. C. Rye, Ent. M M. ix. p. 36; T. J. Bold, *ibid.* p. 60.

Philonthus interpunctatus, Hochh., redescribed; *P. megacephalus*, Heer, = *laticeps*, Zett., nec *cephalotes*: Hochhuth, Bull. Mosc. xliv. 2, pp. 137, 139.

Glenus jelskii, sp. n., Solsky, *l. c.* p. 291, Monte Rico, Peru.

Staphylinus notatus, id. *l. c.* p. 293, Lima; *S.* (*Creophilus*) *coquereli*, Fauvel, Bull. Soc. L. Norm. (2) i. p. 71, I. Réunion: spp. nn.

Philonthus erythropterus, Oran, *fenestratus*, Bone, Teneriffe, Fauvel, Rche. Cat. Col. Alg. p. 35, note; *P. peregrinus*, p. 69, *colubrinus*, p. 70, Réunion, *id.* Bull. Soc. L. Norm. (2) i.; *P. cozalus*, Hochhuth, *l. c.* p. 142, Kiew; *P. jelskii*, p. 290, Puna, Lima, *brachypterus*, p. 297, *chlorocephalus*, p. 301, Cayenne, *trochilus*, p. 299, note, Venezuela, *limensis*, p. 300, Lima: Solsky, *l. c.*, spp. nn.

Belonuchus taczanovskii, sp. n., Solsky, *l. c.* p. 303, Monte Rico.

Trigonopselaphus nolkeni, sp. n., *id. l. c.* p. 305, New Granada.

Xanthopygius peruvianus, sp. n., *id. l. c.* p. 306, Monte Rico.

Plociopterus jelskii, sp. n., *id. ibid.*, Monte Rico.

Brachydirus picticornis, sp. n., *id. l. c.* p. 307 (S. America).

Xantholinides.

Xantholinus picipes, Thoms., = *atratus*, Heer; *X. atratus*, Thoms., is named *thomsoni*: Schwarz, B. E. Z. xvi. 154. *X. anachoreta*, Er., extends to I. Réunion: Fauvel, Bull. Soc. L. Norm. (2) i. p. 73. *Leptolinus sareptanus*, Stierl., = *nothus*, Er.: *id.* L'Ab. viii. p. 306.

Xantholinus morio, sp. n., Reitter, B. E. Z. xvi. p. 167, Frendah, Oran (renamed *melanarius*, on account of the prior *morio*, Woll.: Fauvel, *l. c.* p. 304).

Leptolinus versicolor, sp. n., Solsky, *l. c.* p. 181, Astracan.

Othius longicornis, sp. n., Thomson, Opusc. Ent. (iv.) p. 369, Sweden.

Pæderides.

Baryopsis, Fairm. & G., is very near *Latona*, not *Pinophilus*, and its maxillary palpi are figured, pl. i. fig. 1; *Œdodactylus castaneipennis*, F. & G., is a *Lathrobium*; *L. rufipartitum*, F. & G., = *dimidiatum*, Say; *Lithocharis fusciventris*, F. & G., = *obscuriventris*, F. & G.; *L. obscurella*, Er., ? = *obsoleta*, Nordm.; *Stilicus apicipennis*, F. & G., = *chilensis*, Sol.; *Œdodactylus fusco-*

brunneus, F. & G. (redescribed), tarsi figured, pl. i. figs. 2 & 3: Fauvel, Bull. Soc. L. Norm. (2) i. p. 8 *et seq.* *Lathrobium erythrurum*, v. Rott.,=*lusitanicum*, Grav.; *L. pyrenaicum*, Fairm., = *multipunctum*, Gr.; *Achenium saintpierrii*, All.,=*Scimbalium testaceum*, Er.; *A. pallidipenne*, Stierl.,=*Lathrobium dividuum*, Er.; *Dolicaon truquii*, Saulcy,=*venustus*, Peyr.; *Lithocharis maritima*, Aubé,=*pocofera*, Peyron; *L. auranitica*, Saulcy,=*fuscula*, Mann.; *L. monticola*, Hampe,=*brunnea*, Er.; *Sunius humeralis*, Rott., *ex. typ.*,=*diversicollis*, Fauv., local race: *id.* L'Ab. viii. p. 312 *et seq.* *Stilicus flavipes*, Mots.,=*similis*, Er., var.: Hochhuth, Bull. Mosc. xliv. 2, p. 149.

Lithocharis picea, Ktz., recorded from England: E. C. Rye. Ent. M. M. ix. p. 156.

Sunius humeralis, Rott.,=*diversicollis*, Baudi, ?=*filiformis*, var. *abbreviatus*, Fvel., ?=*fasciatus*, Hoch. (?=*diversus*, Aubé, var.): Solsky, Hor. Ent. Ross. viii. p. 182.

Dibelonetes biplagiatus, Sahlb.: a var. from Monte Rico, Peru, described. Solsky, Hor. Ent. Ross. viii. p. 309.

Lathrobium lethierrii, sp. n., Reiche, Cat. Col. Alg. p. 37, note, Algeria.

Dolicaon cribricollis, sp. n., Fauvel, Rche. Cat. Col. Alg. p. 37, note, Tangiers.

Scopæus ryii, sp. n., Wollaston, Ent. M. M. ix. p. 34, England.

Lithocharis africana, sp. n., Fauvel, Rche. Cat. Col. Alg. p. 38, note, Bone.

Sunius diversicollis, sp. n., *id.* Bull. Soc. L. Norm. (2) v. p. 21, Sicily, Algeria [see FAUVEL, List of Titles, *suprà*; *S. diversicollis*, Baudi, B. E. Z. xiii. (1869), p. 393].

Gnathymenus obesus, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 18, Chillan.

Pæderus chilensis, sp. n., *id. l. c.* p. 20, Valparaiso.

Pinophilides.

Tænodema elegans, sp. n., Solsky, *l. c.* p. 310 (S. America).

Stenides.

Stenus gracilicornis, Baudi, = *serpentinus*, Fauvel: *S. italicus*, Baudi, = *scaber*, Fauv.; *S. fauveli*, Bris.,=*ærosus*, Er.; *S. insidiosus*, Solsky,=*tarsalis*, Ljungh; *S. siculus*, Stierl.,=*oculatus*, Grav. Fauvel, L'Ab. viii. p. 356 *et seq.*

Stenus rogeri, Ktz., is considered a good species by Thomson, Opusc. Ent. (iv.) p. 369.

Stenus scaber, Fauvel, Bull. Soc. L. Norm. (2) v. p. 20 [see FAUVEL, List of Titles, *suprà*], Corsica, Tuscany; *S. cordicollis*, id. Rche. Cat. Col. Alg. p. 40, note, Algiers: spp. nn.

Oxytelides.

Bledius atramentarius, Rott.,=*bos*, Fauv.; *B. cornutissimus*, Woll.,=*corniger*, Ros.; *B. obscurus*, Muls., is renamed *denticollis*; *Platystethus pilosellus*, Wank.,=*capito*, Heer (nec *nodifrons*, Sahlb.); *P. constrictus*, Scriba,=*burlii*, Bris.; *P. angustipennis*, Scriba,=*nitens*, Sahlb.; *Trogophlœus brebissoni*, Fauv.,

=*plagiatus*, Kies.; *T. oculatus*, Woll., =*memnonius*, Er.; *T. exilis*, Woll., = *pusillus*, Gr.; *T. discolor*, Baudi, and *bledioides*, Woll., =*exiguus*, Er.; *Thinobius brevicollis*, Muls., ?=*linearis*, Ktz.; *T. wenckeri*, Fauv., =*longipennis*, Heer; *Planeustomus miles*, Scriba, =*cephalotes*, Er.: Fauvel, L'Ab. viii. p. 361 *et seq.* *Bledius irroratus*, Fauv., =*maculipennis*, Sol.; *Oxytelus testaceipennis*, Fairm. & G., =*sculptus*, Gr.; *Homalotrichus fuscus*, Sol., and *Trogophlœus andicola*, F. & G., =*T. luteipes*, F. & G.; *T. mersus*, F. & G., =*obscurus*, Sol.; *T. sobrinus*, F. & G., =*riparius*, Lac.; *Homalotrichus*, Sol., =*Coprophilus*, Latr., of which anatomical details are figured, pl. i. figs. 4–8: *id.* Bull. Soc. L. Norm. (2) i. p. 26 *et seq.* *Ancyrophorus venustulus*, Rosenh., ?=*homalinus*, Er., var.; *Trogophlœus aridus*, Duv., and *rubripennis*, Fauv., =*memnonius*, Er., which occurs in N. America and Cuba; *T. discolor*, Baudi, *glabricollis*, Mots., and ? *atomus*, Saulcy, =*exiguus*, Er.; *Oxytelus maritimus*, Thoms., =*perrisi*, Fauvel [again relying on Bull. Soc. L. Norm.]; the specific identity of *Platystethus cornutus*, Gyll., and *alutaceus*, Thoms. (*tristis*, Muls.), is maintained: *id.* Faune &c. iii. p. 143 *et seq.*

Bledius fuscipes, Rye. The Recorder maintains the value of this species: Nouv. et Faits, p. cliii.

Oxytelus. All species received from Eastern Siberia are specifically identical with those of Britain; but no species of *Bledius* is common to both countries. D. Sharp, P. E. Soc. 1872, p. ix.

Trogophlœus arcuatus, Fauv., *nec* Steph., renamed *croceipes*: Fauvel, Bull. Soc. L. Norm. (2) ii. p. 379.

Planeustomus (*Compsochilus*). The tarsi are 4-jointed: *id.* Faune &c. iii. p. 128, note.

New genera and species:—

Cylindrogaster, Fauvel, *ibid.* p. 213, note. Differs from *Osorius* and *Holotrochus* in its non-spatulate legs, 5-jointed maxillary palpi, want of eyes and scutellum, &c. *C. corsicus*, id. *ibid.* pl. ii. fig. 17, Corsica.

Actocharis, id. Bull. Soc. L. Norm. (2) v. p. 19 [see Fauvel, List of Titles, *suprà*]. Allied to *Thinobius*. [This genus is the prior *Actocharis* of Sharp: see Zool. Rec. vii. p. 265.] *A. marina*, id. *ibid.*, St. Vaast, Plymouth, Messina [=*readingi*, Sharp].

Oxyporus dybowskii, Solsky, Hor. Ent. Ross. viii. p. 242, E. Siberia.

Bledius puelches, Fauvel, Bull. Soc. L. Norm. (2) i. p. 28, S. Antonio, Chili; *B. bos*, id. *ibid.* v. p. 20 [see Fauvel, List of Titles, *suprà*], Oran [=*atramentarius*, Rott.]; *B. baudii*, p. 205, France, Switzerland, Germany, *obsoletus*, p. 207, Pyrenees, *strictus*, p. 211, note, Switzerland, Syria, *defensus*, p. 212, Calvados: *id.* Faune &c. iii.; *B. limbalus*, Hochhuth, Bull. Mosc. xliv. 2, p. 158, Kiew.

Platystethus debilis, p. 161, *wankowiczi*, p. 162, Kiew: *id. l. c.*

Oxytelus rugifrons, id. *l. c.* p. 164, Volhynia and Kiew; *O. brevipennis*, Fauvel, Rche. Cat. Col. Alg. p. 42, note, Algeria.

Trogophlœus araucanus, p. 35, *angulicollis*, p. 36, *nitidifrons*, p. 38, Santiago, *senex* and *luniger*, p. 40, St. Antonio, Chili: *id.* Bull. Soc. L. Norm. (2) i.

Thinobius iridipennis, id. *ibid.* p. 43, Santiago; *T. micros* and *nitens*, p. 137, *atomus*, p. 139, France: *id.* Faune &c. iii.

Ancyrophorus emarginatus, p. 141, note, Spain, *aureus*, p. 142, Switzerland, Great Britain, Corsica (=*longipennis* of English Cats.): *id.* Faune &c. iii.

Planeustomus flavicollis, id. *ibid.* p. 129, Verviers; *P. curtipennis*, id. Rche. Cat. Col. Alg. p. 43, note, Algeria.

Homaliides.

Lesteva lepontia, Baudi, = *pandellii*, Fauv.; *Lathrimæum baudii*, Ktz., *ex. typ.*, ? = *atrocephalum*, Gyl.; *Philorhinum cadomense*, Fauv., = *sordidum*, Steph.; *Anthobium obscurum*, Bris., = *scribæ*, Schauf.; *A. cribricolle*, Baudi, =*fovicolle*, Fauv.; *A. lævipenne*, Baudi, =*stramineum*, Ktz.; *A. silesiacum*, Letz., ?=*sorbi*, Gyll.: Fauvel, L'Ab. viii. p. 387 *et seq.* *Homalium nigrum*, Grav., and *florale*, Er., are identical as a species, for which *rufipes*, Fourcr., is adopted; *H. heeri*, Heer, = *vile*, Er., var.; *H. punctipenne* and *abietinum*, Thoms., are considered mere phases of *pusillum*, Gr.; *H. salzmanni*, Saulcy, ?=*allardi*, Fairm., from which *ocellatum*, Woll., is now admitted to be distinct; *Arpedium quadrum* is resolved into two races, Erichson's species being named *alpinum*; the *A. brachypterum* of British Cats.=*troglodytes*, Kies., dubiously considered a form of *brachypterum*, Grav.; *Lesteva major*, Muls., ?=*fontinalis*, Kies.; *L. muscorum*, Duv.,=*punctata*, Er.; *L. punctata*, Ktz., Duv., is renamed *heeri*; *Geodromicus suturalis, nigrita, plagiatus, lituratus, marginatus, globulicollis*, and *curtipennis* are regrouped as one species, under the name *plagiatus*; *Anthophagus abbreviatus*, F., *gracilis*, Heer, *obscuriceps*, Mots.,=*caraboides*, L.; and various errors of locality are corrected. *Id.* Faune &c. iii. p. 62 *et seq.*

Acidota ferruginea, Lac., discussed as to its claims to specific value: Hochhuth, Bull. Mosc. xliv. 2, p. 169 [*cf.* Rye, Ent. M. M. ix. p. 190].

Acidota seriata, Lec., from Lake Superior, = *crenata*, F.: W. F. Mäklin, S. E. Z. xxxiii. p. 247.

Olophrum, sp. n., from the Altvatergebirge, described, but not named: Schwarz, B. E. Z. xvi. p. 155.

Homalium rugulipenne, Rye, from Scotch and Lancashire coasts: E. C. Rye, Ent. Ann. 1873, p. 6. It occurs in abundance on the Welsh coast: *id.* Ent. M. M. viii. p. 204. *H. florale*, var. *ruficorne*, Waltl, in pigeons' nests: *id.* Ent. Ann. 1873, p. 8.

Ischnoderus, g. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 51, pl. i. figs. 9–12. Facies of certain American *Oxytelidæ*; in mouth and tarsi allied to *Anthobium*, but maxillary lobes different; ligula bilobed, as in *Eudectus*, and four first joints of tarsi very short. *Homalium insigne*, Fairm. & G.

Lesteva pandellii, Fauvel, *l. c.* (2) v. p. 18 [see FAUVEL, List of Titles], Pyrenees; *L. luctuosa*, id. Faune &c. iii. p. 103, Grande Chartreuse: spp. nn.

Homalium picipenne, sp. n., *id.* Bull. Soc. L. Norm. (2) i. p. 49, Chili.

Anthobium andicola, id. *ibid.* p. 51, Chillan; *A. octavii* and *fovicolle*, p. 18, Alps, *pruinosum*, p. 19, Corsica, *rectangulum*, p. 17, France, Italy, and Germany: *id. l. c.* v. [see FAUVEL, List of Titles, *suprà*]; *nigriceps*, p. 41, note, Corsica, *sinuatum*, p. 44, Basses-Alpes, *angusticolle*, p. 47, Maritime Alps: *id.* Faune &c. iii.: spp. nn.

Protinides.

Protinus olivieri, Saulcy,=*clavicornis*, Steph., *P. crenulatus*, Pand.,=*limbatus*, Mäkl.: Fauvel, L'Ab. viii. p. 409.

Protinus nigriceps, id. Bull. Soc. L. Norm. (2) i. p. 55, Santiago; *P. lævigatus*, Hochhuth, Bull. Mosc. xliv. 2, p. 174, Kiew: spp. nn.

Phlœocharides.

Pseudopsis sulcatus occurs in quantity near Angers: Nouv. et Faits, p. cli.

Thermocharis, subg. n. of *Phlœocharis*; no eyes, scutellum, or wings. *P.* (*T.*) *cæca*, sp. n., Eastern Pyrenees. Fauvel, Faune &c. iii. p. 22, pl. 1. fig. 4.

Piestides.

Glyptoma punctatiplicatum, Solsky, is a *Thoracophorus*: Solsky, Hor. Ent. Ross. viii. p. 313.

Chasolium ernestini, Lap., *ex. typ.*, = *Isomalus complanatus*, Er.: Fauvel, Bull. Soc. L. Norm. (2) i. p. 57, note.

Piestus (?) *lævis*, sp. n., Solsky, *l. c.* p. 311, Monte Rico, Peru.

Glyptoma bonvouloiri, sp. n., Fauvel, *l. c.* p. 59, Santiago.

Lispinus parvipennis, p. 73, *microcephalus*, p. 74, I. Réunion: *id. l. c.*, spp. nn.

Micropeplides.

Micropeplus mathani and *cælatus* (*nec* Er.), Fauvel, = *porcatus*, Payk.; *M. duvali*, Fauv., = *staphylinoides*, Msh.: Fauvel, Faune &c. iii. p. 10.

Pselaphidæ.

Trichonyx sulcicollis, Reiche, lives in company with *Ponera contracta*: Bedel, Bull. Soc. Ent. Fr. (5) ii. p. li.

Batrisus delaportii, Aubé, in numbers, associated with ants: J. Weise, B. E. Z. xvi. p. 157.

Machærites cristatus, sp. n., Saulcy, in Abeille's Étud. Col. Cav. p. 16, Ariége.

Scydmænidæ.

Scydmænus pumilio, Schaum, has been erroneously considered British: E. C. Rye, Ent. M. M. ix. p. 8.

Scydmænus præteritus, sp. n., *id. l. c.* p. 6, England (? = *sparshalli*, Schaum, *nec* Denny).

Silphidæ.

Silphides.

Necrophorus sepulchralis, Heer, redescribed by Stierlin, from a second specimen found by Frei-Gessner in the Swiss Alps; MT. schw. ent. Ges. iii. p. 475.

Silpha carinata, Hbst., = *tyrolensis*, Laich.: v. Harold, C. H. x. p. 205.

Adelops. A synopsis of 20 Pyrenæan species, including many new: Abeille, Étud. Col. Cav. pp. 17–23. La Brûlerie, Ann. Soc. Ent. Fr. (5) ii. p. 450, considers that more than one species is united under the name *abeillii*

by Abeille & Saulcy. He points out indications of confusion in other species, and suggests the existence of more new forms, thinking that the same species is only found in connected caves.

Adelops wollastoni, Jans., found in a bee's nest: H. S. Gorham, Ent. M. M. ix. p. 12.

Colon calcaratus new to France: Ch. Brisout, Bull. Soc. Ent. Fr. (5) ii. p. li.

Agyrtes bicolor feeds on larvæ of *Bibio marci*: Laboulbène, Ann. Soc. Ent. Fr. (5) ii. p. 211. It occurs among these larvæ in January, as larva, pupa, and imago: Berce & Ch. Brisout, *ibid.* Bull. p. v.

Adelops cisnerosi, Perez Arcas, An. Soc. Esp. i. p. 127, pl. 3. fig. 2, Spain; *A. kerimi*, Mte. Rosa, *gestroi*, Sardinia, p. 54, *doriæ*, p. 55, Mte. Ceppo: Fairmaire, Ann. Mus. Genov. iii., Italy; *A. curvipes*, p. 444, *novemfontium*, p. 445, *perieri*, p. 446, *crassicornis*, *oviformis*, p. 447, Ariége, *vasconicus*, p. 448, Orduña, Portuguese Pyrenees: La Brûlerie, Ann. Soc. Ent. Fr. (5) ii.; *A. crotchi*, Sharp, An. Soc. Esp. i. p. 270 (but published in 1873), Alsasua, described from ♀ (La Brûlerie, *l. c.* p. 449, describes both sexes); *A. ehlersi*, p. 17, *saulcii*, p. 19, Abeille, *l. c.*, *A. diecki*, *discontignii*, *barnevillii*, p. 18, *longicornis*, p. 19, *abeillii*, *clavatus*, p. 20, *zophosinus*, p. 21, *subasperatus*, *lapidicola*, p. 22, Saulcy, *ibid.*, Ariége; *A. grenieri*, id. *l. c.* p. 22, Vernet: spp. nn.

Choleva barnevillii, sp. n., Tournier, MT. schw. ent. Ges. iii. p. 436, Blidah.

Catops bugnioni, sp. n., *id. l. c.* p. 437, Tour d'Aï.

Anisotomides.

Hydnobius punctatus, Schm., and *spinipes*, Gyll., differentiated, and both [the latter erroneously] stated to occur in England: E. C. Rye, Ent. M. M. viii. p. 204.

Anisotoma brunnea, Stm., is quite distinct from *obesa*, Schmidt, and occurs in England: *id. l. c.* ix. p. 135.

Agathidium monographed by Ch. Brisout de Barneville: Ann. Soc. Ent. Fr. (5) ii. pp. 169–198. *A. seriepunctatum*, Bris., is wrongly placed in *Anisotoma* by Gemminger & v. Harold; *A. polonicum*, Wank., = *confusum*, Bris., ? = *piceum*, Thoms. (?? *nec* Er.). *A. pallidum*, Gyll., and *pallidum*, Fairm., are not to be associated with certainty (but if Fairmaire's species be not Gyllenhal's, it requires renaming: Von Harold, C. H. x. p. 219).

Anisotoma lunicollis, sp. n., Rye, Ent. M. M. viii. p. 203, England: *id. l. c.* ix. p. 136.

Agathidium algiricum, p. 173, *leprieuri*, p. 180, *nigriceps*, p. 193, Bone, *escoraliensis*, p. 176, Escurial, *siculum*, p. 179, Sicily, *pisanum*, p. 182, Pisa, Brisout, *l. c.*; *A. wancowiczi*, Hochhuth, Bull. Mosc. xlv. 2, p. 212, Kiew: spp. nn.

Clambidæ.

Clambus punctulum, Gyll., has been erroneously considered British: E. C. Rye, Ent. M. M. ix. p. 8.

Trichopterygidæ.

Matthews, A. Trichopterygia illustrata et descripta. A Mo-

nograph of the Trichopterygia. London: 1872, sm. 4to, pp. 189, 31 pls. [reviewed in Ent. M. M. viii. p. 277, and Nouv. et Faits, p. cxvii].

The author places the *Trichopterygia* between the *Philhydrida* (or *Hydradephaga*) and *Brachelytra*, commencing with *Nossidium* and finishing with *Ptinella*; but no affinities between any of the members of the group and *Gyrinus* or *Cercyon* are suggested. He recognizes 21 genera and 149 species, for the reception of which two families are proposed, viz. *Ptiliadæ*, in which the elytra are not truncate, and *Trichopterygidæ*, in which the elytra are truncate. In discussing the general anatomy of the group, the following observations occur:—the mandibles are ribbed transversely on the outer edge, and are capable of being turned inwards towards the gullet, so that the ribbed portions crush the food *inter se*. Gillmeister has figured the elongate curved process of the stipes as the mandible, at the articulation with which is always a large transparent membranous plate, used in clearing a space for the above-mentioned inverted use of the mandibles* (a somewhat analogous formation occurs in *Dinopsis*). The maxillary palpi are 4-jointed. Du Val's account of the buccal organs is the most correct, Erichson's being hopelessly obscure, and Gillmeister's founded on mutilated objects. There are no biarticulate setæ at the apex of the ligula. The peculiar structure of the wing is retained throughout all the genera except *Nossidium* and *Motschulskium*. The "knobbed bristle" said to exist between the claws is apparently mythical. The larvæ of *Trichopteryx*, *Pteryx*, and *Ptinella* (all that are known) resemble each other closely.

The following synonymic and other observations occur, amongst others:—*Ptenidium formicetorum*, Ktz., is adopted for *myrmecophilum*, Mots., *nec* Allib.; *P. apicale*, Gillm., Er., *terminale*, Hald., = *evanescens*, Msh.; *P. lævigatum*, Woll., *nec* Gillm., is named *brucki*, p. 82; *P. nitidum*, Bris., *nec* Heer, is named *brisouti*, ibid.; *Acteella*, Mots., = *Actidium*, Mots.; *A. transversale*, Er., = *boudieri*, Allib.; *A. filiforme*, Aubé, *mediterraneum*, Mots., = *coarctatum*, Hal.; *Ptilium canadense*, Lec., = *collani* (errore *bollani*), Mann.; *Micros*, Matth., *nec* Mots., is named *Smicrus*, p. 110; *Trichopteryx silbermanni*, Wencker, = *littoralis*, Thoms., *nec* Mots., = *variolosum*, Muls.; *T. chevrieri*, Matth., *nec* Allib., is renamed *poweri*, p. 118; *T. insularis*, Mann., = *sitkensis*, Mots.; *T. convexa*, Matth., = *conveziuscula*, Mots.; *T. cursitans*, Matth., *nec* Nietn., = *fuscipennis*, Hald. (1848), "*nomen prius usitatum*" [but not so appearing in the dated list of all prior described species given by the author], is named *dohrni*, p. 144; *Astatopteryx laticollis*, Perris, *nec* Mann., is named *perrisi*, p. 154 [but *laticollis*, Mann., is a recognized *Trichopteryx*, and Perris's insect is the type on which that author founded his genus, recognized as such by Matthews, and differing *toto cœlo* from *Trichopteryx*]; *Pteryx dimidiata* Mots., = *balteatum*, Lec.; *Ptinella proteus*, Matth., = *limbata*, Heer, ♀, = *testacea*, Heer; *P. punctipenne*, Fairm., = *denticolle*, Fairm., ♀; *P. nigrivittis*, Lec., = *pallidula*, Mots., ♀, = *quercus*, Lec.; *P. ratisbonensis*, Gillm., = *aptera*, Guér., ♀; *P. gracilis*, Gillm., = *angustula*, Gillm., ♀; *Myrmicotrichis subvittata*, Mots., ? = *æquatorialis*, Mots., ♀.

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* C. Lindemann, Bull. Mosc. xliv. 2, Séances, p. 12, also records this structure of the mandibles.

The author gives 19 excellent and highly magnified plates, in outline, of the most important portions of the external anatomy (including the cibarian organs) of all the genera, and 11 of half-bodies of all the described species; and reproduces in Latin the original descriptions of former authors, adding the revised synonymy in each case.

He characterizes the following new genera and species [no comparative diagnostic characters are given for the former, the observations here made being from the synoptical table, p. 59]:—

Eurygtilium, p. 63. Allied to *Nossidium*, but with the metasternum reaching the sides of the body. *Trichopteryx saxonica*, Gillm.; pl. xx. fig. 3.

Throscidium, p. 64, pl. iii. Differs from *Nanosella*, Mots., in the elongate posterior angles of the pronotum. *T. germaini*, pl. xx. fig. 4, *fairmairii*, fig. 5, p. 67, Chili.

Motschulskium, p. 72, pl. v. Differs from its ally *Millidium* in having the pronotum not constricted at the base. *M. sinuaticolle*, p. 74, pl. xx. fig. 9, N. America.

Microptilium, p. 107, pl. x. Allied to *Nephanes*, but with long elytra and simple posterior coxæ. *Trichopteryx pulchella*, Allib.; pl. xxiii. fig. 4.

Actinopteryx, p. 148, pl. xiii. Differs from *Pteryx* in its greatly dilated pronotum, and in its posterior coxæ being widely remote. *Trichopteryx fucicola*, Allib.; pl. xxiii. fig. 12 (and *A. australis*, sp. n., Matthews, Cist. Ent. pt. v. p. 93, Swan River, Australia).

Ptinellodes, p. 158, pl. xvii. Allied to *Trichopteryx*, but with the posterior coxæ exceedingly remote, and the mesosternum but slightly keeled. *Ptilium testaceum*, Lec. (*nec* Heer), renamed *lecontii*; pl. xxiii. fig. 8.

Ptenidium kraatzi, p. 79, pl. xxix. fig. 1, North Britain, *mannerheimi*, p. 83, fig. 2, North America.

Ptilium croaticum, p. 103, pl. xxii. fig. 7, Austria, *sharpi*, p. 101, fig. 9, Vancouver's Island, *fœrsteri*, p. 102, fig. 11, France.

Nephanes meridionalis, p. 174, pl. xxx. fig. 1. Venezuela.

Trichopteryx aubæi, pl. xxiv. fig. 1, *motschulskii*, fig. 2, p. 117, Chili, *reichii*, fig. 7, p. 119, Caracas, *wenckeri*, p. 125, pl. xxix. fig. 14, Brazil, *diffinis*, pl. xxv. fig. 13, N. America, *josephi*, fig. 14, Vancouver's Island, p. 132, *henrici*, p. 136, pl. xxvi. fig. 6, Vancouver's Island, *marseuli*, p. 137, fig. 9, France, *alliberti*, p. 139, fig. 13, Caracas, *sallæi*, p. 143, pl. xxix. fig. 10, Caracas (?=*T. fenestrata*, Gillm.), *horni*, p. 176, pl. xxx. fig. 6, Arizona.

Pteryx ducali, p. 164, pl. xxix. fig. 7, North America.

Ptenidium laticolle, sp. n., Hochhuth, Bull. Mosc. xlv. 2, p. 214, Kiew (?=*nitidum*, Bris., *nec* Heer).

Nossidium scaphidiiforme, sp. n., *id. l. c.* p. 215, Kiew.

Histeridæ.

Saprinus krinickii, Kryn., ?=*nitidulus*, var., p. 224; *S. virescens*, var. n. *violaceus* (?=*azurescens*, Stev.), S. Russia, p. 226; *S. conjungens*, Payk., var. n. *micans*, Podolia, p. 228; *S. rugiceps*, Dufts., observations on specific value. Hochhuth, Bull. Mosc. xlv. 2.

Saprinus: punctuation very variable. Koltze, B. E. Z. xvi. p. 162.

Platysoma betulinum, sp. n., Hochhuth, *l. c.* p. 219, Kiew.

Hetærius setulosus, sp. n., Reitter, B. E. Z. xvi. p. 179, Oran.

Saprinus perrisi, Marseul, L'Ab. viii. p. 415, Corsica; *S. rugipennis*, p. 225, Steppes of Novomirgorod, *asphaltinus*, p. 226, Kiew, Hochhuth, *l. c.*: spp. nn.

Onthophilus interruptus, sp. n., Reitter, *l. c.* p. 168, Oran (= *exaratus*, Ill., *ex. typ.*, Kraatz, *ibid.* p. 186).

Phalacridæ.

Olibrus particeps, Muls., recorded as British, and probably represents the *O. affinis* of British lists; *O. bicolor* is erroneously considered British: E. C. Rye, Ent. M. M. ix. p. 38. *O. ulicis*, Gyll., considered distinct from *millefolii*, Payk.: Hochhuth, Bull. Mosc. xlv. 2, p. 233.

Olistherus (Erichson, *Staphylinidæ*, changed to *Stilbus*, p. 35 of generic table), g. n., Seidlitz, Fauna Baltica, p. 157. Metasternum not extending forwards beyond the middle coxæ, separated from prosternum by a distinct mesosternum &c. *Olibrus geminus*, Ill., *piceus*, Steph., *oblongus*, Er.

Phalacrus brisouti, Rye, *l. c.* p. 8, England; *P. intermedius*, Hochhuth, *l. c.* p. 231, Kiew: spp. nn.

Olibrus pumilus, sp. n., Hochhuth, *l. c.* p. 234, Kiew.

Nitidulidæ.

Cercus sambuci. Rupertsberger, Verh. z.-b. Wien, xxii. p. 10, fully describes the larva and pupa.

Epuræa. Note on habits of Swiss species: Perrin, Nouv. et Faits, cx.

Nitidula flexuosa corroborated as British: R. Lawson, Ent. M. M. viii. p. 248. *N. castanea*, Sahlb., characterized, and is distinctly a good species, not a var. of *rufipes*: Hochhuth, Bull. Mosc. xlv. 2, p. 286.

Meligethes. Ch. Brisout (L'Ab. viii. pp. 1–36, separate pagination) publishes a synopsis of the genus, dichotomously describing 67 species known to him. According to him *M. pictus*, Rye, = *mutabilis*, Rosenh. (*cf.* Zool. Rec. viii. p. 253); *carinulatus*, Först., = *erythropus*, Gyll.; *subtilis*, Bris., is renamed *hypocrita*; *flavicornis*, Mill., = *flavipes*, Stm.; *niger*, Bris., *nec* Newm., is renamed *parvulus*. Notes of food-plants and localities are given for all the species. This paper is abstracted &c., as regards British species, by the Recorder, Ent. M. M. viii. p. 267.

Reitter, B. E. Z. xvi. pp. 125–134, pl. vii., and pp. 265–269, publishes 2 supplements to his revision of the European species. According to him, *M. anthracinus*, Bris., is a good species; *M. bonvouloiri*, Bris., probably = *æneus*, var.; *M. azureus*, Heer, = *viridescens*, Fab., var., probably the var. *germanicus*; *M. marmottani*, Bris., = *lederi*, Reitt.; *M. confusus*, Bris., probably = *obscurus*, var.; *M. parvulus*, Bris., = *memnonius*, Er.; *M. niger*, Newm., is rightly dismissed as non-existent; *M. brucki*, Reitt., = *punctatus*, Bris. The same author, *ibid.* pp. 241–264, and p. 269, discusses the South-African species known to him, including 18 new. *M. exilis* is recorded from the Cape, and the Canarian *virescens*, Woll., from S. Africa (the latter probably doubtful).

Meligethes incanus, Sturm, recorded as British, and the *M. maurus* of British lists stated to be *M. ovatus*, Sturm: E. C. Rye, Ent. M. M. viii. pp. 267 & 268.

M. pictus, Rye, occurs in an immaculate form: *id. ibid.* p. 288. *M. ochropus*, Stm., recorded as British, and *M. kunzii* asserted to be specifically distinct from *difficilis*: id. *l. c.* ix. p. 156.

Epuræa thoracica, Tournier, R. Z. (2) xxiii. p. 250, Valais; *E. heeri*, id. MT. schw. ent. Ges. iii. p. 439, Blidah: spp. nn.

Soronia lichenæa, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 180, note, New Caledonia.

Meligethes crotchi, p. 3 (=*elongatus*, Rosenh., *sec.* Reitter), *grenieri*, p. 7, Provence, *gracilis*, France, *bonvouloiri*, Switzerland, p. 10, *anthracinus*, p. 12, Provence, Pyrenees, *marmottani*, p. 19, Constantine, *syriacus*, p. 20, Jerusalem, *confusus*, p. 24, St. Germain: Ch. Brisout, *l. c.*; *M. rhenanus*, p. 126, fig. 1, Rhenish Prussia, *ranunculi*, fig. 2, Aix, *dives*, fig. 3, Moravia, p. 127 (probably = *brachialis*, Er., var., p. 267), *liguricus*, p. 128, fig. 4, Nice, *luctifer*, p. 129, fig. 5, Styria, *blandulus*, fig. 6, Rhenish provinces, *milleri*, Austria, p. 130, *solitarius*, p. 131, fig. 8, Madrid, *mellitulus*, p. 132, fig. 9, Rhenish Prussia, *saulcii* (=*picipes*, Stm., ♂, p. 267), Perpignan, *æstimabilis*, Austria, p. 133, *discolor*, p. 265, Elberfeld, *stierlini*, p. 268, Sicily, Algiers; *odiosus*, p. 245, *nebulosus*, *pulchellus*, p. 247, *cercoides*, *variabilis*, p. 248 (and varr. *bimaculatus*, *suturalis*, *confluens*, *luridipennis*, p. 249), *confertus*, p. 250, *rufiventris*, p. 251, *arcuatus*, *limbatus*, p. 252, *haagi*, *reticulatus*, p. 253, *grandicollis*, p. 254, *plumbeus*, *pygmæus*, p. 255, *serrator*, *floralis*, p. 256, *rimulosus*, p. 257, *morulus*; p. 260, *M.* (*Acanthogethes*) *ruficollis* and var. *rufus*, p. 258, *atratus*, *pubescens*, p. 259, *fritschi*, *comosus*, p. 260, *clavatus*, *capensis*, p. 261, *chevrolati*, p. 262, *latissimus* (? = *M. amplicollis*, Boh.), *strigulosus*, p. 263, *inhonestus*, p. 264, S. Africa: Reitter, *l. c.*; spp. nn.

Ips grandis, sp. n., Tournier, MT. schw. ent. Ges. iii. p. 440, Caucasus.

Pityophagus lævior, sp. n., Abeille, Étud. Col. Cav. &c. p. 29, S. France.

Rhizophagus hannenfeldi, sp. n., Tournier, R. Z. (2) xxiii. p. 251, Sunzel, Russia.

Trogositidæ.

Nemosoma elongatum. Parasitic on *Hylesinus vittatus*: J. E. Sidebotham, Ent. M. M. viii. p. 180. Attributed to *Hylesinus fraxini* and *Tomicus chalcographus* (the former probably in error) by Bischoff-Ehinger, MT. schw. ent. Ges. iii. p. 485.

Peltis. In some species the inner lobe of the maxilla does not end in a hook; and in others the anterior cotyloid cavities are closed behind. *Peltis dentata*, from Europe, is the type of *Calitys*, C. G. Thoms. (=*Nosodes*, Lec.): Pascoe, Ann. N. H. (4) x. p. 319.

Cymba, g. n., Seidlitz, Fauna Baltica, p. 34. Allied to *Peltis*: eyes very flat, sides of thorax not explanato-emarginate beneath, thorax with very acuminate anterior angles, &c. Type *Peltis procera*, Ktz.

Neaspis, g. n., Pascoe, *l. c.* p. 317. Antennæ 10-jointed, 7-jointed without the club; tarsi 4-jointed, with no indication of an atrophied basal joint; inner lobe of maxillæ unarmed. Type of a new subfamily, *Neaspidinæ*. *N. villosa*, sp. n., *id. l. c.* p. 318, Australia.

Peltis moniliata, sp. n., *id. l. c.* p. 318, Australia.

Melambia gautardi, sp. n., Tournier, MT. schw. ent. Ges. iii. p. 441, Upper Egypt.

Colydiidæ.

Sarrotrium clavicorne. Rupertsberger, Verh. z.-b. Wien, xxii. p. 12, describes the larva and pupa.

Cerylon histeroides (?): a var. from the Caucasus described by Tournier, MT. schw. ent. Ges. iii. p. 442.

Cossyphodes beccarii, sp. n., Gestro, Ann. Mus. Genov. iii. p. 49, fig., Keren, Bogos.

Cucujidæ.

Dendrophagus crenatus. Earlier stages and economy described by F. Buchanan White & D. Sharp, Ent. M. M. viii. p. 196.

A *Læmophlæus* parasitic on *Hylesinus thuyæ* and *H. aubæi* at Fontainebleau provisionally named *juniperi*: Grouvelle, Bull. Soc. Ent. Fr. (5) ii. p. xiv.

Psammæchus boudieri, Luc., reasserted to be a good species: C. A. Dohrn, S. E. Z. xxxiii. p. 485.

Diochares, g. n., Reitter, B. E. Z. xvi. p. 168. Allied to *Nausibius*. *D. depressus*, sp. n., *id. l. c.* p. 169, Frendah, Oran (=*Pediacus costipennis*, Fairm., *ex. typ.*: Kraatz, *ibid.* p. 186).

Cryptophagidæ.

Cryptophagus grandis, Ktz. British exponents, and probably also Kraatz's insect, = *C. populi*, Payk., pallid; *C. waterhousii*, Rye, = *acutangulus*, Gyll., equilaterally deformed: E. C. Rye, Ent. M. M. viii. p. 179. *C. ruficornis*, Steph., redescribed: *id. l. c.* ix. p. 38.

Haplolophus robustus, Moraw., and *Paramecosoma langi*, Solsky: Hochhuth, Bull. Mosc. xlv. 2, pp. 297 & 301, describes insects from Kiew, dubiously referred to these species.

Atomaria fimetarii occurs in *Coprinus comatus* (Fung.): H. Hutchinson, Ent. M. M. viii. p. 205. *A. badia* and *fumata*, Er., corroborated as British: E. C. Rye, *ibid.* ix. p. 9.

Cryptophagus parallelus [preoccupied by Brisout], Thomson, Opusc. Ent. (iv.) p. 387, Sweden; *C. impressicollis*, p. 253, *helveticus*, p. 254, Valais, Tournier, R. Z. (2) xxiii.; *C. dilaticollis*, pp. 443, Geneva, *hexagonalis*, p. 444, Minsk, *barnevillii*, p. 445, Sicily: *id.* MT. schw. ent. Ges. iii.: spp. nn.

Paramecosoma oculare, sp. n., Reitter, B. E. Z. xvi. p. 172, Oran.

Atomaria abeillii, p. 446, Algeria, *delicatula*, Jura, *minutissima*, Geneva, p. 447, Tournier, MT. schw. ent. Ges. iii.: spp. nn.

Ephistemus lepidus, sp. n., Hochhuth, Bull. Mosc. xlv. 2, p. 305, Museum garden, Kiew.

Lathridiidæ.

Merophysia. Synoptical table of species, by Kiesenwetter; B. E. Z. xvi. p. 163, and Nouv. et Faits, p. cxxxvii.

Lathridius testaceus, Stephens, is stated not to stand for *crenicollis*, Thoms. (=*cordaticollis*, Aubé), as, from the description, it is probably a species of *Cartodere*, Thoms.: Seidlitz, Fauna Baltica, p. 167, note [but Aubé's insect has been abundantly proved to be the same as Stephens's; the latter author gives ¾ lin. as the size of *ruficollis* and of his *testaceus*, having evidently dropped 1 line out of the dimensions of the latter in the 'Manual' by accident. The figure &c. in the 'Illustrations' is unmistakable].

Corticaria saginata, Mann., probably = *lapponica*, Zett.; a var. of *C. cylindrica*, Mann., with dark elytra, is recorded from Sweden; *C. foveola*, Mann., Thoms., *nec* Gyll., is named *depressa*: Thomson, Opusc. Ent. (iv.) p. 383 *et seq.* *C. longicollis*, Zett., Mann. (= *linearis*, Payk., Gyll.), and *C. formicetorum*, Mann.: observations on synonymy &c., Hochhuth, Bull. Mosc. xlv. 2, pp. 309 & 310.

Derotoma, g. n., Reitter, B. E. Z. xvi. p. 170. Between *Monotoma* and *Hypocoprus*; antennæ 11-jointed, club 2-jointed, maxillary palpi 4-jointed, tarsi 4-jointed, simple. *D. lederi*, sp. n., *id. l. c.* p. 171, Oran.

Reitteria, g. n., Leder, B. E. Z. xvi. p. 137. Myrmecophilous: allied to *Merophysia*, but with a distinct scutellum and no eyes, as in *Cholovocera*. *R. lucifuga*, sp. n., *id. l. c.* p. 138, Frendah, Oran.

Merophysia cretica, p. 163, *lata*, Athens, *oblonga*, Zante, p. 164, *sicula*, p. 166, Sicily: Kiesenwetter, B. E. Z. xvi., spp. nn.

Holoparamecus occultus, sp. n., Leder, *l. c.* p. 139, Frendah.

Corticaria flavescens, p. 383, Sweden, *spinulosa*, p. 385, Lapland: Thomson, *l. c.*, spp. nn.

Mycetophagidæ.

Mycetophagus variegatus, Sahlb., *ex. typ.*, = 4-*guttatus*, Müll.; *M. histrio*, Sahlb., ? = *variabilis*, var.: Kraatz, B. E. Z. xvi. p. 271.

Litargus coloratus, Rosenh., new to French fauna: Grouvelle, Bull. Soc. Ent. Fr. (5) ii. p. xiv.

Thorictidæ.

Thorictus sulcicollis, Perez Arcas. Redescribed and figured, and fresh localities given by the author, who suggests some connexion between the myrmecophilous habits of the insect and the peculiar appendages at the base of its thorax. An. Soc. Esp. i. p. 94, pl. 2. fig. 7.

Thorictus ehlersi, sp. n., *id. l. c.* p. 95, pl. 2. fig. 8, Mazarron.

Dermestidæ.

Dermestes lardarius. The larva injurious to broods of *Bombyx mori*, devouring the parent moth and eggs; also destroys *Attacus pyri* and *cynthia*, and *Psyche calvella*, decidedly not waiting for the death of the insects attacked. Means of defence suggested. Giraud: Ann. Soc. Ent. Fr. (5) ii. p. 205.

Trogoderma hieroglyphicum, sp. n., Abeille, Étud. Col. Cav. &c. p. 30, Marseilles.

Byrrhidæ.

Byrrhus dennii, Curt., recharacterized by C. A. Dohrn, S. E. Z. xxxiii. p. 483, and Erichson's description of it criticized.

Byrrhus tuscanus, sp. n., *id. l. c.* p. 485, Tuscany.

Parnidæ.

Parnus hydrobates, Kies., occurs at Kiew: Hochhuth, Bull. Mosc. xlv. 2, p. 318.

Heteroceridæ.

Heterocerus obsoletus, Curt., var. n. 4-*maculatus*: Hochhuth, *l. c.* p. 319.

LUCANIDÆ.

Rectifications in Parry's catalogue of Lucanoid Coleoptera, by the author, in Tr. E. Soc. 1872, p. 83.

Lucanus capreolus, Sulz., recharacterized, and queried as being only a var. of *cervus*, occurs in *Populus tremula* at Kiew: Hochhuth, *l. c.* p. 320.

Odontolabis stevensi, Thoms.; head of ♂ [*errore* ♀] exhibiting singular malformation of antennæ figured, Tr. E. Soc. pl. i. fig. 6.

Cantharolethrus. Observations on recorded species by F. J. S. Parry, Tr. E. Soc. 1872, p. 75 *et seq.*

Passalus cornutus, F. Larva and details, pupa, and imago figured, and the first two fully described, with observations on habits &c.: the developed larval legs are only four, the antennæ 3-jointed, the stigmata 9 pairs. C. V. Riley, iv. Rep. Ins. Mo. pp. 139–141, fig. 62.

Sphenognathus armatus, sp. n., Parry, *l. c.* p. 73, pl. 1. fig. 3, ♂, Colombia, and ? ♀, Bogota, *id. l. c.* p. 74.

Neolucanus marginatus, sp. n., C. O. Waterhouse, Ent. M. M. ix. p. 53, N. India.

Prosopocoilus[*-cælus*] *rosenbergi*, sp. n., Von Vollenhoven, Tr. E. Soc. 1872, p. 81, pl. ii. fig. 1, Java (? Siam).

Cantharolethrus buckleyi, sp. n., *id. l. c.* p. 77, pl. 1. fig. 1, ♂, fig. 2, ♀, Ecuador.

Leptinopterus affinis, pl. 1. fig. 5, *paranensis*, fig. 4, *id. l. c.* p. 80, Parana, S. Brazil: spp. nn.

Ceratognathus rufipennis, sp. n., Westwood, *ibid.* p. 82, pl. ii. fig. 2, Albany, King George's Sound.

SCARABÆIDÆ.

Coprides.

Epirinus armatus, Boh., is a *Coptorrhina*, and *C. granulifera*, Har., is probably identical with it; *Onitis nicanor*, Lec., = *caffer*, Boh.; *Onthophagus adspersipennis*, Fåhr., *ex. typ.*, = *prasinus*, Er.; *O. costipennis*, Fåhr., = *pilosus*; *O. ferrugineus*, Fåhr., is a *Caccobius*; *O. glaber*, Boh., = *interstitialis*; *O. inconspicuus*, Fåhr., = *Caccobius fuliginosus*, Roth; *O. mœstus*, Fåhr., = *anomalus*, Klug; *O. obesus*, Fåhr., = *vinctus*, Er.; *O. bituberculatus*, Scriba, = *verticicornis*, Laich.; *O. pedestris* and *scabrosus*, Fåhr., = *setosus*; *O. reflexicornis*, Redt., *turbatus*, Walk., = *spinifex*, F.: v. Harold, C. H. x. pp. 205 & 206. *Canthonosoma*, W. Macl., = *Cephalodesmius*, and *Canth. mastersi*, Macl., = *Ceph. castelnaui*, Har.; and the erection of genera from *negative* characters is unsafe. *Merodontus*, Macl., a name used by Jekel in the *Curculionidæ* (1857), is close to *Eurysternus*, one of the *Ateuchides*; *Onthophagus desectus*, Macl., = *declivis*, Har.; *O. inermis*, Macl., = *erichsoni*, Hope: *id. l. c.* p. 210.

Caccobius, Thoms.: Jekel, R. Z. (2) xxiii. p. 405 *et seq.*, discusses the characters of this genus, which he restricts to *schreberi*, L., *mundus* and *histeroides*, Ménétr., *denticollis* and *? jessoensis*, Harold, in which the prosternum is tricarinate, having a supplementary longitudinal keel, the body is glabrous, and the metasternum strongly convex, longitudinally subgibbous in the middle, and scarcely channelled. He only finds these characters in the above 5 species out of 350 others in his collection.

Onthophagus: a very small Indian species, allied to, if not identical with, *pusillus*, F., is provisionally named *myrmidon*: id. *l. c.* p. 415.

Caccophilus, g. n., *id. l. c.* p. 410. Separated from *Caccobius* by its not having a supplemental prosternal keel, its downy surface, and uniformly and slightly convex metasternum, which is distinctly channelled. *C. himalayanus*, p. 411, *pullus*, p. 416, Asia, *id. l. c.* spp. nn., and *Onthophagus vulcanus*, F., *indicus*, *aterrimus* (*nec* F., = *pusillus*, F., *sec.* Harold, but considered distinct by Jekel, and named *haroldi*, p. 416), *signatipennis*, *dorsalis*, and *punctatissimus*, Har., *fuliginosus*, Roth, and *nigritulus*, Klug.

Cacconemus, subg. n. of *Caccophilus*, id. *l. c.* p. 418. Represents *Chæridium* in the old world. Differs from *Caccophilus* in being glabrous. *Onthophagus rufipennis*, Har., and *castaneus*, Klug.

Aphodiides.

Aphodius fauveli, Har., = *timidus*, Boh.; *peregrinus*, Boh., = *hepaticus*, Roth; *productus*, Boh., = *lætus*, Wied.; *splendidulus*, Har., = *lucidulus*, Boh.: v. Harold, C. H. x. pp. 206 & 207. *A. hyperboreus*, Lec., is probably a form of *hamatus*, Say: *id. ibid.* p. 213.

Aphodius opacus, sp. n., Leconte, C. H. x. p. 193, Vancouver's Island.

Geotrupides.

Odontæus mobilicornis common at Evreux: testaceous form and ♀ most abundant. Bellier de la Chavignerie, Pet. Nouv. no. 63, p. 252.

Geotrupes subarmatus, Er., *ex. typ.*, = *lateridens*, Guér., which does not occur in Chili: Fairmaire, Ann. Soc. Ent. Fr. (5) ii. p. 48.

Enoplotrupes. Lucas, Ann. Soc. Ent. Fr. (5) ii. pp. 287–292, recharacterizes this genus, redescribing and figuring both sexes of his *E. sinensis*, pl. xiv. figs. 6–11.

Trogides.

Trox. Von Harold, C. H. ix. pp. 1–192, monographs this genus (including *Phoberus*, MacL., and *Omorgus*, Er., Lec.), recognizing 93 species, and referring to 18 others. After a very minute account of the external anatomy of the various forms, and an elaborate dichotomous table, the following observations occur (amongst many others referring to the older synonymy of certain species):—*Omorgus texanus*, Lec., = *Trox scutellaris*, Say, var.; a var. of *gemmatus*, Ol., is described, p. 66; *variolosus*, Fähr., = *radula*, Er., of which 2 varr. are described, p. 68; 2 varr. of *denticulatus*, Ol., are described, p. 71, one named *carbo*; *radula*, Boh., *nec* Er., is named *asperulatus*, p. 75; a var. *carinatus* of *alternans*, McL., is described, p. 86; *australasiæ*, Germ., *nec* Er., is named *litigiosus*, p. 88; *incultus*, Fähr., and *madagascariensis*, Fairm. (= *melancholicus*, Fähr.), = *squalidus*, Ol., varr., and a North African var. is described, p. 107; *regularis*, Har., = *costatus*, Wied.; *nobilis*, Woll., from the Cape-Verdes, = *suberosus*, F. (occurring in America from Patagonia to Pennsylvania), of which 4 varr. are described, p. 120; *Omorgus integer* and *tessellatus*, Lec., = *morsus*, Lec., varr. (= *punctatus*, Germ.); *denticulatus*, Blanch., *nec* Ol., is named *pedestris*, p. 128; a var. *bolivianus* of *pilularius*, Germ., is described, p. 140; *perrisi*, Fairm., *concinnus*, Er., = *eversmanni*, Kryn.; *alternans*, Lec., *nec* MacL., is named *lecontii*, and a var. described,

p. 157; *clathratus*, Rche.,=*cribrum*, Géné, var.; 3 forms of *perlatus* (which is referred to Goeze) are recognized, of which *chevrolati*, Har.,=*a*, and *fabricii*, Reiche (*granulatus*, F., *nec* Hbst.), is *c*; *asiaticus*, Fald.,=*hispidus* (referred to Pontoppidan), var., and a var. *nodulosus* is described, p. 165; 3 varr. of *granulipennis*, Fairm., are described, one named *mixtus* and another being 4-*maculatus*, Ball.; *variolatus*, Melsh.,=*scaber*, L.; *sulcatus*, Ol., is probably *Bolitophagus crenatus*; and *crispans*, Hbst., possibly a *Pimelia* or *Hexodon*.

The author describes the following new species:—*Trox rhyparoides*, p. 32, *nasutus*, p. 34, C. of G. Hope, *aculeatus*, p. 37, Caffraria, *caffer*, p. 41, S. Africa, *gigas*, p. 48, Adelaide, *torpidus*, p. 58, Buenos Ayres, *haagi*, p. 59, Tranquebar, Bengal, *elevatus*, p. 73, Angola, *desertorum*, p. 77, Egypt, Arabia, *niloticus*, p. 79, Nubia, Upper Egypt, *badeni*, p. 83, N. coast of Brazil, *borrii*, p. 84, Montevideo, *curvipes*, p. 90, New Holland, *stellatus*, p. 92, and *brucki*, p. 93, Australia, *fenestratus*, p. 97, Cape York, Pt. Denison, *candidus*, p. 98, E. and S.E. Australia, Queensland, and N. S. Wales, *indicus*, p. 102, East India, *candezii*, p. 113, Pampas of S. America, *batesi*, p. 126, Amazons, *procerus*, p. 127, Arabia, Senegal, *tenebrosus*, p. 130, ? S. America, *gemmingeri*, p. 134, interior of Brazil, *longitarsis*, p. 136, *chilensis*, p. 137, Chili, *sallæi*, p. 138, Bolivia, *argentinus*, p. 143, Cordova, Buenos Ayres, *acanthinus*, p. 154, Mexico, *barbarus*, p. 169, Beyruth, Egypt, *foveicollis*, p. 181, N. America.

Melolonthides.

Amphimallus flavicornis, Blanch. (? *Rhizotrogus fulvicornis*, Dej. Cat.)= *Rhizotrogus niger*, Waltl, which is truly Spanish: Perez Arcas, An. Soc. Esp. i. p. 96. *R. parvulus*, Rosenh. (*hidalgoi*, Per. MS.) is figured, and peculiarities of its antennal structure are pointed out: *id. l. c.* p. 97, pl. i. fig. 1.

An Algerian *Amphimallus* flies from 18th to 25th Dec.: Leprieur, Bull. Soc. Ent. Fr. (5) ii. p. vi.

Schismatocera, g. n., Des Cottes, MT. schw. ent. Ges. iii. p. 520. Allied to *Amphimallus*, and replacing *Schizonycha* in Europe. Type *Adoretus nitidulus*, Des C.

Rhizotrogus tornosi, sp. n., Perez Arcas, An. Soc. Esp. i. p. 98, pl. i. fig. 2, Cuenca.

Rutelides.

Phyllopertha horticola: ravages by the larva, Ent. vi. p. 62.

Anisoplia pallidiventris, Des Cottes, is an *Anomala*: Des Cottes, MT. schw. nt. Ges. iii. p. 522.

Anoplognathides.

Adoretus squamosus, Des Cottes,=*umbrosus*, F., var.: *id. ibid.* p. 523.

Dynastides.

Enoplus tridens, Montr. Development of frontal horn in ♂ from New Caledonia described and figured by Fauvel, Bull. Soc. L. Norm. (2) i. p. 183, note, pl. i. fig. 15.

Cetoniides.

Mycteristes and *Phædimus*. Lucas, Ann. Soc. Ent. Fr. (5) ii. pp. 277–279.

maintains the distinctness of these genera, and, p. 280, recharacterizes his own genus *Neophædimus*, redescribing and figuring (pl. xiv. figs. 1, 2, & 3) both sexes of his *N. auzouxi*, from Mou-Pin, Thibet.

Dicranocephalus. Lucas, *l. c.* pp. 282–284, discusses the known species, referring *D. dabrii*, Auz., to *adamsi*, Pasc., and figuring the ♂, pl. xiv. figs. 4 & 5.

Romborrhina resplendens: observations on the localities of specimens in Leyden Museum. Von Vollenhoven, Tijdschr. Ent. (2) vii. p. 125 *et seq.*

Cetonia athalia, Rche., *ex. typ.*, = *subpilosa*, Desbr.: Bedel, Bull. Soc. Ent. Fr. (5) ii. p. xxiii. *C. caucasica*, Kol., = *ærata*, Er.; Des Cottes, MT. schw. ent. Ges. iii. p. 523.

C. (Protætia) bremii, Schaum, is apparently specifically distinct from *ferruginea*, Gory; and the variability &c. of the Philippine species is discussed: Dohrn, S. E. Z. xxxiii. p. 154 *et seq.*

Cetonia (Protætia) scepsia, sp. n., Dohrn, *l. c.* p. 157, Manilla.

Buprestidæ.

In Australian species the ♂ is apparently always much smaller than the ♀. E. Saunders, P. E. Soc. 1872, p. xx.

H. Burmeister, S. E. Z. xxxiii. pp. 367–387, revises the species from the district of La Plata known to him. *Agrilus insanus*, Gemm. & v. H., ? = *incanus*, Cast.

Ancylochira splendida, Payk., = *bicolor*, F., a N. American species: Thomson, Opusc. Ent. (iv.) p. 389.

Lampetis argentata, Mann., ? = *composita*, Palis. Bauv., and is certainly rightly placed by de Marseul in this genus. Solsky, Hor. Ent. Ross. viii. p. 183.

Coræbus bifasciatus: larva makes a circular gallery round branches of *Quercus ilex*, between the bark and wood. So far from being rare in the Department of the Var, it is absolutely a noxious species. A. Champenois, Pet. Nouv. no. 43, p. 171.

Trachys quercicola, Mars., fully described: L'Ab. viii. p. 414.

Brachys æruginosa, Say: the larva mines leaves of *Fagus ferruginea*, and the larva of *Metonius lævigatus*, Say, mines those of a species of *Desmodium*: V. T. Chambers, Canad. Ent. iv. pp. 123 & 124.

Notograptus, g. n., W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 243. Nearly allied to *Anthaxia*, but with labrum rounded at apex, thorax transverse, rounded at the sides, considerably narrowed at the posterior angles, and bisinuate at the base, with a central lobe. *N. sulcipennis*, ibid., *hieroglyphicus*, p. 244, *id. l. c.*, Gayndah, Queensland, spp. nn.

Tylauchenia, g. n., H. Burmeister, *l. c.* p. 377. *Polycestides*: between *Polycesta* and *Acherusa*. *Buprestis sphæricollis*, Desm., and *B. crassicollis*, Gory, La Plata.

New species :—

Amblysterna subvittata, E. Saunders, Tr. E. Soc. 1872, p. 238, Zambesi.

Chrysochroa browni, p. 240, Ceylon, *punctatissima*, p. 241, E. Indies, *id. l. c.*

Philocteanus igneiceps, *id. l. c.* p. 242, Burmah.

Chrysaspis auricauda, id. *ibid.*, Cape Palmas.

Steraspis welwitschi, id. *l. c.* p. 243, Loando.

Cyria elateroides, id. *l. c.* p. 244, Swan River.*

Chalcotænia ajax, pl. vi. fig. 8, *quadrisignata*, fig. 4, p. 245, Queensland, *superba*, p. 246, fig. 2, Nicol Bay, W. Australia, *martini*, p. 247, *australasiæ*, p. 248, fig. 6, N.W. Australia, *id. l. c.*

Paracupta tibialis, id. *l. c.* p. 248, Owahan L., Fiji.

Halecia maculicollis, id. *l. c.* p. 249, Brazil.

Psiloptera viridiænea, H. Burmeister, *l. c.* p. 371, Pampas.

Nascio viridis, W. Macleay, *l. c.* p. 239, Gayndah.

Astræus mastersi, id. *l. c.*, Gayndah.

Melobasis azureipennis, Port Denison, *costata*, p. 240, *apicalis*, *obscura*, p. 241, Gayndah, *id. l. c.*

Anthaxia obscura, *cupr*[*e*]*ipes*, *purpureicollis*, p. 242, *nigra*, p. 243, *id. l. c.*, Gayndah; *A. orientalis*, H. Burmeister, *l. c.* p. 373, Uruguay; *A. ditescens*, Abeille, Étud. Col. Cav. p. 31, Toulon.

Neocuris mastersi and *gracilis*, W. Macleay, *l. c.* p. 241, Gayndah.

Curis splendens, id. *l. c.* p. 244, Gayndah; *C. hemiptera*, H. Burmeister, *l. c.* p. 374, Mendoza.

Polycesta mastersi, W. Macleay, *l. c.* p. 246, Gayndah.

Conognatha propinqua, H. Burmeister, *l. c.* p. 376, Corrientes, Paraguay; *C. badeni*, pl. vi. fig. 1, New Friburg, *rogersi*, fig. 9, Minas Geraes, p. 250, *paranensis*, fig. 3, p. 251, Parana: E. Saunders, *l. c.*

Stigmodera rubricauda, Queensland, *unicincta*, pl. vi. fig. 7, Adelaide, p. 252, *duboulayi*, fig. 5, p. 253, Nicol Bay, W. Australia, E. Saunders, *l. c.*; *S. mastersi*, *kreffti*, p. 245, *elongatula*, p. 246, W. Macleay, *l. c.*, Gayndah.

Chrysobothris saunderzi, p. 246, *mastersi*, *viridis*, p. 247, *id. l. c.*, Gayndah; *C. maxima*, p. 378, Santiago, *laticollis*, p. 379, *holochalcea*, p. 380, Buenos Aires, *auricincta*, Tucuman, *polyspilota*, Paraná, p. 382: H. Burmeister, *l. c.*

Ethon latipennis, W. Macleay, *l. c.* p. 247, Gayndah.

Cisseis dimidiata, *impressicollis*, *viridiaurea*, id. *l. c.* p. 248, Gayndah.

Coræbus marmoratus, id. *l. c.* p. 248, Gayndah.

Agrilus mastersi, *deauratus*, id. *l. c.* p. 249, Gayndah; *A. nobilis*, p. 383, Tucuman, *sulphurifer*, p. 384, *perplexus*, p. 386, Paraná, *decipiens*, p. 385, Buenos Aires, H. Burmeister, *l. c.*

Brachys undularia, id. *l. c.* p. 387, Buenos Aires.

Ianthe beccarii, Gestro, Ann. Mus. Genov. iii. p. 47, Bogos (antennæ figured).

EUCNEMIDÆ.

Microrhagus, Esch., = *Dirhagus*, Latr.; *Dirhagus*, Esch., = *Fornax*, Casteln.; *Hypocœlus*, Esch., = *Nematodes*, Latr.; *Hypocœlus*, Lac., is adopted for *Nematodes*, Esch., *nec* Latr.; *Hylochares*, Latr., Kies., = *Xylophilus*, Mann. [*nec* Latr.]: Seidlitz, Fauna Balt. pp. 108 & 109.

Anelastes barbarus, Luc. The insect recorded from Corsica in Nouv. et Faits, p. c, as *A. druvii*, is now referred to this species: *ibid.* p. cxiv.

Three species, of different genera, from Gayndah, Queensland, noticed by W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 249.

De Bonvouloir, Ann. Soc. Ent. Fr. (4) x. supplem. (2me. cah. pp. 289–416, pls. 22–28, 15 July, 1872; 3me. cah. pp. 417–560, pls. 29–36, 31 Dec. 1872), continues his monograph. He figures, in addition to such as he describes as new, the following species:—*Galbodema mannerheimi*, Cast., pl. 22; *Scython bicolor*, Cast., *Balistica picipes*, Mots., pl. 25; *Microrhagus clypeatus*, Hampe, *imperfectus*, Lec., *triangularis*, Say, *emii*, Rouget, pl. 26; *M. longicornis*, Hampe, pl. 28; *M. sahlbergi*, Mann., *humeralis*, Say, pl. 29; *Farsus unicolor*, Latr., *Arrhipes subacuta*, Guér., pl. 30; *Nematodes mexicanus*, Cast., *atropos*, Say, *filum*, F., pl. 31; *N. cylindricus*, Cast., and var., and *buqueti*, Guér., var., pl. 32; *Anelastidius feisthameli*, Graëlls, *Epiphanis cornutus*, Esch., *Anelastes barbarus*, Luc., *latreillii*, Lec., *Eudorus javanicus*, Cast., pl. 34; *Phyllocerus flavipennis*, Guér., ♂ and ♀, *Cephalodendrum ramicorne*, Cast., pl. 35; *Phlegon heterocerus*, Say, *buqueti*, Cast., *Cryptostoma spinicorne*, F., *nigricorne*, Westw., var., *Xylobius humeralis*, Duf., pl. 36. *Lacus laticornis*, Bonv. (p. 288), is from Ega. *Isarthrus*, Lec., = *Fornax*. Varr. of *F. tumidicollis*, Redt., are described and figured (p. 413) under the names *parens*, *minor*, *distinguendus* and *cribriceps* (pl. 20); and a var., *ruficeps*, of *Galbodema mannerheimi*, Cast., p. 444, from interior of Australia. *Rhacopus*, Hampe, *Aulacosternus*, Mots., = *Microrhagus*, Esch. *Dirhagus nitidus*, Costa, = *M. lepidus*, Ros., described in the same year. *M. chevrolati*, Stierl., = *pygmæus*, F.; var. *M. clypeatus*, Hampe, is not the ♀ of *longicornis*.

This author describes the following new genera and species:—

Cyrtostethus, p. 289. Distinguished from *Lacus*, Bonv., by the elevation of its prosternum behind, between the coxæ, the penultimate joint of post. tarsi being less than the rest united, the hind border of the propleural triangle conspicuously shorter than the inner border, &c. *C. throscoides*, p. 290, pl. 13. fig. 3, Sarawak.

Ceratus, p. 292. Antennæ as in *Diacerus*, though not in the same division as that genus. *C. insolitus*, p. 293, pl. 16. fig. 3, Java, *sodalis*, p. 294, fig. 4, Macassar.

Cladus, p. 432. Distinct from *Fornax* by its prosternum being very strongly excavated in front, with the prosternal projection very distinctly elevated behind, and by its considerably developed mandibles. The buccal organs are stated to terminate in long narrow branching filaments. *C. maxillaris*, p. 433, pl. 21. fig. 9, Teapa, Cayenne, *assimilis*, p. 435, Ega.

Euryaulacus, p. 445. Differs from *Galbodema* in its posterior coxæ and strongly pectinated antennæ. *E. carbonarius*, p. 446, pl. 22. fig 2, Cayenne, *luctuosus*, p. 447, fig. 3, Minas Geraes.

Hodocerus, p. 449. Third joint of antennæ of same size as 2nd, both together scarcely equalling the 4th; 4th joint of post. tarsis horter than the rest united. *H. malaisiensis*, p. 450, pl. 22. fig. 4, Singapore.

Dicladus, p. 451. Antennæ very short, strongly bipectinate; propleural triangle reduced to a simple band in the anterior 3rd. *D. bipectinatus*, p. 452, pl. 22. fig. 5, Malacca.

Tachycnemis, p. 454. Marginal furrow of propectus shallow, not limited internally but distinctly terminated behind, before the posterior angles, by the hinder margin of the propleural triangle. *T. nigra*, p. 455, pl. 22. fig. 6, Ega.

Dromæocnemis, p. 456. Distinguished from *Tachycnemis* by its epistoma

being less contracted at the base, and by the marginal furrows being limited internally in the anterior half. *D. sinuaticollis*, p. 457, pl. 22. fig. 7, Ega.

Acedax, p. 458. Allied to *Tachycnemis* by the marginal furrows, but with 3rd joint of the antennæ smaller than the 2nd. *A. discors*, ibid., Rio Janeiro.

Plesiofornax, p. 460. No comparative characters given, and the name is quoted for species dated 1866, viz. *P. bonvouloiri*, Coq., and *insularis*, Bonv.; the genus also comprises *P. ligniperda*, p. 462, pl. 22. fig. 8, Cayenne, Mexico, *sublucidus*, p. 464, pl. 22. fig. 9, Cayenne, Ega, *coquereli*, p. 468, Réunion, *otti*, ibid. pl. 23. fig. 1, Mauritius, *gravis*, p. 470, pl. 23. fig. 2, Brazil, Cayenne, *megacerus*, p. 471, pl. 23. fig. 3, Brazil, *confœderatus*, p. 472, pl. 23. fig. 4, and *mandibularis*, p. 474, fig. 5, Mexico, *unguicularis*, p. 475, pl. 23. fig. 6, Madagascar, spp. nn.

Microtrigonus, p. 476. Antennary furrows very wide, propleural triangle very small, prosternum very short, elytral epipleuræ not limited. *M. 4-foveolatus*, p. 478, pl. 23. fig. 7, *compressicornis*, p. 480, pl. 23. fig. 8, *semipartitus*, p. 482, pl. 23. fig. 9, *univittatus*, p. 483, pl. 24. fig. 3, Ega.

Eucalodemas, p. 485. Differs from *Microtrigonus* by its epistoma being less contracted at the base, its marginal furrows more than twice as narrow as the posterior margin of the propleural triangle, and the epipleuræ of its elytra frequently distinctly limited externally by a well marked elevated line. *E. sanguinicolle*, p. 487, pl. 24. fig. 1, Brazil, *notaticolle*, p. 488, pl. 24. fig. 2, Batchian, *brazilianum*, p. 489, pl. 24. fig. 4, and *antiquum*, p. 491, pl. 24. fig. 5 (*Fornax testaceus*, Guér., not described), Brazil.

Melanocoleus, p. 506. Metathoracic epimera visible. Differs from *Scython* in the marginal furrows of its propectus being very distinctly limited internally. *M. grossus*, p. 507, pl. 25. fig. 5, New Guinea.

Macraulacus, p. 508. Propleuræ very widely furrowed on their entire surface. *M. excavatus*, p. 509, pl. 25. fig. 8, Ega.

Entomophthalmus, p. 513. Near *Microrhagus*, but pronotum not contracted in front, rather subquadrangular, with posterior angles and front margin carinate-elevate; 2nd and 3rd joints of antennæ globular, together not so long as 4th joint. *E. interruptus*, p. 515, pl. 25. fig. 9, Brazil, *americanus*, p. 516, New Friburg, Rio Janeiro, *pallens*, p. 518, Tennessee, *brevicollis*, p. 519, *fugax*, p. 520, Sarawak, *minutus*, p. 521, St. Catherine.

Fornax debilis, p. 309, pl. 16. fig. 2, Colombia, *guinecnsis*, p. 310, Guinea, *ater*, p. 312, pl. 13. figs. 4 & 5, New Guinea, Batchian, Gilolo, &c., *morosus*, p. 313, pl. 13. figs. 6 & 7, Ceram, Ceylon, &c., *pictus*, p. 317, pl. 13. fig. 9, Dorey, *thoracicus*, p. 319, pl. 14. fig. 1, Batchian, *subquadratus*, p. 320, pl. 14. fig. 2, Singapore, *australis*, p. 321, pl. 14. fig. 3, and *substriatus*, p. 323, pl. 14. fig. 4, Batchian, *punctcollis*, p. 324, pl. 14. fig. 5, Celebes, *latus*, p. 325, pl. 14. fig. 6, Aru, *elegantulus*, p. 327, pl. 14. fig. 8, Ceylon, *dohrni*, p. 329, pl. 14. fig. 9, no locality known, *seponendus*, p. 330, Mysol, *clarki*, p. 331, pl. 15. fig. 1, Tejuca, *sinuatus*, p. 333, pl. 15. fig. 2, Cayenne, *virginum*, p. 334, and *striatulus*, p. 335, fig. 3, Ega, *salax*, p. 336, pl. 15. fig. 4, Cayenne, *lacerda*, p. 337, pl. 15. fig. 5, Bahia, *meridianus*, p. 341, pl. 15. fig. 7, Cayenne, *adelitus*, p. 342, New Holland, *westermanni*, p. 344, Brazil, *fairmairii*, p. 345, ? Java, ? Rio Janeiro, *subacuminatus*, p. 346, pl. 15. fig. 8, Dorey, *tenuis*, p. 348, pl 15, fig. 9, Ceram, *parvulus*, p. 349, pl. 16. fig. 1, Victoria, *superbus*, p. 350, pl. 16. fig. 5, Malay Islands, *mirabilis*, p. 352, pl. 16. fig. 6, Sarawak *venustus*, p. 354,

pl. 16. fig. 7, Batchian, *spectabilis*, p. 355, pl. 16. fig. 8, Sarawak, *arrogans*, p. 357, pl. 16. fig. 9, Amboina, *incisus*, p. 358, pl. 17. fig. 1, Singapore, *adnexus*, p. 359, pl. 17. fig. 2, Sarawak, New Guinea, *mysolensis*, p. 364, pl. 17. fig. 5, Mysol, *novator*, p. 365, Malacca, *collega*, p. 367, pl. 17. fig. 6, Sumatra, *sternalis*, p. 368, pl. 17. fig. 7, Batchian, *stupefactus*, p. 369, Java, *infrequens*, p. 371, pl. 18. fig. 1, Mexico, *consentaneus*, p. 373, pl. 18. fig. 3, Colombia, *dissimilis*, p. 375, New Friburg, *molestus*, p. 376, pl. 18. fig. 4, N. America, *subdentatus*, p. 379, pl. 18. fig. 6, Colombia, *confusus*, p. 383, pl. 18. fig. 8, Mexico, *ventralis*, p. 385, pl. 18. fig. 9, Colombia, *affinis*, p. 386, pl. 19. fig. 1, Mexico, *perfidus*, p. 387, and *pilosellus*, p. 388, pl. 19. fig. 3, Brazil, *macrocerus*, p. 389, pl. 19. fig. 4, Madagascar, *intermedius*, p. 391, pl. 19. fig. 5, no locality known, *filicornis*, p. 392, pl. 19. fig. 6, Madagascar, *mendax*, p. 393, pl. 19. fig. 7, Mexico, *variepunctatus*, p. 396, pl. 19. fig. 9, Cayenne, *gibbosus*, p. 397, and *mniszechi*, p. 402, Brazil, *lineatus*, p. 403, pl. 20. fig. 2, New Guinea, *pisciformis*, p. 405, pl. 20. fig. 3, Brazil, *costulatus*, p. 408, pl. 20. fig. 5, Ceram, Java, *planus*, p. 410, pl. 20. fig. 6, Waigiou, *tarsalis*, p. 411, pl. 20. fig. 7, Bangkok, *africanus*, p. 418, pl. 21. fig. 2, Senegal, *variipennis*, p. 421, pl. 21. fig. 4, Teapa, Brazil, *notabilis*, p. 423, Mexico, *sericeus*, p. 426, pl. 19. fig. 2, Brazil, *fraudulentus*, p. 427, pl. 21. fig. 6, and *senilis*, p. 430, fig. 8, Cayenne.

Eucalosoma bilineatum, p. 438, pl. 17. fig. 9, Brazil.

Scython coloratus, p. 494, pl. 24. figs. 6 & 7, Borneo, Malayan peninsula, *nigriventris*, p. 496, fig. 8, Mysol, *apicalis*, p. 498, fig. 9, Malayan Islands, Gilolo, *nigripennis*, p. 501, pl. 25. fig. 2, Malayan peninsula, *maculicollis*, p. 502, fig. 3, Sarawak, Hong Kong, *ultimus*, p. 503, fig. 4, Sumatra, *velutinus*, p. 504, Madagascar.

Microrhagus eximius, p. 532, Mysol, Ceram, *derelictus*, p. 544, pl. 26. fig. 2, Dorey, *pyrenæus*, p. 548, fig. 4, Pyrenees, *neglectus*, p. 549, fig. 5, New Friburg, *oblitus*, p. 552, Illinois, *amazonicus*, p. 554, fig. 7, Ega, *alienus*, p. 555, Rio Janeiro, *fragilis*, p. 558, fig. 9, Caraccas, *peregrinus*, p. 559.

Elateridæ.

Elater præustus, Schiödte (*nec* Fab.), = *pomorum*, Geoffr. [Schiödte's insect is almost certainly the *pomonæ* of Stephens]; *E. coccineus*, Schdt., = *sanguineus*, L.: Thomson, Opusc. Ent. (iv.) p. 388.

Melanotus: the posterior coxæ are not always narrow and slightly and imperceptibly enlarged on the inner side, as Candèze states. Abeille, Étud. Col. Cav. p. 33.

Athous difformis, Lac., taken in Kent, figured in Ent. Ann. 1873, fig. 5.

Dima perezi, Seidl. (*Celox dima*, Schauf.), figured by Perez Arcas, An. Soc. Esp. i. pl. 3. fig. 6, and the characters &c. of the genus discussed, p. 129.

Agriotes mancus, Say: larva and pupa fully described and figured, and general account of its ravages, by J. Pettitt, Canad. Ent. iv. pp. 3-6. *A. sordidus*, Ill., corroborated as British: G. C. Champion, Ent. M. M. ix. p. 12.

Hemiopsida, g. n., W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 261. *H. masterzi*, ibid., Gayndah.

New species:—

Agrypnus mastersi, p. 249, *latior*, p. 250: *id. l. c.*, Gayndah.

Lacon gayndahensis, p. 250, *alternans*, *maculatus*, *granulatus*, p. 251: *id. l.c.*, Gayndah.

Monocrepidius mastersi, *striatus*, *acuminatus*, *breviceps*, p. 252, *rubicundus*, *atratus*, *minor*, p. 253, *submarmoratus*, *fulvipennis*, *nebulosus*, p. 254, *subflavus*, *submaculatus*, *albidus*, *subgeminatus*, p. 255, *candezii*, *elongatulus*, *castaneipennis*, p. 256: *id. l. c.*, Gayndah.

Elastrus flavipes, id. *l. c.* p. 257, Gayndah.

Elater mastersi, id. *ibid.*, Gayndah.

Cryptohypnus variegatus, id. *ibid.*, Gayndah.

Cardiophorus mastersi, id. *l. c.* p. 258, Gayndah.

Melanotus sublucens, Abeille, *l. c.* p. 32, Ste. Baume.

Athous jugicola, Perez Arcas, *l. c.* p. 101, pl. 1. fig. 6, Spain.

Corymbites rufipennis and *nigrinus*, W. Macleay, *l. c.* p. 258, Gayndah.

Ophidius brevicornis, id. *l. c.* p. 259, Gayndah.

Acroniopus rufipennis, p. 259, *pubescens*, p. 260: *id. l. c.*, Gayndah.

Dima assoi, Perez Arcas, *l. c.* p. 131, pl. 3. figs. 4 & 5, Arragon.

Ludius candezii, Fauvel, Bull. Soc. L. Norm. (2) i. p. 185, note, Lifu; *L. atripennis*, W. Macleay, *l. c.* p. 259, Gayndah.

Ascesis (?) *mastersi*, id. *l. c.* p. 260, Gayndah.

Dicteniophorus vitticollis, p. 260, *apicalis*, *vittatus*, p. 261: *id. l. c.*, Gayndah.

Cebrionidæ.

Cebrio getschmanni, sp. n., Chevrolat, Ann. Soc. Ent. Fr. (5) ii. p. 409, Sierra Morena.

Rhipidoceridæ.

Psacus mastersi, sp. n., W. Macleay, *l. c.* p. 313, Gayndah.

Dascillidæ.

Sharp, Ent. M. M. ix. p. 154, revises certain British species. *Helodes bohemanni*, Mann., = *livida*, var.; but British *livida* does not seem to agree with *livida* or *bohemanni* of Tournier; *Cyphon pallidiventris*, Thoms., ♂ = *nitidulus*, ♀.

C. Moore, J. G. Soc. xxvi. pp. 261–263, pl. xviii., notices the elytra of a fossil species of *Cyphon*, accompanied by traces of a larva, in marly bed of the Rocky River, N. S. Wales.

Dascillus parallelus, C. A. Dohrn, S. E. Z. xxxiii. p. 482, Vallombrosa; *D. brevicornis*, W. Macleay, *l. c.* p. 313, Gayndah: spp. nn.

Helodes chrysocomes, sp. n., Abeille, Étud. Col. Cav. p. 34, Basses-Alpes.

Cyphon punctipennis, sp. n., Sharp, *l. c.* p. 155, Scotland.

Telephoridæ.

Lycides.

Metriorrhynchus femoralis, *nigripes*, p. 262, *marginicollis*, p. 263, W. Macleay, *l. c.*, Gayndah: spp. nn.

Calochromus guerini, sp. n., *id. l. c.* p. 263, Gayndah.

Lampyrides.

Luciola flavicollis, sp. n., W. Macleay, *ibid.*, Gayndah.

Telephorides.

Telephorus bilineatus, Say. Larva fully described and figured: C. V. Riley, iv. Rep. Ins. Mo. p. 30, fig. 15; stigmata 9 pairs, not 13, as attributed by Walsh to *Chauliognathus*. It is parasitic on *Carpocapsa* (*Lepidopt.*).

Biurus, Mots., originally corrected to *Diurus*, and then clashing with *Diurus*, Pasc. (*Brenthidæ*), is changed to *Dissacurus* by Gemminger, C. H. x. p. 307.

Telephorus flavipennis, *ruficollis*, *mastersi*, W. Macleay, *l. c.* p. 264; *T. distinguendus*, des Cottes, Pet. Nouv. no. 56, p. 224, Salève and Paris: spp. nn.

Malthinides.

Malthodes. Kiesenwetter, B. E. Z. xvi. pp. 369–392, pls. iv. & v., commences a revision of the European species, figuring in outline the apical abdominal segments of the males of 64 of them. Referring to the enormous number of known ♀ individuals of *M. brevicollis* and the excessive rarity of the ♂, and also to the various species of which only the ♀ is known, the author suggests parthenogenesis as an explanation, pointing out that in *M. brachypterus*, and in a less degree also in *M. brevicollis*, an arrest of development, suggestive of the ♀ of *Psyche*, occurs. *M. meloiformis*, Linder, is considered to be described from an aborted form of a ♀, similar forms of that sex often occurring, though never of the ♂. *M. hispanicus*, Baudi, = *validicornis*, Kies.

Ichthyurus depressicollis, sp. n., W. Macleay, *l. c.* p. 264, Gayndah.

Malthodes simplex, p. 372, pl. iv. fig. 2, Naples, *tristis*, p. 373, fig. 4, Görz, Upper Italy, *græcus*, p. 374, fig. 5, Greece, *turcicus*, p. 375, fig. 6, Constantinople, *volgensis*, p. 377, fig. 10, Sarepta: Kiesenwetter, *l. c.*, spp. nn.

Malachiides.

Hapalochrus vittatus, F. Moraw., ♀ described from Astracan, p. 183; *H. fulvicollis*, Gebl., p. 184, Crimea, and *maculicollis*, Mots., p. 185, Astracan, redescribed. Solsky, Hor. Ent. Ross. viii.

Ebæus thoracicus frequents nests of *Chalicodoma muraria* (*Hymenopt.*), on which it is apparently parasitic: Bedel, Bull. Soc. Ent. Fr. (5) ii. p. li.

Balanophorus, g. n., W. Macleay, *l. c.* p. 267. *B. mastersi*, sp. n., *id. ibid.*, Gayndah.

Laius mastersi, sp. n., *id. l. c.* p. 265, Gayndah.

Malachius luridicollis, sp. n., *id. ibid.*, Gayndah.

Carphurus cyaneipennis, p. 265, *elongatus*, *apicalis*, *azureipennis*, p. 266, *pallidipennis*, p. 267, *id. l. c.*, Gayndah: spp. nn.

Troglops angustatus, sp. n., Reitter, B. E. Z. xvi. p. 181, Frendah.

Dasytides.

Cerallus. Kiesenwetter, B. E. Z. xvi. pp. 314–318, revises this genus.

Lobonyx gracilis, sp. n., Reitter, *l. c.* p. 180, Frendah.

Henicopus kiesenwetteri, sp. n., *id. l. c.* p. 181, Frendah.

Haplocnemus trinacriensis, sp. n., Ragusa, Bull. Ent. Ital. iv. p. 82, pl. 1. figs. 1 & 1 *a*, Italy.

Cerallus brevicollis, p. 314, Sarepta, *luteus*, p. 315, ? Turkey, *concolor*, p. 316, Turkey in Asia, *hispanicus*, S. Spain, *bicolor*, Sarepta, p. 317: Kiesenwetter, *l. c.*, spp. nn.

CLERIDÆ.

W. Macleay, Tr. Ent. Soc. N. S. W. ii., describes the following new species from Gayndah, Queensland :—

Cylidrus basalis, p. 268.

Opilus incertus, p. 269.

Natalis mastersi, ibid.

Stigmatium mastersi, p. 269, *lævius* and *ventrale*, p. 270.

Thanasimus sculptus, p. 271.

Clerus mastersi and *apicalis*, ibid.

Aulicus rufipes and *fovicollis*, p. 272.

Tarsostenus pulcher, p. 272, *mastersi*, p. 273.

Eleale fasciata, p. 273, *apicalis*, *elongatula* and *viridicollis*, p. 274.

Tenerus ruficollis, p. 275.

Pylus pallipes, ibid.

LYMEXYLIDÆ.

Lymexylum navale corroborated as British: J. Chappell, Ent. M. M. ix. p. 158; Ent. Ann. 1873, fig. 4.

CUPESIDÆ.

Cupes ocularis, sp. n., Pascoe, Ann. N. H. (4) x. p. 319, Japan.

PTINIDÆ.

Hadrobregmus canaliculatus, Thoms.,=*Anobium nitidum*, Stm.; *A. fulvicorne*, Thoms.,=*fagicola*, Muls.: Thomson, Opusc. Ent. (iv.) p. 381.

Anobium: ravages recorded by E. C. Rye, Ent. M. M. ix. p. 59. *A. striatum* perforating silk ribbon: Ent. vi. p. 39.

Pseudochina thoracica, F. Moraw., Sarepta, is not a *Xyletinus*: Solsky, Hor. Ent. Ross. viii. p. 186.

Dorca[do]toma bovistæ. On habits of earlier stages, *cf.* Sidebotham, Ent. M. M. viii. p. 180.

Hedobia regalis. v. Frauenfeld, Verh. z.-b. Wien, xxii. p. 395, refers to its economy in connexion with *Diospyrus lotus*.

Ptinus serpunctatus occurs plentifully at Bellevue in entrances of nests of mason bees: Bedel, Bull. Soc. Ent. Fr. (5) ii. p. li.

Niptus hololeucus swarming: A. Nash, Ent. M. M. ix. p. 119; J. Weise, B. E. Z. xvi. p. 158.

Ozognathus cornutus, Lec., bred from an oak-gall (*Cynips californica*, Riley, MS.), and its habits (especially in copulation) recorded by A. Müller, P. E. Soc. 1872, p. xxxii.

Dryophilus densipilis, sp. n., Abeille, Étud. Col. Cav. p. 34, Marseilles.

Ernobius canaliculatus, sp. n., Thomson, Opusc. Ent. (iv.) p. 380, Sweden.

Ptinus albimaculatus, sp. n. W. Macleay, *l. c.* p. 276, Gayndah.

Bostrychidæ.

Bostrychus (*Amphicerus*) *bicaudatus*, Say, and *Sinoxylum basilare*, Say. An account of the ravages of the former in apple-trees, and of the latter in grape-vines, with figs.: C. V. Riley, iv. Rep. Ins. Mo. pp. 51–54, figs. 24–27.

Rhizopertha elongatula and *gibbicollis*, spp. nn., W. Macleay, *l. c.* p. 276, Gayndah.

Bostrychus bispinosus, ibid., *cylindricus*, p. 277, *id. l. c.*, Gayndah: spp. nn.

Cioidæ.

Cis jacquemarti. The basal joint of the antennæ in the larva is cylindrical and highly developed, supporting two 2-jointed branches, the lower joint of each of which is thick and conical, and the apical elongate. C. Lindemann, Bull. Mosc. xliv. 2, Séances, p. 12.

Tenebrionidæ.

Epiphysides.

Epiphysa ovata, p. 133, Benguela, *ciliata*, p. 134, Angola: F. Bates, Ent. M. M. ix., spp. nn.

Tentyriides.

Aryenis, F. Bates, allied to *Sphenaria*, Mann., must be removed to the *Epitragides*: W. F. Mäklin, S. E. Z. xxxiii. p. 247. This genus is reasserted by its author to be allied to *Evaniosomus*, Guér., through *Chorasmius*, F. B.: Ent. M. M. ix. p. 97.

Chorasmius, F. Bates: the elytra are entirely margined at the base. *Id. l. c.* p. 135.

Aryenis haagi, sp. n., *id. l. c.* p. 134, Peru.

Epitragides.

Epitrichia (*Helops*) *tomentosa*, Gebl., belongs to this group, near *Himatismus*, and not to the *Tentyriides*. W. F. Mäklin, *l. c.* p. 247.

Cryptochilides.

Haag-Rutenberg, B. E. Z. xvi. pp. 273–313, monographs the group, which now consists of 6 genera (3 new) and 31 species. The character of denticulation to the front tibiæ in *Cryptochile* is only sexual, and the scutellum is not absent. *C. maculata*, Sol., *nec* F., is named *granulata*; *distincta*, Sol., = *tomentosa*, Hbst.; *vicina*, Sol. (in error quoted as *distincta*, p. 287), = *costata*, F., var.; *penicillata*, Sol., = *minuta*, Ol., var.; *gayi*, Sol., = *assimilis*, Sol., ♂, of which *crassipes*, Sol., is ♀ var.; *trilineata*, Sol., = *globulum*, Sol., ♂. *Horatoma sedecimcostata*, Sol., = *parvula*, Sol., var. The following new genera and species are described:—

Saccophorus, p. 303. Distinct from *Pachynotelus*, *Horatoma*, and *Epipagus* in the structure of its antennæ, thorax, and tarsi. *S. crenulatus*, p. 304, Cape of Good Hope.

Horatomodes, p. 305. Differs from *Saccophorus* in its tarsi being normal, and from all others in having the 9th and 10th joints of its antennæ capitulate: forms a transition to *Pachynotelus*. *H. batesi*, ibid., Damara Land.

Epipagus, p. 311. Differs from *Cryptochile* in its emarginate prosternum, from *Saccophorus* and *Horatomodes* in the structure of its antennæ, and from *Horatoma* in its different anterior tibiæ and differently sculptured thorax. Facies of a very small *Pimelia*. *E. benguelensis*, p. 312, Benguela.

Cryptochile tessulata, p. 281, *bipunctata*, p. 285, *curta*, p. 287, *undata*, p. 288, *denticollis*, p. 289, *consita*, p. 291, *puncticosta*[*ta*], p. 293, *affinis*, p. 295, *circulum*, p. 290, Cape of Good Hope.

Pachynotelus albistriatus and *albinotatus*, p. 308, Kuisip, S. Africa.

Horatoma tuberculata, p. 310, Cape of Good Hope.

Asidides.

Asida horrens, Schauf. (1869), = *reichii*, All. (Oct. 1868), = *cardonæ*, Perez Arcas (Sept. 1868); *A. moræ*, Per. Arcas (Sept. 1868), has nothing to do with *crassicollis*, Fairm. (Oct. 1868), of which Allard treats it as a synonym. Perez Arcas, An. Soc. Esp. i. pp. 105 & 106.

Asida zapateri, sp. n., *id. l. c.* p. 103, pl. i. fig. 5, Arragon.

Pimeliides.

Polpogenia rimosa, sp. n., F. Bates, Ent. M. M. ix. p. 149, Niger (differences between *Polpogenia* and *Pterolasia* pointed out, *ibid.*).

Pedinides.

Micrositus levis, Perez Arcas, briefly redescribed and figured by the author, An. Soc. Esp. i. p. 107, pl. 1. fig. 3.

Micrositus nitidicollis, sp. n., *id. ibid.* pl. 1. fig. 4, Mallorca (? type of a new genus).

Hopatrides.

Trichosternum, Woll., = *Trichopodus*, Muls.: F. Bates, *l. c.* p. 98.

Gonocephalum puberulum, p. 187, note, *irroratum*, p. 188, note, Lifu, spp. nn., Fauvel, Bull. Soc. L. Norm. (2) i.

Hopatrum mastersi, sp. n., W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 277, Gayndah.

Apatelus squamosus, sp. n., *id. l. c.* p. 278, Gayndah.

Cestrinus squalidus, sp. n., *id. ibid.*, Gayndah.

Trachyscelides.

Hyocis pallida, p. 278, *pubescens*, p. 279, *id. l. c.*, Gayndah: spp. nn.

Bolitophagides.

Mychestes pascoii and *mastersi*, spp. nn., *id. l. c.* p. 279, Gayndah.

Diaperides.

Diaperis picta, Mén., *Neomida ead.*, Fald., *Platydema id.* Gemm. & v. H. Cat., = *Phyletus populi*, Redt., = *Alphitophagus 4-pustulatus*, Steph.: W. F. Mäklin, S. E. Z. xxxiii. p. 247.

Tetraphyllus, Cast., removed by Lacordaire to the *Cnodalonides*, is restored to the *Diaperides*: id. *l. c.* p. 248.

Acanthosternus, Montrouz., ? = *Diphyrrhynchus*, Fairm.: F. Bates, Ent. M. M. ix. p. 97.

Heterochira, Dej., placed by Lacordaire in the *Ulomides*, is really to be referred here, near *Diphyrrhynchus*, Fairm.: F. Bates, Tr. E. Soc. 1872, p. 266.

[*H*] *Oplocephala iris*, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 189, note, Lifu.

Platydema pascoii and *laticolle*, spp. nn., W. Macleay, *l. c.* p. 280, Gayndah.

Diphyrrhynchus ovalis, caledonicus, p. 268, *nigrobrunneus*, p. 269, spp. nn.: F. Bates, Tr. E. Soc. 1872, New Caledonia.

Ulomides.

Aniara, Lac. F. Bates, Ent. M. M. ix. p. 98, points out that Leconte proposed the name *Eutochia* for this genus in 1862, *Aniara* being preoccupied by Hope; and that *Cenoscelis*, Woll., *Aniarus*, Gemm., and *Holaniara*, Fairm., are therefore not required. The peculiarity in the labial palpi of *Cenoscelis* is only sexual: *id. ibid.*, note.

"*Tenebrio*" *crotchi*, Woll. (*parallelus*, Dej. Cat.), is the type of a new genus (*Pelleas*, ined.) near *Ulosonia*: id. *ibid.*

Melasia tarsalis, Perroud, is from Venezuela, and wrongly joined to *Uloma* by Lacordaire and Gemminger and v. Harold: Chevrolat, CR. Ent. Belg. xv. p. xxix.

Alphitobius. F. Bates confirms Mulsant's definition of the last joint of the palpi, in opposition to Lacordaire: Tr. E. Soc. 1872, p. 267, note.

Mesotretis, g. n., F. Bates, Ent. M. M. ix. p. 151. To be provisionally placed in the group *Triboliides*, but with tarsi dilated, pulvillate beneath, and having the penultimate joint subbilobed. *M. ferruginea*, sp. n., *id. ibid.*, King George's Sound, Australia.

Aphtora, g. n., *id.* Tr. E. Soc. 1872, p. 265. *Triboliides*: allied to *Phtora*. *A. rufipes*, sp. n., *id. l. c.* p. 266, New Zealand (? = *P. lifuana*, Montr.).

Melasia brasiliana, sp. n., Chevrolat, *l. c.* p. xlvii, Brazil.

Toxicum distinctum and *parvicorne*, spp. nn., W. Macleay, *l. c.* p. 281, Gayndah.

Helœides.

Onosterrhus, Pasc., referred by its author to the *Pedinides*, should be removed to the group *Nyctozoilides* of this subfamily: F. Bates, Ent. M. M. ix. p. 98. Recharacterized, *id.* Tr. E. Soc. 1872, p. 277.

Saragodinus, g. n., F. Bates, Tr. E. Soc. 1872, p. 269. Should probably constitute a distinct subdivision; form of *Nyctozoilus*, but approaches *Saragus*. *S. duboulayi*, p. 272, *howitti*, p. 273, Champion Bay, W. Australia: *id. l. c.*, spp. nn.

Hypocilibe, g. n., *id. l. c.* p. 274. Differs from *Nyctozoilus* in having the gula deeply transversely sulcate, &c. *H. macleayi*, sp. n., *id. l. c.* p. 276, Australia.

Pterohelæus bremii, p. 281, *elongatus*, *pascoii*, p. 282, *confusus*, p. 283: W. Macleay, *l. c.*, Gayndah, spp. nn.

Saragus ovalis, sp. n., *id. l. c.* p. 283, Gayndah.

Nyctozoilus mastersi and *elongatulus*, id. *l. c.* p. 284, Gayndah; *N. reticulatus*, F. Bates, Tr. E. Soc. 1872, p. 274, N. S. Wales: spp. nn.

Onosterrhus marginicollis, p. 277 (? sexual form of *O. lævis*, Pasc.), *opacus*, p. 278, W. Australia: *id. l. c.*, spp. nn.

Tenebrionides.

Motschoulsky's 'Enumérations' &c. are continued after his death in Bull. Mosc. xlv. 2; pp. 23–42 being devoted to the *Tenebrionides* and *Calcarides*. The genera of the former are thus grouped:—*Milaris*, Pall. (type *Upis maxima*, Erm.), *Deriles*, Mots. (type *U. excavata*, Hbst.), *Pediris*, Mots., *Iphthimus*, Truqui, *Setenis*, Mots. (type *Tenebrio valgus*, Wied.), *Mederis*, Mots. (type *Upis angulata*, Er.), *Asiris*, Mots., *Nyctobates*, Guér., *Alobates*, Mots. (type *Tenebrio pennsylvanicus*, Deg.), *Tænobates*, Mots. (type *Tenebrio saperdoides*, Ol.), *Upis*, F., *Nuptis*, Mots., *Notiolesthus*, Mots. (type *natalensis*, M.), *Encyalesthus*, Mots. (type *subviolaceus*, M.), *Augolesthus*, Mots., *Menechides*, Mots. (type *Helops calcaratus*), *Zophobas*, Deg., *Lobetas*, Mots. (type *Tenebrio costatus*, Guér.), *Rophobas*, Mots., *Menephilus*, Muls., *Tenebrio*, L., *Menedrio*, Mots. (type *Tenebrio obscurus*). The genera of *Calcarides* are thus grouped:—*Calcar*, Dej., *Centorus*, Muls., *Biomorphus*, Mots., *Bius*, Dej., *Dysmastes*, Mann., *Boros*, Hbst., *Boromorphus*, Mots. (type *Boros tagenioides*, Luc.), *Meglyphus*, Mots., *Aspi[do]cephalus*, Mots. (type *A. desertus*, Mots., note, p. 42). The salient characters of all these genera are given briefly in a table; and it is probable that at least such of them as are attributed to this author, and have no type mentioned in the above notice, are intended to be described as new; but the usual indications of such an intention are not given. The following species are treated in the same way, and may possibly be new:—*Milaris attenuaticollis*, tropical America, *cayennensis*, Guiana, Surinam, p. 27, *Setenis rectangula*, E. India, p. 28, *puncticollis*, Java, *punctatistriata*, West Indies, Assam, *transversicollis*, E. India, Java, p. 29, *impressa*, E. India, Java, *crenatistriata*, E. India, Birma, p. 30, *Nyctobates glabriculus*, p. 31, *subrobustus*, p. 32, E. India, *Upis crenipennis*, p. 32, E. India, *Encyalesthus brevipennis*, p. 33, E. India, *Zophobas submitidus*, p. 35, *laticollis*, p. 36, Amazons, *Menephilus indicus*, E. India, *capensis*, C. of G. Hope, *longipennis*, N. America, *longicollis*, Russian Georgia, p. 37, *Centorus tenuicornis*, Lenkoran, *americanus* [sic], Armenia, *filiformis*, Kirghese desert, p. 40, *Borocus sibiricus*, p. 41, Siberia. If these, or some of them, be not new, the reference to the author's characters for them may yet be of use. The descriptions of the author's species recorded *infrà* as new are longer than any of these; but none are stated to be new (beyond the inference from the title).

Everestus, F. Bates, = *Rhinandrus*, Lec., and *E. jansoni*, F. B., ? = *elongatus*, Horn; *Iphthimus cancellatus*, Montr., belongs to *Dechius*, Pasc., and *Nyctobates orcus*, Pasc., to *Hypaulax*, F. B.; *Adelina plana*, Lec., belongs to *Doliema*, Pasc. (which is near *Sitophagus*, Muls.); and, if *plana*, Fab., be also a *Doliema*, Leconte's sp. will require renaming; *Sitophagus solieri*, Muls., and

? *Adelina farinaria*, Woll., = *Hypogena complanata*, Dej. Cat.: F. Bates, Ent. M. M. ix. pp. 98 & 99.

Ephidonius, Pasc., recharacterized: *id.* Tr. E. Soc. 1872, p. 279.

Microphyes, g. n., W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 286. Of broad, oval, subdepressed form; in other respects approaching *Tenebrio*. *M. rufipes*, sp. n., *id. ibid.*, Gayndah.

New species :—

Hypaulax gayndahensis, p. 284, *opacicollis*, p. 285, *id. l. c.*, Gayndah.
Promethis pascoii, id. *ibid.*, Gayndah.
Menephilus (?) *parvulus*, id. *ibid.*, Gayndah.
Ephidonius duboulayi, F. Bates, *l. c.* p. 279, W. Australia.
Pediris longipes, Motschoulsky, Bull. Mosc. xlv. 2, p. 28, Sonda I., Sumatra.
Asiris angulicollis, p. 30, New Holland, Van Diemen's Land, *natalensis*, p. 31, Pt. Natal: *id. l. c.*
Nuptis tenuis, id. *l. c.* p. 32, Nicaragua.
Notiolesthus natalensis, id. *l. c.* p. 33, Pt. Natal.
Augolesthus purpureifasciatus, p. 34, E. India, *australasiæ*, p. 35, north of New Holland: *id. l. c.*
Rhophobas asperatus, id. *l. c.* p. 36, E. India.
Biomorphus tuberculatus, id. *l. c.* p. 40, California.
Megliphus lænoides, id. *l. c.* p. 41, Cape of Good Hope.

Heterotarsides.

Ancylopoma, Pasc., should be referred to this group, next after *Anædus*, Blanch.: F. Bates, Ent. M. M. ix. p. 97.

Cyphaleides.

Cyphaleus chalybeipennis, p. 286, *cupreicollis*, p. 287, spp. nn.: W. Macleay, *l. c.*, Gayndah.
Prophanes westwoodi, sp. n., *id. l. c.* p. 287, Gayndah.
Chartopteryx mastersi, sp. n., *id. ibid.*, Gayndah.

Cnodalonides.

Scotæus, Hope, and *Eucyrtus*, Pascoe, are absolutely distinct; *Strongylium æneum* and *mulsanti*, Montr., form a new genus near *Titæna*, Er.: F. Bates, Ent. M. M. ix. p. 99.

Psydus, Pasc., does not belong to the *Strongyliides*, but to this group, very near *Thecacerus*, Lac.: W. F. Mäklin, S. E. Z. xxxiii. p. 248. *Damatris*, Cast., also belongs here: *id. l. c.* p. 249.

Helopides.

Adelium triste, Montr., belongs to *Arcothymus*, Pasc.: F. Bates, *l. c.* p. 99.

Leptogastrus, g. n., W. Macleay, *l. c.* p. 293. Perhaps nearest to *Licinoma*, Pasc.; resembles *Adelium* in some characters, but separated from all the

group by its elongate form, pedunculated body, and clavate antennæ. *L. mastersi*, sp. n., *id. l. c.* p. 294, Gayndah.

Atryphodes opacicollis and *mastersi*, spp. nn., *id. l. c.* p. 288, Gayndah.

Adelium viridipenne, rugosicolle, convexiusculum, p. 289, *parvulum, panagæicolle*[!], p. 290, *monilicorne*, p. 291, spp. nn.: *id. l. c.*, Gayndah.

Seirotrana punctifera, p. 291, *femoralis*, p. 292, spp. nn.: *id. l. c.*, Gayndah.

Coripera mastersi, sp. n., *id. l. c.* p. 292, Gayndah.

Licinoma violacea, sp. n., *id. ibid.*, Gayndah.

Brycopia longipes and *B.* (?) *dubia*, spp. nn., *id. l. c.* p. 293, Gayndah.

Omolipus grandis, sp. n., *id. l. c.* p. 294, Gayndah.

Nephodes barbarus, sp. n., Reitter, B. E. Z. xvi. p. 182, Oran (= *villiger*, Rosenh., which is not the same as *metallescens*: Kraatz, *ibid.*).

Amarygmides.

Amarygmus aheneus, De Haan, of colls., = *Dictysus* (not *Dietysus*) *lucidus*, De Brême, with which *D. confusus*, Pasc., is probably identical: W. F. Mäklin, S. E. Z. xxxiii. p. 249.

Amarygmus rufipes, p. 294, *picipes, opacicollis, grandis, rugosicollis*, p. 295, *punctipennis, obsoletus, rugosipennis*, p. 296, *foveolatus, striatus, convexiusculus*, p. 297: W. Macleay, *l. c.*, Gayndah, spp. nn.

Strongyliides.

Odontopus physodes (? = *Lagria æruginea*, Gerst.) and *asperatus*, Pasc., belong to *Aspidosternum*, Mäkl.; *O. speciosus*, Pasc., = *A. cyaneum*, Mäkl.; *Strongylium viridipenne*, Montr., is very near, if not identical with, *Chariotheca*, Pasc.: F. Bates, Ent. M. M. ix. p. 99.

Strongylium mastersi and *ruficolle*, spp. nn., W. Macleay, *l. c.* p. 298, Gayndah.

Stenochia deplanchii, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 190, note, New Caledonia.

CISTELIDÆ.

Cistela costassii, Bertol. Fully redescribed by the author, from the Valle di Sole, Trentino: Bull. Ent. Ital. iv. p. 115.

Apellatus palpalis, p. 298, *mastersi*, p. 299: W. Macleay, Tr. Ent. Soc. N. S. W. ii., Gayndah, spp. nn.

Metistete pascoii, sp. n., *id. l. c.* p. 299, Gayndah.

Atractus ruficollis, cyaneus, ibid., *vitticollis, rugosulus*, p. 300: *id. l. c.*, Gayndah, spp. nn.

Chromomæa mastersi and *picea*, spp. nn., *id. l. c.* p. 300, Gayndah.

Homotrysis ruficornis, subgeminatus, regularis, spp. nn.: *id. l. c.* p. 301, Gayndah.

Allecula elongata, ibid., *subsulcata, punctipennis, pascoii, mastersi*, p. 302, *planicollis*, p. 303: *id. l. c.*, Gayndah, spp. nn.

Cistela convexa, ovata, depressiuscula, p. 303, *polita*, p. 304: *id. l. c.*, Gayndah, spp. nn.

Homophlus menticornis, p. 172, *oranensis*, p. 173, *kirschi*, p. 174, Oran: Reitter, B. E. Z. xvi., spp. nn.

Monommatidæ.

Monomma. Table of the 21 known species, with localities &c., by Gestro, Ann. Mus. Genov. iii. p. 52.

Monomma abyssinicum, p. 50, *antinorii*, p. 51, Bogos, *doriæ*, p. 51, Sarawak: *id. l. c.*, spp. nn.

Melandryidæ.

Serropalpus striatus. A. Müller, P. E. Soc. 1872, p. x, notices the occurrence and habits of this insect at Basle, in connexion with timber-rafts. He quotes and confirms the Recorder's opinion that the name *barbatus*, Schall., should stand for it. Bremi-Wolf & Stierlin adopt this, though Schaum did not. From an editorial note in C. H. x., it would appear that the last-named author had no other ground for his opinion but his inveterate dislike to alter any received name.

J. Erné, MT. schw. ent. Ges. iii. pp. 525–530, pl., describes the economy of this species, giving rough figures of its various stages. It appears to be a destructive insect, its larva attacking growing or recently dead fir trees, and being commonly known at Mülhausen as the "black worm."

Dæmon, g. n., Motschoulsky, Bull. Mosc. xlv. 2, p. 44. Anterior coxæ contiguous, hooks of tarsi simple. *D. testaceus* and *suturalis*, spp. nn., *id. l. c.* p. 45, Cape of G. Hope.

Eustrophus ochraceus, sp. n., *id. l. c.* p. 42, Brazil.

Orchesia gravida, id. *ibid.*, Atlanta, American Georgia; *O. elongata*, W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 304, Gayndah: spp. nn.

Hallomenus variegatus, p. 42, Caucasian Alps, *reticulatus*, p. 43, Atlanta: Motschoulsky, *l. c.*, spp. nn.

Xylita umbrata, Pennsylvania, *robusta*, E. Siberia: *id. l. c.* p. 43, spp. nn.

Dircæa fusca, sp. n., *id. l. c.* p. 44, California.

Emmesa californica, sp. n., *id. l. c.* p. 45, pl. 2. fig. 10, California.

Melandrya alternans, sp. n., *id. ibid.*, E. Siberia.

Scotodes uniformis, sp. n., *id. l. c.* p. 46, Kamschatka.

Lagriidæ.

Ommatophorus [*Ommatophora*, Brandt, *Myriopoda*], g. n., W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 304; ? rightly placed here, according to the author, who gives no differential characters. *O. mastersi*, sp. n., *id. l. c.*, p. 305, Gayndah.

Lagria cyanea, sp. n., *id. l. c.* p. 304, Gayndah.

Pedilidæ.

Anidorus, Muls. & R. The elytra of the ♂ have a small spine on the posterior discal declivity: Abeille, Étud. Col. Cav. p. 37.

Xylophilus patricius, sp. n., *id. ibid.*, Sos.

Anthicidæ.

Anthicus. Sexual characters used by Thomson referred to, and an un-

described French species, near *antherinus*, noted: Ch. Brisout, Bull. Soc. Ent. Fr. (5) ii. p. xxv.

Mecynotarsus kingi and *mastersi*, spp. nn., W. Macleay, Tr. Ent. Soc. N. S. W. ii. p. 305, Gayndah.

Formicomus kingi and *humeralis*, spp. nn., *id. l. c.* p. 306, Gayndah.

Anthicus kingi, ibid., *propinquus*, *laticollis*, *mastersi*, *constrictus*, *pallidus*, p. 307, and *A.* (?) *aberrans*, p. 308, *id. l. c.*, Gayndah; *A. scoticus*, Rye, Ent. M. M. ix. p. 10, Scotland: spp. nn.

Pyrochroidæ.

Lemodes mastersi, sp. n., W. Macleay, *l. c.* p. 308, Gayndah.

Mordellidæ.

Anaspis maculata bred from large woody excrescences on birch: A. Müller, P. E. Soc. 1872, p. xviii.

Mordella quadriguttulata, Motschoulsky, Bull. Mosc. xlv. 2, p. 46, South Daouria; *M. octomaculata*, 14-*maculata*, p. 308, *aterrima*, *brunneipennis*, *cuspidata* [descriptions utterly inadequate], p. 309, W. Macleay, *l. c.*, Gayndah: spp. nn.

Rhipidophoridæ.

Trigonodera gerstæckeri, p. 309, *mastersi*, p. 310, spp. nn.: W. Macleay, *l. c.*, Gayndah.

Ptilophorus gerstæckeri, sp. n., *id. l. c.*, p. 310, Gayndah.

Rhipidophorus luteipennis, sp. n., *id. ibid.*, Gayndah.

Rhipidius quadriceps, sp. n., Abeille, Étud. Col. Cav. p. 36, Isère (? parasitic on a small yellow *Blatta*).

Stylopidæ.

Sir S. S. Saunders, Tr. E. Soc. 1872, pp. 1–48, pl. vii., has published an exhaustive account of this group, under the title "Stylopidarum, *ordinem* Strepsipterorum Kirbii *constituentium*, *mihi tamen potius* Coleopterorum *Familiæ*, Rhipiphoridis Meloidisque *propinquæ*, *Monographia*." At p. 287 is a list of numerous corrections &c., and at p. 288 an explanation of the accompanying plate, on which the various portions of the wing of a *Stylops* are indicated, and the wings of *Myrmecolax nietneri*, *Xenus rossii*, and *Hylechthrus rubi* figured, besides portions of the species described as new.

Basing his classification on the species upon which the various members of the group are parasitic, the author forms the family into two divisions:—1. Hymenopteroblæ, comprising as subfamilies the *Stylopides* (parasitic on bees), *Myrmecolacides* (on ants), *Xenides* (on social wasps), and *Pseudoxenides* (on solitary wasps and *Fossores*); 2. Homopteroblæ, founded on a parasite on one of the *Fulgoridæ*, and to be described hereafter by Westwood. Useful tables of the infested species &c. are given; and the following new genera and species described in the *Pseudoxenides*:—

Pseudoxenos[*-nus*], p. 44. Antennæ and tarsi 4-jointed; branches of the former "tæniæform," basal cubitus of 3rd joint subrotundate; insulated apical

nerve of wings double, discoidal nerve simple. *P. schaumi*, ibid. pl. vii. figs. 6-9, Corfu, parasitic on *Odynerus parietum*; and *P. heydeni* and *klugi*, Saund.

Paraxenos[*-nus*], p. 45. Branches of antennæ distorted, swollen; basal cubitus of 3rd joint rather prominent, rectangularly recurved; both alar nerves double. *P. erberi*, pl. vii. figs. 5 & 13–15, parasitic on *Larra peregrina*, and *P. corcyricus*, on *Odynerus spinipes*, Corfu, p. 46; also *Xenus sphecidarum*, Duf. (wrongly renamed *sieboldi*, because other species are parasitic on members of the *Sphegidæ*), and *X. westwoodi*, Templeton.

Cantharidæ.

Meloides.

Meloe. Motschoulsky, Bull. Mosc. xlv. 2, p. 48, indicates and names, without fully describing, the following species as new:—*M. strigosa*, Kamschatka (?=*violacea*, var.), *prolifericornis*, Georgia, *sculpticornis*, Nicaragua, *opaca*, tropical America.

Meloe cyanea, Muls., referred with some reserve to Britain: E. C. Rye, Ent. M. M. viii. p. 248. Further British locality for the insect mentioned, by C. G. Rotheram-Webdale, *ibid.* p. 288. Connecting links between it and *M. proscarabæus* recorded from the Isle of Man by Rye, *ibid.*

Meloe maculifrons and ? *maculicollis*, Luc., = *majalis*, varr.: Reitter, B. E. Z. xvi. p. 176.

Meloetyphlus, g. n., C. O. Waterhouse, Ent. M. M. ix. p. 31. Eyeless. *M. fuscatus*, sp. n., *id. l. c.* p. 32, E. Peru.

Meloe puncticollis, p. 46, Siberia, *granulifera*, p. 47, E. Siberia, spp. nn.: Motschoulsky, *l. c.*

Mylabrides.

Mylabris variabilis. A pair observed digging holes in the ground, near Carcassonne, by Gavoy, probably for some purpose connected with ovipositing. Nouv. et Faits, p. cli.

Ceracoma. Table of species: Motschoulsky, Bull. Mosc. xlv. 2, p. 49.

Mylabris axillaris, flavipennis, brevicornis, id. *l. c.* p. 50, Dauria; *M. sanguinosa*, Marseul, L'Ab. viii. p. 417, Persia: spp. nn.

Coryna dolens, p. 417, Syria, *denticulata*, p. 418, Arabia: Marseul, *l. c.*, spp. nn.

Deratus tibialis, sp. n., Motschoulsky, *l. c.* p. 51, Dauria.

Rhampholyssa batesi, sp. n., Marseul, *l. c.* p. 416, Arabia.

Cantharides.

Epicauta and *Lytta.* New species are found in every fresh region; each kind of *Astragalus* having its accompanying Vesicant: Horn, in Hayden's Geol. Surv. of Montana, p. 384.

Zonites. Table of species, Motschoulsky, *l. c.* pp. 52 & 53.

Lydus stigmatifrons, sp. n., Marseul, *l. c.* p. 419, Syria.

Zonites lutea, fuscicornis, p. 310, *apicalis, bizonata, annulata*, p. 311: W. Macleay, Tr. Ent. Soc. N. S. W. ii., Gayndah, spp. nn.

Sitarides.

Sitaris taurica, sp. n., Motschoulsky, *l. c.* p. 54, Tauris.

Nematognathides.

Nem[*at*]*ognatha asiatica*, sp. n., *id. ibid.*, Teheran.

Œdemeridæ.

Œdechira [*Œdechirus*, Er.], g. n., Motschoulsky, Bull. Mosc. xlv. 2, p. 54. Allied to *Lethonymus*; distinguished from *Œdemera* by its swollen anterior and simple posterior femora. *Œdemera paradoxa*, Fald. (not in same genus as *Anoncodes adusta*, Pz., as Mulsant states); *Œ. flavipennis*, sp. n., Motschoulsky, *l. c.* p. 55, Caucasus.

Selenopalpus (?) *fuscus*, p. 311, *mastersi*, p. 312: W. Macleay, Tr. Ent. Soc. N. S. W. ii., Gayndah, spp. nn.

Anonca vitticollis and *ruficollis*, spp. nn., *id. l. c.* p. 312, Gayndah.

Pseudolychus apicalis, sp. n., *id. l. c.* p. 313, Gayndah.

Chrysanthia superba, sp. n., Reitter, B. E. Z. xvi. p. 182, Oran (also from Sierra de Jaen, *teste* Kraatz, *ibid.*).

Curculionidæ.

Suffrian, Arch. f. Nat. xxxviii. pp. 156–207, continues his enumeration of the species found by Dr. Gundlach in Cuba, with descriptions of new species (many named by Chevrolat) of *Hylobiides*, *Derelomides*, *Ithyporides*, and *Cryptorhynchides*. Observations are made upon various insects already described by Schönherr, Lacordaire, and others.

Brachyderides.

Cneorhinus hypocyanus, Boh., redescribed and figured: Perez Arcas, An. Soc. Esp. i. p. 110, pl. 2. fig. 3.

Liophlæus geminatus, Sch., and *L. opacus*, Chevr., *exx. typp.*, = *nubilus*, varr.; *L. atricornis*, Desbr., is a distinct species: Bedel, Bull. Soc. Ent. Fr. (5) ii. p. l.

Sitones cribricollis, Schön. [1834], is identified with and adopted for *S. cambricus*, Steph. [1831]; *S. punctiger*, Thoms., = *puncticollis*, Kby.: Thomson, Opusc. Ent. (iv.) p. 390. *S. biseriatus*, All., = *discoideus*, Gyll.; *S. niger*, All., = *ellipticus*, All., abraded; *S. tibialis*, *ambiguus*, and *brevicollis* are not specifically distinct, nor are *lineatus* and *geniculatus*; *S. puncticollis* should be placed near *flavescens*; and a var. of *S. chloroloma*, with almost black legs, is recorded. Desbrochers, Ann. Soc. Ent. Fr. (5) ii. pp. 420 & 421.

Eusomus smaragdinus, Fairm., ? = *Polydrosus salsicola*, var., *id. l. c.* p. 428. *P. arvernicus* is very distinct from *melanostictus*, according to Chevrolat: *id.* Bull. Soc. Ent. Fr. (5) ii. p. xxiii.

Thylacites tessellatus, Gyll. Perez Arcas, *l. c.* p. 118, demurs to Desbrochers's opinion that *T. turbatus* and *glabratus*, Gyll., are synonyms of this species, and suggests the identity of *turbatus* with *fullo*, Er.

Amomphus concinnus, Küst., = *westringi*, Sch., *ex. typ.*: Desbrochers, *l. c.*

p. 427 [who nevertheless does not himself hesitate to describe as a new species an insect which he is constrained to query as var. ♀ of *westringi*!]

Tanymecus femoralis, Desbr.,=*metallinus*, Fairm.; *T. congener*, Desbr., ?=*persulcatus*, Fairm.; *T. araneiformis* and *insidiosus* are distinct: Fairmaire, Ann. Soc. Ent. Fr. (5) ii. p. 48.

Psalidium pactolum, Rche., = *forcipatum*, Rche., ♀: Desbrochers, *l. c.* p. 427.

Leptolepurus [rectius *-porus*], g. n., *id. l. c.* p. 424. Follows *Cneorhinus*. *L. olivieri*, sp. n., *id. l. c.* p. 425, Bone.

Ottistira, g. n., Pascoe, J. L. S. xi. p. 440. Near *Sciaphilus*; scrobes transverse, running far beneath the eyes, with a longitudinal abbreviated furrow in front; elytra much wider than thorax at base; anterior coxæ not contiguous (*Pachyrhynchides*, Lac.). *O. bispinosa*, ibid. pl. x. fig. 6, Dorey, *bicornis*, New Guinea, *planidorsis*, Batchian, *ocularis*, Singapore, *pulchella*, Morty, p. 441, *leucogenys*, Sula, *gibbosa*, Malacca, *naso*, Flores, *punctata*, Tondano, p. 442: *id. l. c.*, spp. nn.

Cneorhinus spinipes, sp. n., Perez Arcas, *l. c.* p. 112, pl. 2. fig. 1, Salamanca.

Strophosomus palearius, id. *l. c.* p. 132, pl. 3. fig. 1, Arragon; *S. puberulus*, p. 409, *aureolus*, *canus*, p. 410, Chevrolat, Ann. Soc. Ent. Fr. (5) ii., Spain; *S.* (*Neliocarus*) *seidlitzi*, Reitter, B. E. Z. xvi. p. 183, Frendah: spp. nn.

Polydrosus juniperi, sp. n., Desbrochers, *l. c.* p. 421, Ajaccio.

Thylacites emarginatus, id. *l. c.* p. 422, Portugal; *T. planicollis*, p. 114, pl. 2. fig. 2, *elongatus*, p. 117, fig. 4, Cordova: Perez Arcas, *l. c.*, spp. nn.

Amomphus dissimilis, sp. n., Desbrochers, *l. c.* p. 422, Carthagena (?=*scestringi*, Sch., ♀ var. *sec.* Desbr.).

Tanymecus zuberi, sp. n., *id. ibid.*, Astracan.

Chlorophanus crotchi, Imeritia, *nitidulus*, Sarepta, p. 423, *separandus*, p. 424, Russia, *id. l. c.*: spp. nn.

Otiorhynchides.

De Marseul (L'Ab. viii. pp. 1–104, separate pagination) has commenced a monograph of this group, founded on the works of Seidlitz and Stierlin. The part published discusses the genera *Holcorhinus*, *Cyclomaurus*, *Mylacus*, *Cyclopterus*, *Peritelus*, *Cænopsis*, and the commencement of *Otiorhynchus*. The following observations occur (the changes of nomenclature being apparently based on the grounds stated in Zool. Rec. viii. p. 209):—*Holcorhinus pilosulus*, Chevr., *ex. typ.*,=*querulus*, Boh., ♀, with which species *H. albimarginatus*, Luc., is probably identical; *Cyclomaurus punctatus*, All., ? = *H. parvicollis*, Seidl. (renamed *parvulicollis*); *C. velutinus*, Fairm., is renamed *fairmarii*; *C. piceus*, All.,=*metallescens*, Luc.; *Mylacus murinus*, Boh., is renamed *soricinus*; *M. puberulus*, Sch.,=*rotundatus*, F.; *M. hæmatopus*, Rosenh., is renamed *rubripes*; *M. armatus*, Seidl., is renamed *armipotens*; *Myllocerus hispanus*, Chevr.,=*Peritelus gougeleti*, Seidl.; *P. kiesenwetteri*, Seidl., is renamed *hispalensis*; *P. prolixus* is renamed *promissus*; *P. siculus*, Seidl., =*subdepressus*, Muls., var.; *P. rudis*, Boh.,=*brucki*, Seidl., ♂ [which latter name should therefore apparently sink]; *P. parvulus*, Seidl., is renamed *italicus*; *P.* (*Cathormiocerus*) *squamulatus*, Rche., is renamed *squamans*; *P. crassicornis*, Duv., is renamed *crassulicornis*; *Meira elongatula*, Fairm., and ?*Otiorh. minimus*, Stierl.,=*P. suturellus*, Fairm.; *P. aquilus*, Seidl., *nec* Chevr.,=*mu-*

ricatus, Chevr.; *Otiorhynchus furinus* and *gracilis*, Chevr., = *P. aquila*, Chevr. (*-lus*; *cf.* v. Harold, C. H. x. p. 220). v. HAROLD, C. H. x. pp. 214 & 220, in some strictures upon the above changes, notes that *O. elongatus*, Stierl., *nec* Hoch., was in 1867 altered by its author to *francolinus*, and that *O. glabratus*, Stierl., *nec* Kryn., and *tristis*, Stierl., *nec* Scop., have been passed over.

Otiorhynchus. STIERLIN, B. E. Z. xvi. pp. 321–368, has published a 3rd supplement to his revision of the European species, giving a new systematic list. *O. rotundatus*, Sieb., is redescribed, and (p. 344) stated to be *impariidentatus*, Hochhuth; fresh divisional characters are pointed out and alterations of position made; *O. lefeburii*, Gyll., = *aurifer*, Sch., var.; *multipunctatus*, F., is specifically distinct from *irritans*, Germ., and is now placed in another subgenus; *francolinus*, Schauf., is adopted for *elongatus*, Hoch.; *pubens*, Sch., is very variable [in Stierlin's original Revision this name is altered in the errata to *pubeus*, but now rightly stands again as *pubens*]; *lutosus*, Stl., = *pseudomias*, Hoch.; *incivilis* ["Germ." in text, "Gyll." in list; ? = "*inclivis*, Sch.," of original revision, p. 334] comes next to *compressus*, Stl.; a Lapland var. of *politus* is referred to as *borealis*; the species allied to *rugifrons* are tabulated, p. 343; *rutilipes*, Hoch., is doubtfully distinct from *cribrosicollis*, Sch. [the latter name occurs in two different places in the list, p. 367, the first time apparently in error for *cribricollis*]; *chrysopterus*, Stl., = *scopularis*, Hoch.; *crucirostris*, Hoch., = *ovalipennis*, Sch.; *puberulus*, Hoch., is not an *Otiorhynchus*, but possibly a *Phyllobius* or *Chiloneus*; *angustior*, Rosenh., *ex. typ.*, is erroneously stated by v. Harold to be = syn. of *carmagnolæ*, Stl.; the subgenus *Eurychirus* is tabulated, p. 345, as is the 3rd group of *Tournieria*, p. 347; *O. reynosæ*, Ch. Bris., = *hispanus*, var.; *O. sylvestris*, Chevr., *ex. typ.*, = *jugicola*, Stl.; *O. tenuicornis*, Mill., is extremely close to *eremicola*; *O. egregius*, Mill., = *kratteri* [? *krattereri*], Sch., var.; the diagnosis of all species published since the original Revision are reproduced, with comments.

Otiorhynchus agrosicollis, Boh., new to France: Ch. Brisout, Bull. Soc. Ent. Fr. (5) ii. p. xlvii.

Cneorhinus cæsifrons, Desbr., is a *Holcorhinus*, and very probably = *seriehispidus*, Boh., ♀: Desbrochers, Ann. Soc. Ent. Fr. (5) ii. p. 428.

Peritelus gougeleti, Seidl., has priority over *hispanicus*, Chevr., the reference by Desbrochers [Zool. Rec. viii. p. 300] being erroneous. De Marseul, Nouv. et Faits, p. cxxxix.

Trachyphlœus scaber, Redt., = *alternans*, Sch.: Thomson, Opusc. Ent. (iv.) p. 391.

Pholicodes lepidopterus and *inauratus*, Boh., are presumably sexes of one species; *P. tristis*, Mots., *ex. typ.*, = *trivialis*, Sch.; *P. murinus*, Mars., *nec* Boh., is referred to: Desbrochers, *l. c.*

New genera and species :—

Cyrtomezia, Pascoe, J. L. S. xi. p. 443. Allied to *Laparocerus*, but with widely separated posterior coxæ, a longer metasternum, the basal groove of rostrum transverse, and short foveiform scrobes. *C. dispar*, id. *ibid.* pl. x. fig. 9, Bombay.

Psidiopsis, id. *ibid.* Agrees in most respects with *Otiorhynchus*, but with

posterior coxæ approximated, scape thickened only at the tip, and cylindrical thorax. *P. filicornis*, id. *l. c.* p. 444, Amazons.

Telenica, id. *l. c.* p. 444. Between *Merimnetes* and *Myllocerus*, having rostrum of the former and the free claws of the latter; scape straight, no humeral angle to elytra. *T. sublimbata* and *nebulosa*, id. *l. c.* p. 445, W. Australia.

Onychopoma, id. *l. c.* p. 445. Allied to *Drepanoderes*, but with arched, dilated, and flattened scape, and rounded eyes. *O. parda*, id. *ibid.* pl. x. fig. 8, Cochin China, Pegu.

Timareta, id. *ibid.* Between *Trachyphlœus* and *Asceparnus*, differing in the form of its posterior tarsi [? tibiæ]. *T. figurata* (pl. xii. fig. 8) and *satellina*, id. *l. c.* p. 446, Freemantle, Swan River.

Otiorhynchus amputatus, Nouv. et Faits, p. cxxxii, *gossipiipes*, Ann. Soc. Ent. Fr. (5) ii. p. 410, Chevrolat, Spain; *O. caucasicus*, p. 321, Caucasus, *spoliatus*, p. 322, Silesia, *subdepressus*, p. 323, locality unknown, *coronatus*, p. 324, *cribratistriatus*, p. 326, Greece, *seriehispidus*, p. 325, Neufchatel, *dieki*, Upper Italy, *irregularis*, ? Greece, p. 327, *caunicus*, p. 336, Spain, *delicatulus*, p. 337, Maritime Alps; *O.* (*Eurychirus*) *villosus*, p. 329, *hellenicus*, *gravidus*, p. 330, *messenicus*, p. 332, Greece, *anniboli* [? *annibali*], p. 331, Syria, *ponticus*, p. 333, Pontic Alps, *allardi*, p. 334, Algiers, *paradoxus*, p. 338, ? Syria, *marseuli*, p. 339, locality unknown; *O.* (*Tournieria*) *longipes*, p. 335, Gurien; *O.* (*Stomodes*) *angustatus*, p. 335, Greece: Stierlin, *l. c.*

Holcorhinus conglobatus, Marseul, *l. c.* p. 14, Algeria.

Peritelus globulicollis and *hybridus*, p. 61, Spain, *curticollis*, p. 86, *hamatus*, p. 91, Corsica: *id. l. c.*

Barypithes rhytidiceps, Chevrolat, *l. c.* p. 411, Spain.

Platytarsus ebeninus, id. *ibid.*, Spain.

Titinia marmorata, Pascoe, Ann. N. H. (4) ix. p. 132, N. S. Wales.

Atmesia (? better placed in *Leptopides*, teste Pascoe) *glaucina*, id. J. L. S. xi. p. 446, W. Australia.

Eremnides.

Acanthotrachelus albus, sp. n., *id. l. c.* p. 447, Malabar.

Leptopides.

Dystirus, g. n., *id. ibid.* Allied to the Australian *Leptops*, differing in its transverse prothorax, which is calloso-dilate on each side, with distinct ocular lobes, its loosely attached antennal club, and the want of a humeral projection to the elytra. *D. strumosus*, sp. n., *id. ibid.* pl. xiii. fig. 10, Mexico.

Polyphrades longipennis, sp. n., *id.* Ann. N. H. (4) ix. p. 133, S. Australia.

Cherrus aureolus, sp. n., *id. ibid.*, King George's Sound.

Stenocorynus vittatus, Night Island, Australia, *aridus*, Lizard Island, spp. nn., *id. l. c.* p. 134.

Entimus arrogans, sp. n., *id.* J. L. S. xi. p. 448, Panama.

Brachycerides.

Brachycerus. Bedel, Nouv. et Faits, p. cxviii, restricts the Old-World species to 21, giving the following synonymy:—*B. besseri* and *lutulentus*,

Gyll., *incertus*, Desbr., *junix*, Hbst., = *sinuatus*, Ol.; *fimbriatus*, Desbr., = *orbipennis*, Rche.; *olivieri*, *insularis*, and *tauricus*, Desbr., *siculus*, Gyll., *nodulosus*, *argillosus*, and *ornatus*, Rche., = *ægyptiacus*, Ol.; *latro*, *punicanus*, and *libertinus*, Gyll., *curtulus*, Desbr., = *barbarus*, L.; *fluctiger*, Gyll., = *lateralis*, Gyll.; *pterygomalis*, *corrosus*, and *incultus*, Gyll., *serratus*, Ol., *undatus*, F., *ovatus*, Brullé, *subvariolatus*, *hispidus*, *sericeus*, *cornifrons*, and *nubilus*, Desbr., = *mauritanicus*, Ol.; *clathratus* and *recticostatus*, Desbr., = *crispatus*, Ol.; *semituberculatus*, Luc., *peninsularis*, Chevr., *raffrayi* and *parens*, Desbr., = *chevrolati*, Gyl.; *kabylianus* and *velutinus*, Desbr., = *scutellaris*, Luc.; *insignis*, Mill., *vespertilio* and *scutipennis*, Desbr., *plicatus*, Gyl.,=*tetanicus*, Luc.; *pradieri*, Fairm., *peninsularis*, Chevr., pt.,=*europæus*, Thunb.; *planirostris* and ? *cirrosus* and *perodiosus*, Gyll., *semiæneus*, Desbr., = *algirus*, F.; *foveicollis*, Gyll., *ventralis*, Desbr., = *muricatus*, F. For 34 of these corrections the author has the authority of authentic types. Subsequently (*ibid.* p. cli) he refers *fimbriatus*, Desbr., to *cribrarius*, Ol., *difformis*, Fald., to *sinuatus*, Ol., *pulverulentus*, Ol., to *cinereus*, Ol., and considers *europæus*, Thunb., a doubtful species. *Cf.* also *id.* Bull. Soc. Ent. Fr. (5) ii. p. l.

Brachycerus algirus, F., reared from larvæ found in cloves of garlic, the genus appearing as a rule to be attached to *Liliaceæ*: *id.* Bull. Soc. Ent. Fr. (5) ii. p. vii. Desbrochers, *ibid.* p. lxxxv.

"Tainophthalmidæ."

Desbrochers, Ann. Soc. Ent. Fr. (5) ii. p. 426, considers the erection of a separate "tribu" under the above name necessary, to follow *Brachycerus* in the European lists, comprising a new genus characterized by him as *Tainophthalmus* [*Tæniophthalmus*, on the author's own derivation], in which the rostral scrobes are not united beneath, the mandibles only slightly project and are not arched, the prothorax has no lobes, &c. *T. crotchi*, sp. n., *id. ibid.*, Astrabad.

Byrsopides.

Ixodicus, g. n., Pascoe, J. L. S. xi. p. 448. Differs from *Byrsops* in its short and stout form and rounded elytra, which are not truncate behind, smooth surface, and minute concolorous scales. *I. occlusus* (pl. xiii. fig. 8) and *sordidus*, spp. nn., *id. ibid.*, C. of G. Hope.

Amycterides.

Dohrn, S. E. Z. xxxiii. pp. 143–154, continues his digestion of the *Amycterus mirus-rabilis-rabundus* question raised in a former volume. *A. chaudoiri*, Guér., and *karelini*, Boh., are the same species, and were apparently published simultaneously.

Pascoe, Ann. N. H. (4) x. p. 91, tabulates the known genera of the short-scaped species forming Lacordaire's *Euomides*. *Phalidura scorpio*, Bois., seems the species on which Schönherr founded *Euomus*, naming it *E. fahræi* (p. 85).

Ædriodes, g. n., *id. l. c.* p. 85. Eyes small, roundish, away from the thorax, notwithstanding its ocular lobes. *Euomus nodipennis*, Boh., and *Æ. fasti-*

giatus, pl. 1. fig. 8, and *mendosus*, King George's Sound, *inuus*, W. Australia, p. 86: *id. l. c.* spp. nn.

Acherres, g. n., *id. l. c.* p. 87. No ocular lobes; rostrum short, stout, thicker towards apex, bialate, the projection running on each side above the eye. *A. mamillatus*, sp. n., *id. ibid.* pl. 1. fig. 5, W. Australia.

Ennothus, g. n., *id. ibid.* Differs from *Acherres* in its bicornute rostrum, and in having no epipleural plica to the elytra, and the last joint of the tarsi bilobed. *E. fallax*, sp. n., *id. ibid.*, W. Australia.

Oditesus, g. n., *id. l. c.* p. 88. Head subplanate in front or slightly excavated, elevated above the eyes; rostrum narrower and longer than head, elevated on the upperside at the base, and bicornute. *O. indutus*, ibid. pl. 1. fig. 6, *lycosarius*, *incænis*, *perditus*, p. 89, *sulcirostris*, *bucerus*, p. 90, King George's Sound: *id. l. c.*, spp. nn.

Sosytelus, g. n., *id. l. c.* p. 90. Rostrum short and stout, not cornuted; tarsi unusually dilated for the group. *S. lobatus*, sp. n., *id. l. c.* p. 91, pl. 1. fig. 1, Sydney.

Phalidura decipiens, sp. n., Dohrn, *l. c.* pp. 143–149 ["Soviel über *Phalidura decipiens*. Vielleicht zu viel:—" *id.* p. 149], E. Australia.

Euomus retusus, sp. n., Pascoe, J. L. S. xi. p. 449, pl. xii. fig. 12, W. Australia.

Dialeptopus serricollis, *granulatus*, and *plantaris* (pl. xii. fig. 11), *id. ibid.*, W. Australia: spp. nn.

Mythites asperatus, Sydney, *pithecius*, N. S. Wales, p. 84, *degener*, p. 85, S. Australia: Pascoe, Ann. N. H. (4) x., spp. nn.

Rhyparosomides.

Dichotrachelus manueli, Mars., fully described: L'Ab. viii. p. 413.

Geobyrsa, g. n., Pascoe, J. L. S. xi. p. 450. Resembles *Styphlus*, but with elytra at base not broader than thorax, to which they are closely applied, and antennal club shortly conical, its basal half formed of last 2 joints of funiculus. *G. nodifera*, sp. n., *id. ibid.* pl. xiii. fig. 1, Nicaragua.

Ophryota, g. n., *id. l. c.* p. 451. Allied to *Zephryne*, but stouter, antennal club closely applied to the funiculus, thorax rounded, and metasternum short. *O. squamibunda*, sp. n., *id. ibid.*, Port Augusta, S. Australia.

Cylindrorhinides.

Centyres ovis, sp. n., *id.* Ann. N. H. (4) x. 91, Pt. Dennison.

Enchymus humeralis, sp. n., *id. l. c.* p. 92, W. Australia.

Gonipterides.

Pantorites vittatus, sp. n., *id.* J. L. S. xi. p. 451, Australia.

Hyperides.

Phytonomus polygoni. Rupertsberger, Verh. z.-b. Wien, xxii. p. 14, describes all the earlier stages: the larva occurs on *Silene inflata*, and more rarely on *Dianthus deltoides*. Barrett, Ent. M. M. viii. p. 205, describes the larva from pseudo-galls on *Lychnis vespertina*.

Coniatus mimonti, Boield., is reunited on insufficient grounds to *tamarisci*; *A. deyrollii*, Cap., also =*tamarisci*, var.; *C. wenckeri*, Cap., must be reunited to *repandus*, F.; *C. saulcii* and *ægyptiacus*, Cap., are extremely close to small *tamarisci*; *C. steveni*, Cap., is probably only a simple modification of *splendidulus*, F.; *C. ionicus*, Cap., = *lætus*, Mill.; and for notes on other species, *cf.* Kirsch, B. E. Z. xvi. pp. 45 & 46.

Saginesis, g. n., Pascoe, J. L. S. xi. p. 452. Facies of *Hypera*, but with antemedian oblique scrobes, disappearing beneath the eyes, as in *Eurychirus*, from which it differs in its short legs and narrower tarsi. *S. latipennis*, sp. n., *id. ibid.* pl. x. fig. 4, Aru.

Diabathrariides.

Atelicus miniatus, sp. n., *id.* Ann. N. H. (4) ix. p. 134, Moreton Bay.

Aterpides.

Aterpus griseatus, sp. n., *id. ibid.*, Queensland.

Rhinaria foveipennis and *caliginosa*, Bombala, N. S. Wales, p. 135, *myrrhata*, S. Australia, p. 136: *id. l. c.*, spp. nn.

Cleonides.

Chevrolat gives a revised catalogue of the group, R. Z. (2) xxiii. pp. 16–18, 107–110.

Cleonus sulcirostris: Rupertsberger, Verh. z.-b. Wien, xxii. p. 18, fully describes all the earlier stages of this species, found on *Cirsium arvense*. *C.* (*Bothynoderes*) *salinus*, Gebl., *communis*, Mots., *fatuus*, Gyll.,=*foveicollis*, Esch., of which various forms are specified: J. Faust, Hor. Ent. Ross. viii. pp. 279–282.

Larinus saintpierrii, All.,=*afer*, Gyl.: Desbrochers, Ann. Soc. Ent. Fr. (5) ii. p. 427

Kraatz, B. E. Z. xvi. pp. 140–142, enumerates the Andalusian species of *Lixus* (19) and *Larinus* (19) from Capiomont's MS. *Lixus vilis*, Rossi, and *cinnabarinus*, Waltl,=*bicolor*, Ol. *Larinus reichii*, Capiom. MS., is not described, but compared with *flavescens*, Germ. *L. trivius*, Germ., Waltl, Ros., =*ursus*, F. Andalusia is probably the richest of all S. European districts in these genera. The same author, *l. c.* pp. 143 & 144, analyzes the German species: *Lixus angustatus*, F.,=*algirus*, L.; *L. sanguineus*, Rossi (*nec* Boh.), is to be used for *rufulus*, Boh.; *L. punctiventris* and *subtilis*, Boh., and *cylindricus*, F., are new to Germany. *Larinus costirostris*, Gyll.,=*cardui*, Rossi; *L. planus*, F.,=*carlinæ*, Ol.; *L. conspersus*, Boh., *cinerascens*, Stm., and *crinitus*, Boh., are to be added to the German list.

Lixus lepidii, Mots.,=*eschscholtzi*, Boh.,=*myagri*, Ol., var.: J. Faust, *l. c.* p. 282.

Larinus kirschi, Reitter, B. E. Z. xvi. p. 184, Frendah; *L. sanctæbalmæ*, Ste.-Baume (Var), Abeille, Étud. Col. Cav. p. 38: spp. nn.

Hylobiides.

Peribleptus and *Pæpalosomus*, Sch. Jekel, Ann. Soc. Ent Fr. (5) ii. pp. 433–442, reviews the position &c. of these genera, considering Lacordaire wrong in placing the former among the *Cleonides*, and suggests that the

"*Sternechiens*" of that author cannot be associated with his "*Hylobiens*" (which should assume a separate and higher rank), but, with the *Gonipterides* &c., should form a natural group among the *Isogynes*, Jek. The "*Pacholeniens*" could then, with a new genus described by him, be placed between the *Lirides* and *Hylobiides*, the latter commencing with *Pæpalosomus* and *Peribleptus*. He refers *Pæpalosomus pistriarius*, Sch., *zonatus*, Pasc., *Peribleptus* 10-*maculatus*, Chevr., and *Alcides notatus*, Blanch., to *Pæp. dealbatus*, Boisd., recording among other varr. of it, one named *niveimucosus*. *Cleonus dehaani*, Sch., is probably not a *Peribleptus*.

Paipalephorus [rectius *Pæpalophorus*], g. n., Jekel, *l. c.* p. 437. Claws united at base; funiculus apparently 6-jointed, club 4-jointed (compared with the club of the *Calandrides*): resembles *Alcides*, having elytra strongly lobed at base. *P. mucoreus*, sp. n., *id. l. c.* p. 439, Moluccas.

Cechides, g. n., Pascoe, J. L. S. xi. p. 453. Allied to *Alphitophis*, but rostrum short and thick, and scrobes distant from the eyes. *C. amœnus*, sp. n., *id. ibid.* pl. xii. fig. 7, Champion Bay, W. Australia.

Cycotida, g. n., *id. ibid.* Between *Alphitophis* and *Orthorhinus*: scales individually deeply divided into 6 or 7 hair-like branches. *C. lineata*, sp. n., *id. l. c.* p. 454, pl. xii. fig. 6, Champion Bay.

Demyrsus, g. n., *id.* Ann. N. H. (4) ix. p. 136. Facies of *Melcus*. *D. melcoides*, sp. n., *id. ibid.*, Sydney.

Sternuchus pectoralis, sp. n., Suffrian, Arch. f. Nat. xxxviii. p. 156, Cuba.

Erirhinides.

Smicronyx reichii, Gyll., new to Britain: E. C. Rye, Ent. M. M. ix. p. 11; Ent. Ann. 1873, fig. 7.

Œnochroma, g. n., Pascoe, Ann. N. H. (4) x. p. 92. Differs from *Aoplocnemis* in its scrobes not meeting beneath, and ending rather far from the eyes, in its anterior tibiæ being falcate towards the apex, and the last joints of its funiculus being transverse. *Œ. rubeta*, sp. n., *id. l. c.* p. 93, tibia figured pl. 1. fig. 18, Sydney.

Misophrice, g. n., *id. l. c.* p. 93. Funiculus 6-jointed; no claw-joint to tarsi. *M. hispida*, sp. n., *id. ibid.*, S. Australia.

Phrenozemia, g. n., *id. l. c.* p. 94. In Lacordaire's *Eugnomides*, next *Ophthalmoborus*. *P. lyproides*, sp. n., *id. l. c.* p. 95, King George's Sound.

Nemestra, g. n., Pascoe, J. L. S. xi. p. 454. Approaches *Aoplocnemis*, but with quadrangular rostrum,—a structure foreign to the group. *N. incerta*, sp. n., *id. l. c.* p. 455, pl. xii. fig. 5, W. Australia.

Nedyleda, g. n., *id. l. c.* p. 455. Allied to *Dorytomus* (not *Erirhinus*), but with anterior tibiæ straight, spurless at tip, posterior coxæ distant, and intercoxal process widely truncate. *N. semiusta*, sp. n., *id. ibid.* pl. xii. fig. 9, W. Australia.

Nychiomma, g. n., *id. l. c.* p. 456. Near *Eugnomus*; head elongate behind, and scape impinging on the eyes, which are very large and closely approximated in front. *N. testacea*, sp. n., *id. ibid.*, Sarawak.

Peliebia [altered to *Peliobia*, id. *l. c.* p. 492], g. n., *id. ibid.* Resembles *Ectinura* (*Hylobiides*), but to be placed provisionally near *Aoplocnemis*. *P. geniculata*, sp. n., *id. l. c.* p. 457, pl. xiii. fig. 3, Ecuador.

Cydmæa, g. n., *id.* Ann. N. H. (4) ix. p. 137. Habit of *Tychius*. Meso-

sternum wide; intermediate coxæ remote; basal half of rostrum striolate. *C. bimaculata, luctuosa*, p. 137, *pusilla*, p. 138, Gawler, S. Australia, *viridula, ibid.*, W. Australia, *id. l. c.*: spp. nn.

Aoplocnemis lineata, sp. n., *id. l. c.* x. p. 92, N. Australia.

Orpha persimilis, sp. n., *id. ibid.* p. 94, Sydney.

Belides.

Dicordylus luctuosus, Pasc., = *ithyceroides*, Lac., = *balteatus*, Fairm. (*Homalocerus*); *D. heilipioides*, Lac., = (*H.*) *albidivarius*, Fairm.; *D. pupillatus*, Pasc., = (*H.*) *argus*, Fairm.; *D. amœnus*, Pasc., = (*H.*) *exquisitus*, Fairm.: Fairmaire, Ann. Soc. Ent. Fr. (5) ii. p. 48. v. Harold, C. H. x. p. 217, points out that the 'Coleoptera chilensia,' for which Fairmaire claims the date of 1860, cannot confer priority for his species, not having been properly published.

Belus anguineus, p. 457, *farinarius, acicularis, parallelus*, p. 458, W. Australia, *aphthosus*, p. 457, S. Australia, Pascoe, J. L. S. xi.; *B. centralis*, id. Ann. N. H. (4) x. p. 95, pl. 1. fig. 4, S. Australia: spp. nn.

Rhinotia elytrura, p. 138, *venusta*, p. 139, Queensland, *id.* Ann. N. H. (4) ix.: spp. nn.

Cyladides.

Myrmacicelus exsertus, sp. n., *id.* Ann. N. H. (4) x. p. 95, W. Australia (claw-joint exserted).

Apionides.

Apion tamarisci and *poupilieri* have their tarsi constructed after the same scheme as those of *Hæmonia* and *Macronychus*: Leprieur, Bull. Soc. Ent. Fr. (5) ii. p. lviii.

Apion apricans: general observations on damages by it to clover seed, Ent. vi. p. 177.

Apion costipenne, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 193, note, New Caledonia.

Attelabides.

Attelabus bipustulatus, F.: method of constructing cases with leaves of *Quercus imbricaria*, and other particulars, by Mary E. Murtfeldt, Canad. Ent. iv. p. 143.

Rhinomacerides.

Rhynchites (*Bytiscus*) *princeps*, sp. n., Solsky, Hor. Ent. Ross. viii. p. 284, E. Siberia.

Magdalinides.

Weise, B. E. Z. xvi. pp. 145–152, analyzes Desbrochers's monograph, reproducing the diagnoses of spp. nn. He describes as *quercicola*, from Berlin, a var. of *M. flavicornis*, Gyll., p. 150. *M. languidus*, Boh., is apparently not European. *M. cæruleipennis*, Desbr., = *violaceus*, L., Redt.; *M. violaceus*, Desbr., *nec* L., = *frontalis*, Gyll.

Magdalinus carbonarius: larva feeds in *Betula alba*. R. Hislop, Ent. M. M. ix. p. 39.

Magdalinus kraatzi, Weise, *l. c.* p. 149, Austria; *M. caucasicus*, Tournier, R. Z. (2) xxiii. p. 255, Caucasus: spp. nn.

Balaninides.

Desbrochers, Ann. Soc. Ent. Fr. (5) ii. pp. 413–419, has published a first supplement to his monograph of this and the next group, giving fresh localities for certain species.

Balaninus mastersi, sp. n., Pascoe, Ann. N. H. (4) ix. p. 139, Queensland.

Anthonomides.

Anthonomus cinctus. v. Frauenfeld, Verh. z.-b. Wien, xxii. p. 393, refers to its economy in connexion with *Pyrus salicifolius*. *A. bituberculatus*, Thomson, apparently = *ulmi*, from note by the author, Opusc. Ent. (iv.) p. 393.

Nothops, Mars. (*Pseudomorphus*, Desbr.), merely forms a subdivision of *Bradybatus*, uniting it with *Anthonomus*. Localities &c. for *B. elongatulus* and *kellneri* are referred to: *Anthonomus stierlini*, Desbr., is redescribed, and fresh localities are given for various spp. of the genus. Desbrochers, *l. c.*

Aubeus [? *Aubæus*], g. n., Desbrochers, *l. c.* p. 413. Head suddenly and sharply constricted behind the eyes. *Anthonomus lethierrii*, Desbr., and *Aubeus bruleriei*, sp. n., *id. l. c.* p. 415, Jericho.

Anthonomus gracilipes, sp. n., *id. l. c.* p. 417, N. France.

Ceratopides.

Polydus, g. n., Pascoe, J. L. S. xi. p. 459. Much the habit of *Læmosaccus*, but evidently to be placed here, except for its short and stout rostrum. *P. dumosus*, sp. n., *id. ibid.* pl. xiii. fig. 4, Bahia.

Tychiides.

Tychius hæmatocephalus corroborated as British, and figured, E. C. Rye, Ent. Ann. 1873, p. 7, fig. 6.

Cionides.

Nanophyes. Kraatz, B. E. Z. xvi. pp. 47 & 48, publishes some notes on Andalusian species, and demurs to H. Brisout's reference of his *liliputanus* (inedit.) to *pallidulus*, Boh., as a var. *N. gracilis*, Redt., recorded as British; E. C. Rye, Ent. M. M. ix. p. 157.

Gymnetrides.

Gymnetrum melinum and *bellum*, spp. nn., Reitter, B. E. Z. xvi. pp. 49, Oran.

Derelomides.

Ochrophœbe, g. n., Pascoe, Ann. N. H. (4) ix. p. 139. Facies of *Sibinia*; allied to *Derelomus*, but not pubescent. *O. uniformis*, sp. n., *id. l. c.* p. 140, Champion Bay, W. Australia.

Derelomus albidus, sp. n., Suffrian, Arch. f. Nat. xxxviii. p. 159, Cuba.
Euerges dimidiatus, sp. n., *id. l. c.* p. 160, Cuba.

Læmosaccides.

Læmosaccus dapsilis, ? S. Australia, *longimanus*, Queensland, p. 140, *narinus*, Pt. Lincoln, *cryptonyx*, King George's Sound, p. 141 : Pascoe, *l. c.*, spp. nn.

Alcidides.

Alcides chaudoiri, (Chevr.) Guérin,=*karelini*, Boh.: J. Faust, Hor. Ent. Ross. viii. p. 278 (pl. v. fig. 3).

Haplonychides.

Zeopus, g. n., Pascoe, J. L. S. xi. p. 460. Allied to *Haplonyx* and *Aolles*, but with 6-jointed funiculus (of which the last joints are obconic and distinctly articulated) and 3-jointed tarsi, an elongate, arched rostrum, and postmedian scrobes. *Z. storeoides*, sp. n., *id. ibid.*, S. Australia.

Menemachides.

Berethia, g. n., *id. l. c.* p. 463. Differs from *Acicnemis* in its shorter and scarcely pedunculate femora, of which the posterior pair do not reach beyond the body, and in the first suture of the abdomen being obsolete. *B. medinotata*, pl. x. fig. 3, *sannio*, fig. 2, spp. nn., Ceram, *id. ibid.*

Semilima, g. n., *id. l. c.* p. 464. Two basal segments of abdomen united by obliteration of suture; ocular lobes present. *S. triangulum*, sp. n., *id. ibid.* pl. x. fig. 1, Sarawak.

Acicnemis pardalis, p. 460, Java, *subsignata*, Madras, *pedunculatis*, Singapore, *frenata*, Sarawak, p. 461, *meriones* (pl. x. fig. 5), Batchian, *palliata*, Japan, *pachymera*, Laos, p. 462, *brevipennis*, Batchian, Amboina, p. 463: *id. l. c.*, spp. nn.

Cholides.

Cholus. Pascoe, *l. c.* p. 465, note, failing entirely to separate *Polyderces*, thinks *Archarias* also impossible in some cases to distinguish from this genus, which he suggests, however, should be restricted to species with eyes round or oval, scape barely reaching the eye, club distinct, anterior coxæ more or less separated, and anterior tibiæ unguiculated as well as mucronated at apex. *C. carinatus*, Guér., is a *Callinotus*. He describes the following new genera and species:—

Erethistes, p. 471. Differs from *Perideræus* in having no ocular lobes, and the anterior tibiæ not being unguiculated. *Cholus lateralis*, *tetricus*, and *E. signuttatus*, and *E. leucospilus*, Cayenne, *licheneus* (pl. xi. fig. 6), Ecuador, *hriventris* and *congestus*, p. 472, Venezuela.

Mænomus, p. 472. Resembles *Brachycnemis* in its short tibiæ, otherwise more allied to *Cholus*: head enlarged behind eyes. *A. rubigineus*, ibid. pl. xi. fig. 5, Brazil.

Astyage, p. 473. Near *Cholus*, but scape impinging on eye, thorax conic, with acute posterior angles, and anterior tibiæ not unguiculate. *A. lineigera*, ibid. pl. xi. fig. 8, Brazil.

Ozopherus, ibid. Also allied to *Cholus*, but with elongate, transverse eyes, which are acuminate beneath; distinct ocular lobes, approximated anterior coxæ, biunguiculate tibiæ, the inner edge of the intermediate and posterior pairs of which is densely fringed. *O. muricatus*, p. 474, pl. xi. fig. 9, Amazons, Cayenne.

Necedus, p. 474. Differs from *Callinotus* in having a distinct antennal club, no ocular lobes, and no hook to apex of anterior tibiæ. *N. bivittatus*, ibid. pl. xi. fig. 7, Amazons.

Cryptaspis, p. 476. Approaches *Sclerosomus* in its short metasternum, but with unarmed tibiæ, a large and non-emarginate propectus, and no scutellum. *C. amplicollis*, ibid. pl. xi. fig. 10, New Granada.

Cholus pulchellus, p. 464, Cayenne, *æmulus*, p. 465, *uniformis*, p. 466, *bufoninus*, p. 467, *notabilis*, p. 470, pl. xi. fig. 1, Amazons, *brominus*, p. 466, Peru, *nivosus*, ibid., *sycophanta*, p. 468, New Granada, *atomarius*, p. 466, Venezuela, *delumbis* (=*basalis*, Boh.), p. 467, *buckleyi*, p. 469, pl. xi. fig. 3, Ecuador, *calamita*, p. 467, Brazil, *mimetes*, *curialis*, p. 468, *viduatus*, p. 469, *lecideosus*, p. 470, Nicaragua, *nitidicollis*, *hæmatostictus*, p. 469, Bogota, *prætorius*, p. 470, pl. xi. fig. 2, Panama.

Callinotus microspilotus, p. 474, Brazil.

Solenopus bilineatus, Cayenne, *transversalis*, pl. xi. fig. 4, Brazil, p. 475.

Cryptorhynchides.

Poropterus succosus, Boh., ? = *Cryptorhynchus succisus*, Er.: *id. l. c.* p. 484.

Tylodes is not generically distinct from *Acalles*: Suffrian, Arch. f. Nat. xxxviii. p. 174.

Rhinochenus. Roelofs, CR. Ent. Belg. xv. p. xlvii, criticizes Chevrolat's amended characters for this genus, and disputes its affinity to *Cratosomus*.

Mecomastyx montraveli, Lac., *nec* Perroud, is redescribed and named *lacordairii*; it is from New Caledonia. Chevrolat, *ibid.* p. xxix.

Trigonopterus, Fauv., *nec* Perroud (*Longicornia*), is renamed *Trigonus*: Fauvel, Bul. Soc. L. Norm. (2) i. p. 196.

New genera and species:—

Inozetes, Pascoe, J. L. S. xi. p. 479. Allied to *Psepholax* and *Strongylopterus*, but with 6-jointed funiculus and very short propectus. *I. petechialis*, id. *ibid.* pl. x. fig. 11, Batchian.

Osseteris, id. *ibid.* Differs from its nearest ally, *Empleurus*, Lac., in rostrum and scrobes. Pectoral channel limited behind by truncate anterior portion of mesosternum; but its sides behind anterior coxæ are open. *O. scutellaris*, id. *l. c.* p. 480, Dorey.

Therebus, id. *l. c.* p. 480. Allied to *Empleurus*; but rostrum thrice the length of head, more slender, straight, and with median scrobes. *T. cepuroides*, id. *ibid.*, W. Australia.

Metrania, id. *l. c.* p. 481. To be placed after *Mecistocerus*. Pectoral channel passing beyond metasternum to first segment of abdomen (not to extremity, as in *Panolcus*). *M. palliata*, id. *l. c.* p. 482, pl. xiii. fig. 11. Cayenne.

Metyrus, id. *l. c.* p. 482. Form of *Chætectetorus*, but allied to *Metacymia*, having, however, a larger claw-joint, a shorter metasternum, and a narrower

intercoxal process. *M. collaris*, id. *ibid.* pl. xii. fig. 4, W. Australia, and ? *Cryptorhynchus albicollis*, Germ.

Mœchius, id. Ann. N. H. (4) x. p. 96. Facies of *Melanterius*, allied to *Mecistocerus* and *Ædemonus*, Schön. (*nec* Lac., which requires renaming), but with pectoral channel passing behind intermediate coxæ, &c. *M. anaglyptus*, id. *ibid.*, Wide Bay.

Agriochæta, g. n., *id. ibid.* The pectoral channel places this in Lacordaire's subtribe *Ithyporides*, but it is questionable whether he would not have placed it in the *Erirhinides*. Facies of *Ocladius*. *A. crinita*, id. *l. c.* p. 97, pl. 1. fig. 2, Queensland.

Drassicus, id. *l. c.* p. 98. Differs from *Tragopus* in its short legs and thick femora, and from *Imaliodes* in the elytra not projecting beyond the prothorax at the base. *D. nigricornis*, ibid. pl. 1. fig. 3, *illotus*, p. 99, Queensland, *id. l. c.*

Agenopus, id. *l. c.* p. 99. Allied to *Poropterus*, but with linear tarsi, which are naked beneath, sparingly setulose at the sides, and with 3rd joint not bilobed. Differs from *Mormosintes* in not having its tarsi spongy or hispid beneath. *A. agricola*, id. *ibid.*, W. Australia.

Conotrachelus presbyta, p. 165, *lineola*, p. 167, *albicans*, p. 168, Cuba: Suffrian, Arch. f. Nat. xxxviii.

Cleogonus (?) *grossulus*, id. *l. c.* p. 170, Cuba.

Rhyssomatus pupillatus, id. *l. c.* p. 173, Cuba.

Guioperus eques, Pascoe, J. L. S. xi. p. 476, Nicaragua.

Euthyrhinus pictus, pl. x. fig. 12, Singapore, *iconicus*, Mysol, *id. l. c.* p. 477.

Aonychus luctuosus, id. *ibid.* pl. xii. fig. 1, W. Australia.

Ectatorhinus adamsi, Japan, *femoratus* (pl. x. fig. 10), Sarawak, *id. l. c.* p. 478.

Poropterus porrigineus (pl. xii. fig. 2), Victoria, *musculus*, Tasmania, p. 483, *bisignatus*, Moreton Bay, *foveipennis*, N. S. Wales, p. 484, *id. l. c.*

Petosiris cordipennis, id. *l. c.* p. 485, pl. xii. fig. 3, Queensland.

Hexymus monachus, id. *ibid.*, Queensland.

Colobodes nodulosus, Batchian, *fasciculatus* (pl. x. fig. 7), Amboina, *id. l. c.* p. 486.

Tragopus plagiatus, id. Ann. N. H. (4) x. p. 97, pl. 1. fig. 7, Queensland.

Imaliodes nodulosus, id. *l. c.* p. 98, Rockhampton.

Nechyrus incomptus, id. *l. c.* p. 99, pl. 1. fig. 9, Queensland.

Melanterius vinosus, p. 141, S. Australia, *cinnamomeus*, Champion Bay, *servulus*, King George's Sound, p. 142, *id.* Ann. N. H. (4) ix.

Acalles terrosus, p. 175, *stipulosus*, p. 176, *lateritius*, p. 177, *miserabilis*, p. 178, *plebeius*, p. 179, *ptochoides*, p. 181, *sulcifrons*, p. 182, *interruptus*, p. 185, *brunneus*, p. 186, *frontalis*, p. 188, *squamiger*, p. 190, Cuba: Suffrian, *l. c.*

Analcis fulvicornis, id. *l. c.* p. 192, Cuba.

Ulosomus furo, p. 193, *laticaudis*, p. 196, Cuba: *id. l. c.*

Pseudomus rugifer, p. 201, *maximus*, p. 204, *bimaculatus*, p. 206, Cuba: *id. l. c.*

Trigonus jekeli, Fauvel, Bull. Soc. L. Norm. (2) i. p. 196, note, New Caledonia.

(? g. n. unnamed, uncharacterized) *grisescens*, Suffrian, *l. c.* p. 162, Cuba.

Zygopides.

Latychus, g. n., Pascoe, J. L. S. xi. p. 486. Allied to *Pinarus* and *Piazurus*, but with a stout and rather short rostrum, rather small eyes, not contiguous to the prothorax or to each other, and the femora but slightly thickened, and not toothed beneath. *L. rivulosus*, sp. n., *id. ibid.* pl. xiii. fig. 9, Brazil.

Idotasia æqualis, Cape York, *evanida*, Queensland, *id.* Ann. N. H. (4) x. p. 100, spp. nn.

Ceuthorhynchides.

Ceuthorhynchus contractus: v. Frauenfeld, Verh. z.-b. Wien, xxii. p. 394, refers to its economy in connexion with *Thlaspi perfoliatum*. *C. stenbergi*, Thoms., = *melanostictus*, Msh.: Thomson, Opusc. Ent. (iv.) p. 392.

Ceuthorhynchideus chevrolati (Bris. MS.) occurs chiefly in restricted localities in Kent. W. Tylden, Ent. M. M. viii. p. 205.

Rhinoncus subfasciatus possessed of saltatory power: E. A. Waterhouse, Ent. M. M. ix. p. 119.

Mononychus 4-*fossulatus*, Algiers, *tangerianus*, Tangiers, Chevrolat, Ann. Soc. Ent. Fr. (5) ii. p. 412, spp. nn.

Ceuthorhynchus unguicularis, sp. n., Thomson, *l. c.* p. 391, Œland.

Baridiides.

Baridius scolopaceus, Germ.: food-plant in Britain, *Atriplex portulacoides*; G. C. Champion, Ent. M. M. ix. p. 117.

Methyorrhina, g. n., Poscoe, J. L. S. xi. p. 487. Allied to *Phacelobarus*, but with ocular lobes, and rostrum not compressed or gibbous at the base, and sharply constricted at its junction with the head. *M. hispida*, sp. n., *id. ibid.*, Brazil.

Pithecomus, g. n., *ib. ibid.* Differs from both the last mentioned genera in the form of its rostrum, which proceeds gradually from the head, narrowing in profile to the apex. *P. ursulus*, sp. n., *id. l. c.* p. 488, pl. xiii. fig. 5, Bogota.

Bebelatus, g. n., *id. l. c.* p. 488. Resembles a small spider! Anterior coxæ sloped for reception of rostrum. *B. aranea*, sp. n., *id. l. c.* p. 489, pl. xiii. fig. 7, Amazons.

Eurypages, g. n., *id. l. c.* p. 489. Compared with *Centrinus*, Schön., this genus differs principally in the absence of a pectoral channel, and in the remoteness of the anterior coxæ. *E. pennatus*, sp. n., *id. ibid.* pl. xiii. fig. 6, Brazil.

Cossonides.

Microxylobius westwoodi, Chevr., redescribed: Wollaston, Ann. N. H. (4) ix. p. 112.

Phlœophagus spadix and *scalptus* are sexes of one species: Desbrochers, Ann. Soc. Ent. Fr. (5) ii. p. 428.

Raymondia curvinasus, sp. n., Abeille, Étud. Col. Cav. p. 39, Marseilles.

Phænomerus notatus, pl. xiii. fig. 2, New Guinea, *exilis*, Queensland, spp. nn., Pascoe, J. L. S. xi. p. 496.

SCOLYTIDÆ.

In "Les Oiseaux et les Insectes," by E. Perris [suprà, p. 227], is a general account of the ravages of members of this family. In many trees, especially in those that are resinous, disease is inevitably followed by death; and disease is frequently caused by the perfect insects eating the young top shoots.

Hylesinus. T. A. Chapman's observations on the habits of *H. crenatus*, *fraxini*, and *vittatus* are translated in Nouv. et Faits, p. cvi *et seq.*

Tomicus typographus: ravages and parasites in Styria described by Giraud, Bull. Soc. Ent. Fr. (5) ii. p. viii.

Hylastes lifuanus, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 199, note, Lifu.

Polygraphus subopacus, sp. n., Thomson, Opusc. Ent. (iv.) p. 393, Sweden.

BRENTHIDÆ.

Cyphagogus advena, Pasc., re-examined, is apparently referred to its correct genus; *Aprostoma*, Guér. (*Mecedanum*, Er.), is a Colydiid, according to F. P. Pascoe, Ann. N. H. (4) x. p. 320, who describes the following new genera and species:—

Stratiorrhina, p. 322. *Arrhenodinæ*: differs from *Estenorhinus* in its rostrum being serrate or dentate before the antennæ, and in its small concrete mandibles. Type *Arrhenodes xiphias*, Westw.

Blysmia, p. 323. *Belophorinæ*: tarsi apparently glabrous beneath; abdomen comparatively short, but nearly twice as long as metasternum. *B. ruficollis*, p. 324, pl. xv. fig. 1, Batchian.

Phocylides, p. 324. *Ithysteninæ*: antennæ shorter and stouter than in *Prodector* or *Diurus*; elytra drawn out at apex to two parallel and contiguous tails, nearly as wide as the rest of the elytra. *P. collaris*, pl. xv. fig. 2, Batchian, *ebeninus*, Amboina, p. 325, and *Brenthus ruficollis*, Guér.

Achrionota, p. 325. Differs from *Ithystenus* in its linear femora, and in having only one sutural stria to each elytron; and from *Diurus* in having the rostrum dilated at the apex. *A. bilineata*, ibid. pl. xv. fig. 3, Sarawak.

Taphroderes filiformis, p. 319, *obtusus*, p. 320, Amazons.

Ionthocerus ophthalmicus, p. 320, pl. xv. fig. 4, Queensland.

Trachelizus howitti, ibid., Melbourne.

Cordus (? g. n.) *semipunctatus*, p. 321, pl. xv. fig. 7, Natal.

Amorphocephalus sulcicollis, ibid., W. Australia (see pl. xv. figs. 9 *a* & 9 *b*).

Prophthalmus sanguinalis, pl. xv. fig. 6, India, *planipennis*, ibid. fig. 5, Celebes, p. 322.

Eupsalis promissus, p. 323, pl. xv. fig. 8, Batchian.

Ceocephalus internatus, Queensland, *tenuitarsis*, Sydney, p. 324.

ANTHRIBIDÆ.

Phlœophilus, Schön., is three years posterior in date to *Phlœophilus* of Stephens, and the name *Lemmophilus* is proposed for it. E. C. Rye, Ent. Mo. Mag. ix. p. 86 [rectius *Lemmatophilus*, clashing with *Lemmatophila*, Treitschke, *Lep.*].

CERAMBYCIDÆ.

H. W. BATES, Tr. E. Soc. 1872, pp. 163–238, describes species (about

280) found by Mr. Belt near St. Domingo, Chontales, Nicaragua. He gives the latter's general observations on that district; and, from an analysis of the collection, comes to the conclusions:—1, that there is a homogeneity of type of the insect fauna of the forest region of Tropical America, over probably 45 degrees of latitude, with great local speciality; and, 2, that there is a distinct northern element, the metropolis of which is Central America.

C. Blessig and S. Solsky, Hor. Ent. Ross. ix. pp. 113–192, commence a descriptive enumeration of the *Longicornia* of S.E. Siberia, especially of Amour-land.

Tournier, R. Z. (2) xxiii. pp. 257, 276, 338 *et seqq.*, catalogues the species found by T. Deyrolle in Imeretia, Mingrelia, and Georgia, describing some as new.

Prionides.

Prionocalus, White: generic characters amended, the species tabulated, and ♀ of *P. cacicus* described. C. O. Waterhouse, Ent. M. M. viii. p. 260.

Orthosoma cylindricum and *Prionus imbricornis*: on the stridulating organs of these species, *cf.* C. V. Riley, Canad. Ent. iv. p. 139.

Prionus insularis, Mots., from S.E. Siberia. Blessig & Solsky, Hor. Ent. Ross. ix. p. 164.

Callipogon barbatus, F., probably described from the form occurring at Nicaragua; if so, the Mexican form should take the name *senex*, Dup.: H. W. Bates, Tr. E. Soc. 1872, p. 167.

Mallodon gnatho, Lec., *nec* White, is renamed *mandibularis*: Gemminger, C. H. x. p. 254.

Mallaspis paradoxa, H. W. Bates: ♂ described by the author, *l. c.* p. 168.

Ortheostethus, g. n., *id. l. c.* p. 169. *Pœcilosominæ*: resembles certain *Pyrodes*; differs from *Nicias* in its robust serrated antennæ. *O. melanurus*, sp. n., *id. l. c.* p. 170, Chontales.

Prionocalus buckleyi, sp. n., C. O. Waterhouse, *l. c.* p. 261, Ecuador.

Ergates grandiceps, sp. n., Tournier, R. Z. (2) xxiii. p. 257, Bagdad.

Macrotoma fuliginosa, sp. n., Fåhræus, Œfv. Ak. Förh. xxix. no. 1, p. 47, Caffraria.

Braderochus longicornis, Nicaragua, p. 166, *inæqualis*, Guatemala, p. 167, note: H. W. Bates, *l. c.*, spp. nn.

Strongylaspis bullatus [*-ta*], sp. n., *id. l. c.* p. 167, Chontales.

Archetypus? *deplanchii*, sp. n., J. Thomson, Bull. Soc. L. Norm. (2) i. p. 205, note, pl. i. fig. 17, Lifu.

Cerambycides.

Fåhræus, Œfv. Ak. Förh. xxix. (1872) no. 1, pp. 45–69, no. 2, pp. 29–60, under the heading "Coleoptera Caffrariæ, Longicornia," describes the species collected by Wahlberg in Caffraria.

Achryson surinamum, L., var. n. *chontalense*, p. 171, Chontales; *Hammaticerus castaneus*, Bates, ? = *mexicanus*, Thoms., and only differs in colour from *batus*, L., p. 171; *Eburia proletaria*, Er., and *morosa*, Serv., belong to *Pontomallus*, p. 173; in *Trichophorus* the antennal spines in some cases afford only a sexual character, p. 176; *Ibidion textile* and *mexicanum*, Thoms., are possibly sexes or varr. of the same species, p. 181: H. W. Bates, Tr. E. Soc. 1872.

? *Anoplistes affinis*, Mots.,=*altaiensis*, Laxm., p. 174; *Cerambyx sibiricus*, Gmel., *bicinctus*, Ol.,=*Polyzonus fasciatus*, F., p. 177; *Clytus popovii*, Mann., ?=*altaicus*, Gebl., p. 187; *C. 6-maculatus*, Mots.,=*verbasci*, F., var., p. 190; *C. angusticollis*, Muls., ?=*gracilipes*, Fald., p. 191: Blessig, Hor. Ent. Ross. ix.

Criocephalus ferus, Ktz.,=*epibata*, Schiödte, which probably has priority; and the identity of it with the long prior *coriaceus* and *polonicus* of Motschoulsky is suggested. The differential characters of it and *C. rusticus* are pointed out. Kraatz, B. E. Z. xvi. pp. 319 & 320.

Exilia timida, Mén., var. n. *brunnea*, from Koutais: Tournier, R. Z. (2) xxiii. p. 280.

Sympies[t]ocera laurasi: its habits at Fontainebleau (apparently its most northern limit, and where it is not rare) recorded by Léveillé, Bull. Soc. Ent. Fr. (5) ii. pp. xxxv & lxvii. Notes on a parasite, one of the *Braconidæ*: id. & Grouvelle, *ibid.* p. lii.

Clytus mysticus: v. Frauenfeld, Verh. z.-b. Wien, xxii. p. 395, refers to its economy in connexion with *Diospyrus lotus*.

Phœnicus sanguineipennis, Lac., and *Ischnocnemis*, Thoms.: Dohrn, S. E. Z. xxxiii. p. 160 *et seq.*, discusses characters and synonymy.

A ♀ of *Vesperus xatarti* deposited eggs and died in December: at liberty, the species is matured towards the end of autumn, and would be found during the winter. Lichtenstein, Bull. Soc. Ent. Fr. (5) ii. p. v. Grenier, *ibid.*, thinks it a vernal species. *Cf.* Lucas, *ibid.* p. lxxxi.

New genera and species :—

Aporus, [Spinola, *Hym.* 1808], Fåhræus, *l. c.* no. 1, p. 54. Belongs to Lacordaire's "Sectio A." *A. cylindricus*, id. *ibid.*, Caffraria.

Adiaphorus (preoccupied in *Elateridæ*, and altered to *Acathartus* by the author, C. H. x. p. 194), *id. l. c.* p. 55. Same section. *A. crinitus*, id. *ibid.*, Caffraria.

Lygrus (altered to *Zoolygrus*, on account of *Lygris*, in *Lepidoptera*, id. *l. c.*), id. *ibid.* Same section. *L. apicalis*, id. *l. c.* p. 56, Caffraria.

Tristachycera, H. W. Bates, Tr. E. Soc. 1872, p. 170. Of the metallic colouring of *Xystrocera*, but form (especially as to thorax) of *Œme*. *T. viridis*, id. *l. c.* p. 171, Chontales.

Neomarius, Fairmaire, R. Z. (2) xxiii. p. 60. Allied to *Xytrocera*. *N. gandolphii*, id. *ibid.*, Algeria.

Miltesthus, H. W. Bates, *l. c.* p. 177. Allied to *Sphærion*, but of different facies, and with no carinæ to the tibiæ. *M. marginatus*, id. *l. c.* p. 178, Chontales.

Ironeus, id. *l. c.* p. 178. Allied to *Peribœus*, but with smaller and less prominent eyes, which are much less coarsely faceted. In the *Sphærion* group. *I. duplex*, id. *l. c.* p. 179, Chontales.

Cosmius (preoccupied in *Diptera*, and altered to *Zoocosmius*, *l. c.* p. 194), Fåhræus, *l. c.* p. 67. In Section B of Lacordaire. *C. vittatus*, id. *ibid.*, Caffraria.

Eutactus [*Eut-*] (altered to *Agnoristus*, on account of *Eutactis* in *Lepidoptera*, l. c.), *id. l. c.* p. 68. Allied to *Zoocosmius*. *E. lineatus*, id. *ibid.*, Caffraria.

Chontalia, H. W. Bates, *l. c.* p. 233. *Lepturinæ*. Allied to *Ophistomis*, but

resembling *Dorcasomus* and *Desmocerus* in facies. *C. cyanicollis*, id. *ibid.*, Chontales.

Tethlimmena, id. *l. c.* p. 185. *Eroscheminæ*, near *Pyrocalymma*. *T. aliena*, id. *ibid.*, Chontales.

Evgoa [*Eug-*], Fåhræus, *l. c.* p. 57. Allied to *Zonopterus*. *E. dalmani*, id. *ibid.*, Caffraria.

Promecidus, id. *l. c.* p. 62. Allied to *Promeces*. Type *P. chalybeatus*, White.

Hypocrites, id. *ibid.* Also allied to *Promeces*. *H. mendax*, ibid., *ambiguus*, p. 63, *id. l. c.*, Caffraria.

Evgenius [*Eug-*], id. *l. c.* p. 65. Belongs to the *Compsocerides*. *E. plumatus*, id. *ibid.*, Caffraria.

Diphyrama, H. W. Bates, *l. c.* p. 187. *Tillomorphinæ*. Allied to *Ipomoria* and *Epropetes*, but with joints 3 & 4 of antennæ in both sexes strongly ovate-clavate. *D. singularis*, id. *l. c.* p. 188, Chontales.

Metaleptus, id. *l. c.* p. 192. Differs from *Purpuricenus* in its elongate, slender, posterior tarsi and the more slender antennæ of its male. *M. marginellus* and *coccinatus*, Chontales, p. 193, *binoculus*, Mexico, *ibid.*, note, *id. l. c.*

Pleuromenus, id. *l. c.* p. 194. *Stenaspidinæ*. Head and palpi of *Purpuricenus*. Somewhat resembles *Entomosterna*, but with short and wide posterior tarsi, and the sterna much elevated between the coxæ. *P. baccifer*, ibid., *semicostatus*, p. 195, *id. l. c.*, Nicaragua.

Apheles, Blessig, Hor. Ent. Ross. ix. p. 165. Allied to *Distenia*, *Cometes*, and *Noemia*. *A. gracilis*, id. *l. c.* p. 198, pl. viii. fig. 1, Port Mai, S.E. Siberia.

Asemum punctulatum, id. *l. c.* p. 182, S.E. Siberia.

Zamium triviale, p. 48, *4-signatum*, *dispar*, p. 49: Fåhræus, *l. c.*, Caffraria.

Xystrocera semilunaris, id. *l. c.* p. 50, Caffraria.

Cælodon rusticum, id. *ibid.*, Caffraria.

Neocerambyx raddii, Blessig, *l. c.* p. 170, pl. vii. fig. 1, S.E. Siberia.

Plocæderus pronus and *frenatus*, Fåhræus, *l. c.* p. 51, Caffraria.

Tapinolachnus gyllenhali and *furvus*, id. *l. c.* p. 52, Caffraria.

Stromatium inermis[*-me*], Tournier, R. Z. (2) xxiii. p. 260, Bagdad.

Sphallenum robustum, H. W. Bates, *l. c.* p. 172, Chontales.

Xestia pilosivittata and *nitida*, p. 172, *sagittaria*, p. 173: *id. l. c.*, Chontales.

Pantomallus fuligineus, p. 173, Chontales, *meridianus*, p. 174, note, Venezuela: *id. l. c.*

Eburodacrys [rectius *Eborid-*; vox hybr.] *callixantha*, id. *l. c.* p. 174, Chontales.

Hypermallus scabricollis, id. *l. c.* p. 175, Chontales.

Cordylomera schœnherri, Fåhræus, *l. c.* p. 53, Caffraria.

Trichophorus albisparsus, H. W. Bates, *l. c.* p. 175, Chontales.

Peribœum villosulum and *bimaculatum*, id. *l. c.* p. 176, Chontales.

Niphalius vestioides and *rutilus*, id. *l. c.* p. 177, Chontales.

Mallocera spinicollis, id. *l. c.* p. 179, Chontales.

Hexoplon albipenne, id. *ibid.*, Chontales.

Octoplon glabriolum, id. *l. c.* p. 180, Chontales.

Ibidion carinicolle and *griseicolle*, id. *ibid.*, Chontales.

Heterachthes ditelus, p. 181, *nigricinctus*, p. 182: *id. l. c.*, Chontales.

Obrium caucasicum, Tournier, *l. c.* p. 279, Persath; *O. albifasciatum*, H. W. Bates, *l. c.* p. 182, Chontales.

Ophi[o]stomis belti, p. 182, *pallidus* and *rufiventris*, p. 183, *nigellus*, p. 233, Chontales, *rostratus*, New Granada, *fulvicornis*, Brazil, p. 183, note: H. W. Bates, *l. c.*

Toxotus biforme[-mis], Tournier, *l. c.* p. 342, Persath.

Strangalia mingrelica, id. *l. c.* p. 344, Mingrelia.

Leptura pallidipennis, p. 346, Ratcha, *distincta*, p. 347, Persath: *id. l. c.*

Anoplodera rufiventris, id. *l. c.* p. 348, Persath, Koutais.

Psebium linnæi, Fåhræus, *l. c.* p. 56, Caffraria.

Ommata beltiana and *cyaneipennis*, Chontales, p. 184, *atrata* and *asperiventris*, Brazil, *ibid.*, note: H. W. Bates, *l. c.*

Odontocera ægrota, id. *l. c.* p. 233, Chontales.

Hypatium friesi, Fåhræus, *l. c.* p. 58, Caffraria.

Callichroma cuprea[-eum], id. *ibid.*, Caffraria; *C. holochlorum*, p. 185, Chontales, *melancholicum*, p. 186, note, Mexico, H. W. Bates, *l. c.*

Rhopalizus cinctus, Fåhræus, *l. c.* p. 59, Caffraria.

Litopus caffer, id. *l. c.* p. 60, Caffraria.

Promeces velox, *fulvipes*, and *pauper*, id. *l. c.* p. 61, Caffraria.

Closteromerus gracilis, id. *l. c.* p. 63, Caffraria.

Helymæus glabripennis and *rufipes*, id. *l. c.* p. 64, Caffraria.

Mecomeiopus macilentus, H. W. Bates, *l. c.* p. 187, Chontales.

Rhopalophora serripes, id. *l. c.* p. 188, Chontales.

Hylotrypes koziorowiczi, Desbrochers, Ann. Soc. Ent. Fr. (5) ii. p. 429, Ajaccio.

Rhopalopus signaticollis, Solsky, Hor. Ent. Ross. ix. p. 177, S.E. Siberia.

Callidium cinnaberinum [*-barinum*], Blessig, *l. c.* p. 179, S.E. Siberia.

Clytus stierlini, Tournier, *l. c.* p. 276, note, Bernese Alps; *C. aubonneri*, Desbrochers, *l. c.* p. 429, Allier; *C.* (*Plagionotus*) *pulcher*, Blessig, *l. c.* p. 184, pl. viii. fig. 2, S.E. Siberia; *C.* (*Anaglyptus*) *deyrollii*, Tournier, *l. c.* p. 277, Batcha (unites *Anaglyptus* and *Cyrtophorus*).

Clytanthus westringi, Fåhræus, *l. c.* p. 66, Caffraria.

Xylothrecus caffer, id. *ibid.*, Caffraria.

Dihamm[at]ophora chontalensis, H. W. Bates, *l. c.* p. 188, Chontales.

Ozodes xanthophasma, id. *l. c.* p. 189, Chontales.

Chrysoprasis belti, p. 190, Chontales, *atrata*, ibid., note, Venezuela: *id. l. c.*

Stenosphenus ochraceus, p. 190, *ebeninus*, p. 234, Chontales, *hirsutipennis*, *trispinosus*, *rufipes*, *suturalis*, p. 191, note, Mexico: *id. l. c.*

Evander nobilis, id. *l. c.* p. 192, Chontales.

Philagathes wahlbergi, Fåhræus, *l. c.* p. 68, Caffraria.

Eleanor dohrni, id. *l. c.* p. 69, Caffraria.

Anoplistes sanguineipennis, Blessig, *l. c.* p. 175, Amour Land.

Eriphus prolixus, H. W. Bates, *l. c.* p. 193, Esquipula, Nicaragua.

Distenia geniculata, p. 195, *chrysostigma*, p. 196, *id. l. c.*, Chontales.

Comotes pulcherrimus, id. *l. c.* p. 196, Chontales.

Lamiides.

The posthumous second part of the ninth volume of Lacordaire's 'Genera des Coléoptères,' dated 1872, contains the completion of his original scheme of classification of the 'Longi-

cornes.' In it, the 3rd "Tribe" (*Lamiides vraies*) of the 3rd subfamily, *Lamiides*, is ended by the discussion of its 2nd division, containing the following numerous groups (often founded on a single genus) :—

Tragocephalides (p. 417), *Cliniides* (p. 424), *Ceroplesides* (p. 425), *Phrynetides* (p. 432), *Baroides* (p. 439), *Xylorhizides* (p. 443), *Omacanthides* (p. 447), *Rhodopides* (p. 450), *Protonarthrides* (p. 452), *Acmocerides* (p. 453), *Protorhopalides* (p. 455), *Dorcaschemides* (p. 456), *Xenoleides* (p. 460), *Nemotragides* (p. 461), *Anauxesides* (p. 462), *Auxesides* (p. 463), *Methiides* (p. 465), *Nyctemenides* (p. 467), *Amymomides* (p. 468), *Homoneides* (p. 469), *Crinotarsides* (p. 475), *Bumetopides* (p. 477), *Arsysiides* (p. 479), *Leptonotides* (p. 483), *Enotides* (p. 487), *Tapeinides* (p. 488), *Epicastides* (p. 490), *Theocrides* (p. 494), *Atossides* (p. 496), *Zygocerides* (p. 498), *Disternides* (p. 500), *Ecyroschemides* (p. 503), *Crossotides* (p. 505), *Hebesecides* (p. 510), *Hecyridides* (p. 517), *Niphonides* (p. 519), *Apomecynides* (p. 579), *Clioniocerides* (p. 590), *Agennopsides* (p. 593) [better *Adetides*, as *Agennopsis*, Thoms., = *Adetus*, Lec. : Candèze, *ibid.* pp. 592 & 593, notes], *Pteropliides* (p. 595), *Ataxiides* (p. 597), *Ptericoptides* (p. 601), *Desmiphorides* (p. 620), *Apodasyides* (p. 623), *Nedinides* (p. 635), *Estolides* (p. 636), *Pogonocherides* (p. 650), *Megabasides* (p. 657), *Compsosomides* (p. 659), *Æreneides* (p. 662), *Phacellides* (p. 664), *Onciderides* (p. 666), *Onocephalides* (p. 688), *Hippopsides* (p. 690), *Spalacopsides* (p. 701), *Ectatosiides* (p. 708), *Ischiolonchides* (p. 709), *Emphytœciides* (p. 713), *Anisocerides* (p. 716), *Platysternides* (p. 729), *Polyraphides* (p. 731), *Acrocinides* (p. 732), *Acanthoderides* (p. 735), *Acanthocinides* (p. 757), *Cyrtinides* (p. 818), *Colobotheides* (p. 821), *Agapanthiides* (p. 829), *Saperdides* (p. 831), and *Gleneides* (p. 841).

The 4th Tribe, *Phytœciides*, is composed of the following groups :—*P. vraies* (p. 849), *Tetraopides* (p. 871), *Amphionychides* (p. 881), *Ærenicides* (p. 897), *Gryllicides* (p. 902), *Calliides* (p. 905), and *Hebestolides* (p. 910).

Fåhræus, C. H. x. pp. 195 & 196, makes the following observations (among others) upon species contained in his 'Coleoptera Caffrariæ, Longicornia,' as affected by the above work :—*Phyma[to]sterna* (*Solymus*, Lac.) *pictor* seems allied to the *Crossotides*; *Pycnopsis brachyptera* is the same as Thomson's sp. of that name; *Tragiscoschema amabile*, Perroud, *Tragiscus lascivus*, Thoms., and *Tragocephala gracilicornis*, Chevr., are all one species; *Cerambyx obscurus*, Ol., seems not to be a *Phryneta*, but allied to *Lamia brunneicornis*, and apparently better placed in *Inesida*; *Clioniocerus kraussi* does not justify the erection of a separate genus (*Thercladodes*).

Tæniotes suturalis, Thoms., = *scalaris*, F., var.; *Agennopsis mexicana*, Thoms., = *Adetus muticus*, Thoms., and ? = *Adetus analis*, Lec. (*Polyopsia ead.*, Hald.); *Hypsioma gemmata*, Blanch., is a *Jamesia*; *Trestonia coarctata*, Bates, = *Cylicasta terminata*, Buquet; *Lagochirus v-album*, Bates, = *binumeratus*, Thoms.; *Anisocerus personatus*, Bates, = *palliatus*, White; *Anisopodus phalangioides*, Er., attains an enormous development in Chontales, and *Tetrapanidius geminus*, Pascoe, originally recorded from Cayenne, occurs also there; *Colobothea dioptica*, Bates, = *Priscilla hypsiomoides*, Thoms.: H. W. Bates, Tr. E. Soc. 1872, p. 197 *et seq.*

Dorcadion pedestre, L., var. n. *kraatzi*, from Turkey, p. 281, note; *D. suturaalba*, Desbr., = *gallipolitanum*, Thoms.; *D. balcanicum*, Mill. [? before

published], described, p. 284, note: Tournier, R. Z. (2) xxiii. *D. fuliginator*: great swarms of this species at Champrosay recorded, and *mendax*, Muls., considered to be connected to it by intermediate stages. Localities and habits of others of the genus mentioned. Fallou, Bull. Soc. Ent. Fr. (5) ii. p. xxxiii. Desbrochers, *ibid.* p. lxxxv, doubts that *mendax* is satisfactorily to be connected with *fuliginator* (which feeds on roots of grasses); if it be so, other species must also be connected with it, and many others suppressed. A. Chevrolat, *ibid.* p. lxxxvi, considers the so-called *mendax*, recorded from Gannat, to be *pyrenæum*.

Ibidi[oni]morphum, Mots. (in Schrenck's Reisen und Forschungen im Amurlande, ii. p. 152), fully characterized. Blessig, Hor. Ent. Ross. viii. p. 191.

Ædilis montana. ♂ apparently attracted by trace of presence of ♀, under very peculiar circumstances: Fromont, CR. Ent. Belg. xv. p. cxvi.

Phytœcia rufiventris fully described by Des Cottes, MT. schw. ent. Ges. iii. p. 524.

Oberea euphorbiæ: bred from *Euphorbia* in the Valais, and its specific characters pointed out. Abeille de Perrin, Nouv. et Faits, p. cix.

New genera and species:—

Phygas (preoccupied in *Lepidoptera*, and altered to *Herpetophygas* by the author, C. H. x. p. 194), Fåhræus, Œfv. Ak. Förh. xxix. no. 3, p. 31. Belongs to the *Ancylonotides*. *P. fasciatus*, id. *ibid.*, Caffraria.

Arr[h]ostus [*Arrhostia*, Hübn., *Lepid.*], id. *l. c.* p. 32. In Lacordaire's Section B. *A. pauper*, id. *ibid.*, Caffraria.

Zalat[o]ida, id. *l. c.* p. 33. Allied to *Zalate*. *Z. paykulli*, id. *l. c.* p. 34, Caffraria.

Phrynesthis, Lacordaire, *l. c.* p. 440. Facies of *Pachystola*, and probably including some species now attributed to that genus. *P. pachystoloides*, p. 441, note, Zambesi.

Temnoscelis (Chevr., uncharact.), *id. l. c.* p. 441. Type *T. waddeli*, Chevr.

Stenobia, id. *l. c.* p. 442. Somewhat the facies of *Thylactus angularis*. *S. pradieri*, ibid., Gaboon.

Zygocera (Dej., inedit.) [*Zygoceros*, Ehr., Polyg., 1840], id. *l. c.* p. 499. Type *Acanthocinus pruinosus*, Boisd.

Eumimetes, id. *l. c.* p. 506. Differs from *Frea*, Thoms., in its prothorax being scarcely tuberculated on the sides, and its scutellum strongly transverse-quadrate. Type *Lamia sparsa*, Klug.

Solymus, id. *l. c.* p. 507. Closely allied to *Pterotragus*. *Phyma[to]sterna pictor*, Dej. Cat., Madagascar.

Retilla, id. *l. c.* p. 512. Allied to *Probatodes*, Thoms., but with prothorax scarcely tuberculated on the sides, and mesosternum rather wide, vertical, and concave in front. *R. indigens*, ibid., Malasia.

Hylobrotus, id. *l. c.* p. 538. Closely allied to *Praonetha*, Pasc., but of very different facies. *H. plœmi*, p. 539, note, Java and Malacca.

Diatylus, id. *l. c.* p. 565. Allied to *Sthenias*. *D. zonarius*, ibid., note, Malasia.

Vocula, id. *l. c.* p. 587. Allied to *Hippaphesis*, Thoms., but differing widely in structure of the antennæ and sculpture. *V. guttifera* and *irrorata*, *ibid.*, note, Gaboon.

Athenes (altered by the author, *l. c.*, to *Molyctypus*, on account of *Athenea*, in *Lepidoptera*), Fåhræus, *l. c.* p. 36. Belongs to the *Apomecynides*. *A. caudatus*, id. *ibid.*, Caffraria.

Sulenus, Lacordaire, *l. c.* p. 638. 4 front tarsi of ♂ strongly dilated; resembles the American *Blabia*. *S. humeralis*, p. 639, note, Madagascar.

Styne, id. *l. c.* p. 648. But for the scape of its antennæ being quite different, to be placed near *Omoderisus* [a g. n. of *Acanthocinides* subsequently characterized, and possibly referred to in error]. *S. divaricata*, id. *ibid.*, note, ? Madagascar.

Soluta, id. *l. c.* p. 657. Closely resembles *Graminea* (*Calliides*), but with unfurrowed front legs, and simple hooks to the tarsi. *S. gramineoides*, ibid., note, Brazil.

Periergates, id. *l. c.* p. 679. Facies of *Oncideres*, but antennæ of quite different form. *P. rodriguezi*, ibid., note, Guatemala.

Perma, id. *l. c.* p. 690. Facies of *Ischiocentra*; differs from *Onocephala* in its head being slightly concave between the antenniferous tubercles, which are strongly separated, very short and truncate, &c. *P. aulica*, ibid. note, Brazil.

Smermus, id. *l. c.* p. 696. Facies of *Aliboron antennatum*. *S. mniszechi*, *ibid.*, note, Sylhet.

Symperga, id. *l. c.* p. 711. Type *Gryllica balii*, Thoms.

Olenosus, H. W. Bates, *l. c.* p. 205. *Acanthoderinæ*: closely allied to *Alphus* and *Æthomerus*, differing from both in the more elongate basal joint of its antennæ, which forms a moderately abrupt elongate-oval club. *O. serrimanus*, id. *l. c.* p. 206, Chontales and Mexico.

Mecotetartus, id. *l. c.* p. 213. A *Liopus* form, remarkable for the enormous length of the 4th antennal joint in the ♂. *M. antennatus*, id. *ibid.*, Chontales.

Omoderisus, Lacordaire, *l. c.* p. 803. Allied to *Nonyma* and *Criodule*, Pasc., but with longer posterior tarsi. *O. deyrollii*, p. 804, note, Madagascar.

Carphina, H. W. Bates, *l. c.* p. 223. Differs from *Eutrypanus* in the distinct and elongated lateral carinæ of the elytra, and in the form of the thorax. *C. arcifera*, id. *ibid.*, Chontales, and *Colobothea lignicolor* and *lignecola*, and *Eutrypanus assula*, Bates.

Singalia, Lacordaire, *l. c.* p. 834. Unlike any described Saperdoid, its free abdomen and four front femora recalling the *Œmides*. *S. spinipennis*, p. 835, note, Taprobana.

Malloderma, id. *l. c.* p. 842. Allied to *Glenea*, Newm., but elytra strongly declivous behind. *M. pascoii*, ibid., note, E. Indies.

Eulachnesia, H. W. Bates, *l. c.* p. 231. Between *Amphionycha* and *Ærenica*; head not retractile; antennæ thick, filiform, densely ciliated; eyes more distant from prothorax than in the latter genus. Type *Amphionycha sapphira*, Bates, and *E. smaragdina*, id. *ibid.*, Chontales.

Chalanus (preoccupied in *Diptera*, altered to *Anomamomus* by the author, *l. c.*), Fåhræus, *l. c.* p. 45. *E. leucaspis*, id. *ibid.*, Caffraria.

Acartus, id. *l. c.* p. 50. Belongs to the *Hebestolides*. *A. hirtus*, id. *ibid.*, Caffraria.

Amblesthidus, id. *l. c.* p. 51. Allied to *Amblesthis*. *A. plagiatus*, ibid., *simplex*, p. 52, *id. l. c.*, Caffraria.

Dorcadion immersum, Turkey, p. 281, note, *impressicorne*, p. 282, Gori, *abeillii*, ibid., note, Turkey, *nodicornis*[*-ne*], p. 287, note, Taurus, *gandolphii*, ibid., Gallipoli, *auratum*, p. 291, Sourram, *modestum*, p. 338, Annenfeld, *obesum* [preoccupied by Des Cottes, 1870], p. 340, Sourram: Tournier, R. Z. (2) xxiii.

Phantasis carinata, Fåhræus, *l. c.* p. 29, Caffraria.

Monohammus degeeri, id. *l. c.* p. 30, Caffraria.

Ptychodes cretatus, Chontales, p. 197, *niveisparsus*, Panama, *ibid.*, note: H. W. Bates, *l. c.*

Tæniotes præclarus, p. 197, Chontales, New Granada, *buckleyi* and *nævius*, Ecuador, p. 198, note: *id. l. c.*

Hammoderus elatus and *rubefactus*, id. *l. c.* p. 199, Chontales.

Pycnopsis obsoleta, Fåhræus, *l. c.* p. 39, Caffraria.

Ceroplesis marginalis, p. 39, *thunbergi*, p. 40: *id. l. c.*, Caffraria.

Tragiscoschema wahlbergi, id. *l. c.* p. 43, Caffraria.

Rhaphidopsis vittata, id. *l. c.* p. 44, Caffraria.

Eutænia picta, id. *l. c.* p. 46, Caffraria.

Barœus sundevalli, id. *ibid.*, Caffraria.

Heteroclytomorpha simplex, Lacordaire, *l. c.* p. 476, Philippines.

Coptops 4-stigma, Fåhræus, *l. c.* p. 30, Caffraria.

Alphitopola rugosipennis, id. *l. c.* p. 33, Caffraria.

Nœna[*to*]*schema thomsoni*, Fauvel, Bull. Soc. L. Norm. (2) i. p. 201, note, Lifu.

Dichostates stigmaticus, p. 37, *caffer*, *lacunosus*, p. 38: Fåhræus, *l. c.*, Caffraria.

Hecyrida sordida, p. 35, *tenebrio*[*no*]*ides*, p. 36: *id. l. c.*, Caffraria.

Mœchotypa umbrosa, Lacordaire, *l. c.* p. 519, note, Laos.

Nicomia leucoma, id. *l. c.* p. 536, note, Malasia.

Enaretta brevicornis, id. *l. c.* p. 589, note, Cape of Good Hope.

Cloniocerus constrictus, Fåhræus, *l. c.* p. 49, Caffraria.

Tautoclines griseicauda, H. W. Bates, *l. c.* p. 199, Chontales.

Adetus costicollis, id. *ibid.*, Chontales.

Eupogonius subæneus, p. 234, *flavicinctus*, *ursulus*, p. 235: *id. l. c.*, Chontales.

Amblesthis nemorensis, Fåhræus, *l. c.* p. 50, Caffraria.

Esthlogena porosa, H. W. Bates, *l. c.* p. 200, Chontales.

Estola perforata and *ignobilis*, id. *ibid.* Chontales.

Phacellus purpureus, Lacordaire, *l. c.* p. 665, note, Brazil.

Tybalmia cæca, p. 201, Chontales, *tetrops*, Upper Amazons, *ibid.*, note: H. W. Bates, *l. c.*

Ischiocentra heraldica, id. *l. c.* p. 201, Chontales.

Oncideres fulvistillata, id. *l. c.* p. 202, Chontales.

Onocephala obliquata, Lacordaire, *l. c.* p. 690, note, Brazil.

Hippopsicon debile, Fåhræus, *l. c.* p. 48, Caffraria.

Hyllisia vittata, p. 47, *gracilis*, p. 48, *id. l. c.*, Caffraria.

Amphicnæia brevivittis, p. 202, *crustulata*, p. 235, Chontales: H. W. Bates, *l. c.*

Trigonopeplus paterculus, Lacordaire, *l. c.* p. 718, note, Brazil.

Thryallis undatus (*Tragomorphus id.*, Dej.), *id. l. c.* p. 720, note, Mexico.

Chalastinus pantherinus (*Trigonopeplus id.*, Dej.), *id. l. c.* p. 721, note, Cayenne.

Gymnocerus belti, H. W. Bates, *l. c.* p. 203, Chontales.

Oreodora canitogata, p. 203, *verrucosa*, *granulifera*, *c-album*, p. 204, *inscripta*, p. 205: *id. l. c.*, Chontales.

Macrophora lateralis, Lacordaire, *l. c.* p. 735, note, Brazil.

Alphus cavifrons, H. W. Bates, *l. c.* p. 206, Chontales.

Myoximorpha vidua, Lacordaire, *l. c.* p. 746, note, Brazil.

Stirastoma albiceps, H. W. Bates, *l. c.* p. 207, Chontales.

Acanthoderes inquinatus, p. 207, *rubripes*, *lævicollis*, p. 208: *id. l. c.*, Chontales.

Lagochirus cristulatus (?=*L. obsoletus*, Thoms.), *præcellens*, p. 209, *simplicicornis*, p. 210: *id. l. c.*, Chontales.

Leptostylus viriditinctus, p. 210, *hilaris*, *triangulifer*, p. 211, *macrostigma*, *pygialis*, *leucopygus*, p. 212, *cristulatus*, p. 213: *id. l. c.*, Chontales.

Dectes balteatus, Lacordaire, *l. c.* p. 775, note, Oajaca.

Cosmotoma viridanum, id. *l. c.* p. 781, note, St. Catharine.

Hylettus vindex, id. *l. c.* p. 788, note, Cayenne.

Alcidion brachiale (=*A. adjunctum*, Thoms.), H. W. Bates, *l. c.* p. 214, Chontales.

Lophopæum barbiscapum, p. 214, *scopiferum*, *saronoto* [sic], p. 215: *id. l. c.*, Chontales.

Ozineus arietinus, id. *l. c.* p. 215, Chontales.

Anisopodus argus, p. 216, *hamaticollis*, *scriptipennis*, p. 236: *id. l. c.*, Chontales.

Lepturges infilatus, *limpidus*, p. 216, *calligramma*, *navicularis*, *lætabilis*, p. 217, *festivus*, p. 236, *unilineatus*, *lætificus*, p. 237: *id. l. c.*, Chontales.

Baryssinus bicirrifer, id. *l. c.* p. 218, note, Rio Janeiro.

Trypanidius rubripes, id. *l. c.* p. 219, Chontales.

Nyssodrys punctatella, p. 219, *polygramma*, p. 220, *roseicollis*, *leucopyga*, p. 221: *id. l. c.*, Chontales.

Astynomus mucoreus, p. 221, *vexillaris*, *setiger*, p. 222: *id. l. c.*, Chontales.

Synchyzopus geometricus, id. *l. c.* p. 224, Chontales.

Colobothea chontalensis, *ramosa*, *unilineata*, p. 225, *dispersa*, *bilineta*, p. 226: *id. l. c.*, Chontales.

Eumidia puncticollis, *senilis*, p. 52, *rustica*, *strigata*, p. 53, *pygmæa*, *caffra*, *lurida*, p. 54; Fåhræus, *l. c.*, Caffraria.

Saperda haroldi, id. *l. c.* p. 55, Caffraria.

Nitocris necydaloides, *funesta*, p. 57, *lugens*, *nigricornis*, p. 58, *varicornis*, *pectoralis*, *pusilla*, p. 59: *id. l. c.*, Caffraria.

Dyenmonus apicalis and *analis*, id. *l. c.* p. 56, Caffraria.

Carneades glaucothea, p. 227, note, *princeps*, p. 238: H. W. Bates, Ecuador.

Phœa scuticollis, p. 227, *lineola*, p. 228, Chontales, *rufiventris*, *vitticollis*, *tenuata*, *semirufa*, Mexico, *ibid.*, note: *id. l. c.*

Lycidola belti, id. *l. c.* p. 228, Chontales.

Hemilophus prolixus, id. *l. c.* p. 229, Chontales.

Isomerida picticornis and *subdilatata*, id. *l. c.* p. 229, Chontales.

Amphionycha princeps and *albaria*, id. *l. c.* p. 230, Chontales.

Phaula thomsoni, Lacordaire, *l. c.* p. 898, note, Minas.

Antodyce cretata, H. W. Bates, *l. c.* p. 232, Chontales.

Callia fauveli, J. Thomson, Bull. Soc. L. Norm. (2) i. p. 203, note, pl. i. fig. 16, Lifu; *C. minuta*, H. W Bates, *l. c.* p. 238, Chontales.

CHRYSOMELIDÆ.

Sagrides.

Sagra splendida, F.: economy in connexion with *Dioscoræa batatas* noted by Lucas, Bull. Soc. Ent. Fr. (5) ii. p. xciii.

Donaciides.

Donacia phellandrii, Sahlb., *ex. typ.*, = *dentata*: Kraatz, B. E. Z. xvi. p. 271.

Donacia nitida, Germ., redescribed; *D. cærulea*, Ol., Lac., redescribed from Illinois, apparently = *carolina*, Lac., var.; *D. æqualis*, Say, redescribed, that author having apparently mixed *D. confusa*, Lac., with it. *D. subtilis*, Kunze, and its synonyms discussed; a species from Illinois described, and dubiously referred to *fulgens*, Lec.; and various incidental observations on the position, synonymy, &c., of other North-American species made. Suffrian, S. E. Z. xxxiii. pp. 11–22.

Hæmonia. The silky pubescence probably assists in retaining air under the elytra when the insect is submerged. Fauvel, Bull. Soc. L. Norm. (2) v. p. 347.

Hæmonia mosellæ, Bellev., = *chevrolati*, Lac.: Bedel, Bull. Soc. Ent. Fr. (5) ii. p. li (= *equiseti*, F.: Leprieur, *ibid.* note).

Donacia pubicollis, Suffrian, *l. c.* p. 21, Illinois; *D. glabrata* and *sibirica*, Solsky, Hor. Ent. Ross. viii. p. 245, E. Siberia: spp. nn.

Criocerides.

Lema puncticollis: economy in connexion with *Cirsium arvense*, by Rupertsberger, Verh. z.-b. Wien, xxii. p. 20.

Clythrides.

KRAATZ, B. E. Z. xvi. pp. 193–232, revises the European species on the basis of Lacordaire's treatment. *Labidostomis taxicornis*, Lac., is apparently not found in Germany; *L. tibialis*, Lac. (*nec* F., = *lacordairii*, Rche.), = *lusitanica*, Germ.; a form of *L. meridionalis*, Lac., from the Eastern Pyrenees is named *pyrenæa*, p. 197; *L. bigemina*, Suffr., is adopted for the anterior *quadrimaculata* of Mots., which clashes with the Linnæan *Clythra*; *L. distinguenda*, Ros., and ? *pilicollis*, Lac., = *pallidipennis*, Gebl.; *L. limbata* and *hebræa*, Lac., are probably the same species; a middle form, apparently connecting *L. humeralis*, Sch., and *tridentata*, L., is recorded from the Rhine; *L. axillaris*, Lac., = *lucida*, Germ.; *Macrolenes bellieri*, Rche., is distinct from *ruficollis*, F.; a var. of *Titubæa* 6-*maculata*, F., from Andalusia is described; *T. dispar*, L., = 6-*punctata*, Ol., of which *umbellatarum*, Ol., is a var., *biguttata*, Ol., the ♂, and *dispar*, Luc., a ♂ var.; *Clythra maculicollis*, Brullé, = *T. dispar*, Lac., var. A; *Lachnæa vicina* is not German, but has been confused with *tripunctata*, F.; *tripunctata*, Lac., *nec* F., is named *suffriani*, p. 210; *L. hirta*, F., is now rightly recorded as European; *Coptocephala tibialis*, Brullé, sinks as a var. of *Gynandrophthalma bioculata*, Lac. (*tibialis* being also preoccupied); *G. diversipes*, Letz., seems a good species; the species of *Coptocephala* are discussed at length, and finally restricted to 10, viz. *apicalis*, Lac. (? *hæmorrhoidalis*, Stev.), *chalybæa*, Germ., *unicolor*, Luc.

(possibly not distinct from *chalybæa*), *gebleri*, Gebl. (4-*maculata*, F., *nec* L.), 4-*maculata*, L. (of which *femoralis*, Küst., and *maculiceps*, Ktz., are varr.), *scopolina*, F. (of which *plagiocephala*, F., is a var.), *melanocephala*, Küst., *nec* Ol., named *kuesteri*, p. 230, *melanocephala*, Ol. (6-*notata*, F.), *cyanocephala*, Luc., and *rubicunda*, Laich. (*tetradyma*, Küst., and of which *floralis*, Ol., *bi-trimaculata*, Küst., and *plagiocephala*, Germ., are varr.).

Lefèvre, Ann. Soc. Ent. Fr. (5) ii. pp. 49–168, 313–396 (sep. paging 1–204), pls. 1–4, monographs the species found in Europe and the Mediterranean basin. [The author differs from all other writers in spelling the typical genus "*Clytra*," and follows the same root in its compounds. He gives the derivation thus:—"? κλυτός, *beau*;" but, without pointing out the difficulty of getting the letter *r* from that root, it is obvious that the name was given on account of the cases made by the species, and that it comes from one of the forms commencing κλειθρ- (from κλείω, to shut), giving *Clithra*, instead of *Clythra*, as usually received.] A var. of *Titubæa* 6-*maculata*, F., from Jerusalem, is described under the name *fulvipes* (p. 123), apparently connecting *macropus*, Ill., with that species; and the author suggests that both these and *illigeri* and *parviceps*, Lac., may be only modifications of one and the same type. *T. dispar*, Lac., is retained as a var. of 6-*punctata*, Ol. A var. of *T. paykulli*, Lac., is described (p. 129) under the name *fasciata*. *Clythra algerica*, Desbr., = *laticollis*, Ol., var. *Gynandrophthalma* is stated to be of less southern distribution than others of the group, and to reach to England [this latter statement is quite incorrect]. *G. hellenica*, Mars., *ex. typ.*, = *tibialis*, Brullé; *G. limbata*, Stev., = *dorsalis*, Ol., and *dorsalis*, Dej., is named *plagiata*. *Chilotoma raffrayi*, Desbr., is a *Gynandrophthalma*. *Cyaniris unicolor*, Luc., = *Coptocephala chalybæa*, Germ.

The author, pp. 383–386, referring to the almost simultaneous publication of Kraatz's work on the same family, demurs to the association by the latter of *Labidostomis lusitanica*, Germ., with *lacordairii* (*tibialis*, Lac.), and of *L. distinguenda*, Rosenh., with *pallidipennis*; he refers *L. kindermanni*, Ktz., to *maculipennis*, Lef. (1870), and his own *diversifrons*, with doubt, to *speculifrons*, Ktz.; records *L. guerini* from Algeria; affirms the identity of *L. pelissieri* (Buq.), Ktz., with *lejeunii*, Fairm.; describes eggs of *L. taxicornis* and *trifoveolata*; describes an Algerian var. of *Titubæa illigeri*, Lac.; refers *Calyptorhina andalusica*, Heyd., to *Otiocephala opaca*, Ros.; maintains the specific distinctness of *Gynandrophthalma tibialis*, Brullé, and *bioculata*, Lac.; and retains *scopolina*, L., for *Coptocephala unifasciata*, Scop., which, though prior, cannot be identified with certainty with the Linnean species.

Besides certain of the species described as new, the following are figured:—Pl. 1, *Labidostomis* 4-*notata*, Fab., ♂ and ♀ var., *bigemina*, Suffr., ♂, *lejeunii*, Fairm., ♀, and various details of *L. lacordairii*, *rufa*, *taxicornis*, *lucida*, *decipiens*, *diversifrons*, *pallidipennis*, *pilicollis*, and *lepida*; pl. 2, *Titubæa illigeri*, *olivieri*, *paykulli*, Lac., 13-*punctata*, Desbr., and details of *T.* 6-*maculata* and 8-*punctata*, *Macrolenes ruficollis*, and *bellieri*, *Clythra læviuscula*, 4-*punctata*, *valerianæ*, and *appendicina*; pl. 3, details of *Barathræa cerealis* and *straminei-pennis*, *Lachnæa pubescens*, 3-*punctata*, *vicina*, *longipes*, and *cylindrica*, *Calyptorhina chloris*, and *Otiocephala opaca*; pl. 4, *Gynandrophthalma dorsalis*, Ol., *collaris*, F., *menetriesi*, Fald., *coptocephaloides*, Lac., and details, *Coptocephala æneipicta*, Fairm., ♂, and details of *G. viridana* and *concolor*, *Chilotoma*

musciformis, *erythrostoma*, and *reyi*, *Coptocephala melanocephala*, *4-maculata*, *fossulata*, and *scopolina*.

For review of Lefèvre's work, especially on the nomenclature employed, *cf.* v. Harold, C. H. x. pp. 217 & 218; and for criticisms on his derivations, *cf.* de Marseul, Nouv. et Faits, p. cxliii.

Clythra 4-punctata: case from nest of *Formica rufa*, F. J. M. Heylaerts, Tijdschr. Ent. (2) vii. p. xxi; larva and case (which is not hairy) described by R. Hislop, Ent. M. M. viii. p. 269.

Otiocephala, g. n., Lefèvre, *l. c.* p. 317. Differs from *Calyptorhina* in having the head elongated under each eye into a stout perpendicular ear-piece, the structure of the epistoma, mandibles, and scutellum, &c. *Labidostomis forcipifera*, Luc., and *Clythra opaca*, Rosenh. (with which *Barathræa lethierrii*, Chevr., and *Gynandrophthalma bisbipunctata*, Desbr., are identical).

Labidostomis speculifrons, p. 200, Asia Minor, *kindermanni*, p. 201, Syria, *pelissieri*, p. 205, Algiers (probably a local form of *guerini*, Bassi), Kraatz, *l. c.*; *L. cavifrons*, p. 80, Tangiers, *metallica*, p. 83, *rugicollis*, p. 86, S. Russia, *diversifrons*, p. 90, pl. 1. fig. 5, Beyrout, S. Russia, *lepida* [preoccupied by Lacordaire], p. 94, pl. 1. figs. 19 & 20, Russia, *maroccana*, p. 380, *lucaniformis*, p. 381, Morocco, Lefèvre, *l. c.*: spp. nn.

Titubæa nigriventris, sp. n., Lefèvre, *l. c.* p. 136, pl. 2. fig. 5, Russia (? = *sericea*, Ol.).

Calyptorhina biornata (? Kinderm.), *id. l. c.* p. 322, Amasia, Diarbékir.

Gynandrophthalma græca, Kraatz, *l. c.* p. 217, Greece (? = *affinis*, Ill., var.); *G. scutellaris*, p. 335, pl. 4. fig. 2, Syria, *manicata*, p. 341, Spain, *judaica*, p. 342, Syria, *græca*, p. 346, Mt. Parnassus, *djebellina*, p. 349, pl. 4. fig. 3, Syria, Beyrout, *brevicornis*, p. 351, pl. 4. fig. 4, Oran, Portugal, Lefèvre, *l. c.*: spp. nn.

Coptocephala quinquenotata, p. 364, pl. 4. fig. 18, Corsica, *fossulata*, p. 372, Sicily: *id. l. c.*, spp. nn.

Eumolpides.

Colaspis flavida, Say. Larva redescribed fully, and figured in detail: C. V. Riley, iv. Rep. Ins. Mo. p. 34, fig. 16.

Pseudocolaspis and *Pachnephorus*. Observations on real and reputed European species by Kraatz, B. E. Z. xvi. pp. 187–190, who criticizes Schaufuss. *Pseudocolaspis setosa*, Lucas (1847), = *cylindrica*, Küst. (1846, as *Pachnephorus*); *Pachnephorus cylindricus*, Luc. (1849), does not clash.

Cryptocephalides.

Cryptocephalus. Von Harold, C. H. x. p. 254, changes *C. imperialis*, F., *nec* Laich., to *primarius*; *nitidulus*, Gyll., *nec* F., to *ochrostoma*; *ruficollis*, Ol., *nec* F., to *erythroderes*; *lundi*, Ol., *nec* F., to *olivieri*; *ocellatus*, Suffr., *nec* Drap., to *subtilis*; *fasciatus*, H.-S., *nec* Say, to *sinuatus*; *trivittatus*, Gebl., *nec* Ol., to *illaicus*; 8-*punctatus*, Ol., *nec* Scop., to *capensis*; *pulchellus*, Suffr., *nec* Saunders, to *blandulus*; *melanocephalus*, Suffr., *nec* Saund., to *mucidus*.

Cryptocephalus (*Ochrosopsis*) *erosus*, Seidlitz, *nec* Saunders, is renamed *excisus* by its author, C. H. x. p. 254.

Cryptocephalus frontalis occurs in profusion at Marly on sallows of one year's growth: Leprieur, Bull. Soc. Ent. Fr. (5) ii. p. xl.

Coptocycla reticulata, F., *nec* Thunb., is renamed *retexta*: v. Harold, *l. c.*

Pachybrachys viridissimus, Suffr., *elegans*, Graells, *regius*, Schauf., are colour-varr. of *azureus*, Suffr.: Perez Arcas, An. Soc. Esp. i. p. 119.

Cryptocephalus tetrathyrus, p. 248, *liothorax*, p. 250, *peliopterus*, p. 251, E. Siberia: Solsky, Hor. Ent. Ross. viii., spp. nn.

Pachybrachys ochropygus, sp. n., *id. l. c.* p. 253, E. Siberia.

Chrysomelides.

Doryphora 10-*lineata*. Additional particulars as to its habits, new remedies, and the following insects first recorded as parasitic upon it:—*Mysia* 15-*punctata*, *Hippodamia glacialis*, *Perillus circumcinctus*, *Euschistus punctipes*, *Promachus bastardi*: C. V. Riley, iv. Rep. Ins. Mo. pp. 5–22, figs. 4–9. It does not progress westward: Horn, in Hayden's Geol. Surv. of Montana, p. 384.

Timarcha rugipennis, Per. Arcas, is distinct from *T. hispanica*, H.-Sch.: Perez Arcas, An. Soc. Esp. i. p. 123.

Gonioctena pallida. Economy, in connexion with *Prunus padus*, by v. Frauenfeld, Verh. z.-b. Wien, xxii. p. 394.

Phædon omissum, Sahlb., *ex. typ.*, = *cochleariæ*, F., Suffr., Thoms.; *P. cochleariæ*, Sahlb., = *betulæ*, Suffr. (*armoraciæ*, L., *cochleariæ*, Gyll., *sec.* Thomson): Kraatz, B. E. Z. xvi. p. 272.

Cyrtonus denticulatus, Chevrolat, Nouv. et Faits, p. cxxxii, Spain; *C. cupreivirens*, Perez Arcas, *l. c.* p. 134, pl. 3. fig. 3, Arragon: spp. nn.

Timarcha splendida, sp. n., Perez Arcas, *l. c.* p. 121, pl. 2. fig. 5, Spain.

Chrysomela graellsi, sp. n., *id. l. c.* p. 124, pl. 2. fig. 6, Spain.

Chrysomela nigripunctata, sp. n., Reitter, B. E. Z. xvi. p. 175, Oran (= *bicolor*, F., var., *ex. typ.*: Kraatz, *ibid.* p. 186).

Galerucides.

Lyperus megalophthalmus, Joannis: ♀ described, from Mont Cenis. A var. ♀ of *L. flavipes*, from Corsica, named *maculicornis*. *L. geniculatus*, Joann., = *nigripes*, Kies., var. *Adimonia dispar*, Joann., is better united to *tanaceti*. Desbrochers, Ann. Soc. Ent. Fr. (5) ii. p. 431.

Adimonia capreæ, L.: the v. β, Joannis, from E. Siberia, named *cribrata*. Solsky, Hor. Ent. Ross. viii. p. 256.

Adimonia cicatricosa, Chevrolat, Nouv. et Faits, p. cxxxi, Spain; *A. vicina*, Solsky, *l. c.* p. 255, E. Siberia: spp. nn.

Galerucida flavipennis, sp. n., Solsky, *l. c.* p. 257, E. Siberia.

Halticides.

Longitarsus luridus. Rupertsberger, Verh. z.-b. Wien, xxii. p. 20, describes the larva (from *Rhinanthus alectorolophus*) and pupa.

Thyamis agilis, Rye, feeds on *Scrophularia aquatica*: E. C. Rye, Ent. Ann. 1873, p. 7.

Psylliodes luteolus, Müll., occurs in galls on oaks at Arnstadt: Kellner, B. E. Z. xvi. p. 162.

Epiotis, g. n., Solsky, Hor. Ent. Ross. viii. p. 259. Facies of *Agelastica*

alni, or of certain species of *Œdionychis*. *Œ. plagioderoides*, Mots., Japan (redescribed fully, p. 260).

Thyamis distinguenda, sp. n., Rye, Ent. M. M. ix. p. 157, England.

Hispides.

Hispa quadrata, F. The larva mines leaves of *Tilia americana*; and that of *H. inæqualis*, Web., mines the leaves of *Eupatorium ageratoides*: V. T. Chambers, Canad. Ent. iv. p. 125.

Hispa angulosa, sp. n., Solsky, Hor. Ent. Ross. viii. p. 263, Baikal, or south of the Amour.

Cassidides.

Baly, Tr. E. Soc. 1872, p. 59 *et seq.*, describing new species from Ecuador, remarks on their similarity of markings and coloration, although they belong to different genera. He describes a var. of *Calaspidea colossa*, Boh., from Ecuador, p. 62.

Cassida equestris, *nobilis*, and *margaritacea*. Rupertsberger, Verh. z.-b. Wien, xxii. pp. 22, 23, & 25, describes the earlier stages of these species, the first of which occurs on *Mentha aquatica* and *arvensis*, *Galeopsis tetrahit*, *Salvia glutinosa*, and *Cirsium arvense*; the second and third on *Silene inflata* (the second also on *Spergula*). *C. vittata*, a black var. from Hamburg: H. Beuthin, B. E. Z. xvi. p. 162. *C. murræa*, almost entirely black: J. Weise, *ibid.* p. 158.

Cassida concha, sp. n., Solsky, *l. c.* p. 264, Lake Khanka, E. Siberia.

Dolichotoma instabilis, p. 59, *sericea*, p. 60, Ecuador: Baly, *l. c.*, spp. nn.

Calaspidea contacta, sp. n., *id. l. c.* p. 61, Ecuador.

Mesomphalia deliciosa, *pauperula*, p. 62, *buckleyi*, p. 63, *pectinata*, p. 64, *pascoii*, p. 65, *interjecta*, *perjucunda*, p. 66, *emorsitans*, p. 67, *latissima*, p. 68, *pæcilasp*[*id*]*oides*, p. 69, Ecuador, *consociata*, p. 68, Bolivia: *id. l. c.*, spp. nn.

Omaspides bivittata and *abbreviata*, spp. nn., *id. l. c.* p. 70, Ecuador.

Batonota distincta, Ecuador, *jansoni*, Nicaragua: *id. l. c.* p. 71, spp. nn.

Erotylidæ.

Encaustes. Bedel confirms Erichson's observations as to the existence of *two* teeth on the inner lobe of the maxillæ. He adds localities for his *Aulacochilus tetraphacus*, *sericeus*, and *micans*, and renames as *motschulskii* the *Triplax melanocephala* of Mots., *nec* Latr.: Ann. Soc. Ent. Fr. (5) ii. pp. 407 & 408.

Dacne moravitzi, sp. n., Solsky, Hor. Ent. Ross. viii. p. 266, E. Siberia.

Triplax amœna, p. 269, E. Siberia, *gracilenta*, p. 271, ? Baikal: *id. l. c.*, spp. nn.

Aulacochilus brevis, p. 403, *niger*, p. 407, Malacca, *tetradyma*, p. 404, Pulu-Penang, *oceanicus*, p. 405, Ceram, New Guinea: Bedel, *l. c.*, spp. nn.

Coccinellidæ.

Pellet, Bull. Soc. Pyrén. xix. 1872, pp. 36 (reviewed Nouv. et Faits,

p. cl), gives an account, founded on Mulsant's work, of the genera and species observed in the Perpignan district, with details of economy.

Anatis ocellata. Varr. with confluent spots more frequent than the type at Koultouk, some having a transverse plica on the hinder part of the elytra, as in *Coccinella variabilis*. Seven varr. of ? *Leis frigida*, Muls., described from E. Siberia and China. Solsky, Hor. Ent. Ross. viii. pp. 272–275.

Cydonia vicina, Muls., recorded from St. Helena: T. V. Wollaston, Ann. N. H. (4) x. p. 113.

Scymnus arcuatus, Rossi, recorded from Mid-England: *id.* Ent. M. M. ix. p. 117.

Ithone, g. n., Solsky, *l. c.* p. 275. Differs from *Synonycha* in its bifid claws, and from *Leis* in its deeply sinuated and laterally strongly toothed epistoma. Most nearly allied to *Neda*, Muls. *Leis mirabilis*, Mots., south of the Amour.

Calvia deflorata, sp. n., *id. l. c.* p. 272, Vladivostok (?=*C. hololeuca*, Mots., MS.).

Chilomenes 12-punctata, sp. n., Fauvel, Bull. Soc. L. Norm. (2) i. p. 209, note, Lifu.

Rhizobius subdepressus, sp. n., Seidlitz, Fauna Baltica, p. 193, Germany, Pyrenees.

HYMENOPTERA

By E. C. Rye.

Marshall, T. A. A Catalogue of British Hymenoptera; Chrysididæ, Ichneumonidæ, Braconidæ, and Evaniidæ. London: 1872, 8vo, pp. viii & 136.

Published by the Entomological Society of London, being a 3rd part of a proposed general Catalogue of the Insects of the British Isles. Of the *Chrysididæ*, 6 genera and 22 species are enumerated; of the *Ichneumonidæ*, 136 genera and 1186 species; of the *Braconidæ*, 125 genera and 439 species; and of the *Evaniidæ*, 4 genera and 7 species: in all, 271 genera and 1654 species. Complete synonymical and bibliographical references are given. Reviewed by J. W. Dunning in Ent. M. M. ix. p. 221 *et seq.*; notes by author, in Tr. E. Soc. 1872, pp. 259–264, detailed observations from which will be hereafter noticed. Various orthographic corrections are pointed out, and at pp. 263 & 264 is a list of species doubtfully British.

Radoszkowsky, O. de B. Hyménoptères de l'Asie. Description et énumération de quelques espèces reçues de Samarkand, Astrabad, Himalaya, et Ning-Po, en Chine. Hor. Ent. Ross. viii. pp. 187–200.

10 species taken by Fedtschenko in Zaravchan, 36 by Felder from the Himalayas and China, and 40 by Haberhauer from Astrabad. Some are new.

——. Supplément indispensable à l'article publié par M.

Gerstaecker en 1869, sur quelques genres d'hyménoptères. Bull. Mosc. xlv. 1, pp. 1–40, pl. 1.

Relates chiefly to the "Philérémides" of Lepelletier.

Snellen van Vollenhoven, S. C. Schetsen ten Gebruike bij de Studie der Hymenoptera. I. Ichneumoniden, pls. i.–iii. (1868); II. Braconiden, pls. iv.–vi. (1869); III. Pteromalinen, pls. vii.–x. (1871). 'S Gravenhage: oblong 4to.

Each part consists of an introductory page and outline figures, with occasional details, of the most remarkable genera.

Thomson, C. G. Hymenoptera Scandinaviæ. Lund: 8vo, i. 1871, pp. 1–342; ii. 1872, pp. 285, 1 pl.

Vol. i. (reviewed in Ent. M. M. viii. p. 189) comprises *Tenthredo* and *Sirex*, Linn., and commences a proposed monographic revision of the Swedish species of *Hymenoptera*. Vol. ii. comprises *Apis*, Linn. As usual, the author is original in his treatment: his habit of investigating *all* portions of the structure of any insect to which his attention is directed, and of not confining himself to any one set of organs, causing him frequently to arrive at conclusions at variance with those of former writers. In discussing the *Tenthredinidæ*, however, he omits to notice the larval stage, in spite of Dahlbom's valuable observations upon it.

Kräplin, Tagebl. xlv. Vers. Natur. p. 140, notes the homology between the last abdominal segments of the ♂ and ♀.

Japan (Hiogo). In a collection received from this country, all the genera (except one of *Formicidæ*) were European, and some of the species appeared to be identical with European: F. Smith, P. E. Soc. 1872, p. xx. But the collective faunas of the two regions are totally distinct: H. W. Bates, *ibid.* p. xlvii.

Apidæ.

Thomson, Hym. Scand. ii., adopting as primary the sections *Sociales* and *Solitariæ*, comprises in the former the tribes *Apina* and *Bombina*, and in the latter the equivalent tribes of *Megillina*, *Andrenina*, *Halictina*, *Nomadina*, and *Melectina*. For all of these he points out fresh characters, derived from varied structural peculiarities.

F. Rudow, S. E. Z. xxxiii. pp. 414–429, recapitulates the species of the Lower-Harz district, with brief notices of habits, times of appearance, &c.

Andrenides.

Dours, R. Z. (2) xxiii. pp. 293, 349, 396, 419, *et seqq.*, under the title of "Hyménoptères nouveaux du bassin méditerranéen," describes various new species of this group (many by L. Dufour & Sichel, unpublished before).

Hylæus. Morawitz, Verh. z.-b. Wien, xxii. p. 374 *et seq.*, reviews Förster's monograph, adding to it 9 European species already recorded. *H.*

schencki, Först., = *rinki*, Mor., = *annularis*, Schenck, = *distans*, Eversm.; *H. barbatus*, Först. (♂), = *annulatus*, Mor., = *patellatus*, Eversm., = *borealis*, Nyl.; *H. nivalis* and *alpinus*, Mor., are recorded as occurring in Germany.

Hylæus hyalinatus, Först., = *armillatus*, Nyl.; *H. confusus*, Först., *nec* Nyl., is renamed *genalis*, p. 124; *H. annularis*, Först., = *confusus*, Nyl.; *H. subfasciatus*, Först., = *difformis*, Eversm., ? = *marginatus*, Thoms. (? *subfasciatus*, Schenck); *H. pictipes*, Nyl., is adopted for *annularis*, Kby.; *H. barbatus*, Först., = *annulatus*, L.; *Prosopis dilatata*, Puton, = *H. clathratus*, Thoms., = *gerstæckeri*, Hensel, = *rinki*, Gorski [*cf.* Z. R. viii. p. 332]: Thomson, *l. c.*

Halictus abdominalis, Thoms., = *cylindricus*, F.; *H. rufitarsis*, Thoms., *nec* Zett., = *punctulatus*, Kby.; wings and patella of posterior tibia of *Halictus*, figs. 1, 2, 3: *id. l. c.* p. 140. *H. pollinosus*, Sichel, ♀, = *mucoreus*, Eversm.: Morawitz, *l. c.*

Nomia. Gerstäcker, S. E. Z. xxxiii. pp. 298–308, revises the European species.

Andrena intermedia, Mor., *nec* Thoms., = *bicolor*, Nyl., *nec* F., is renamed *moravitzi*, p. 78; *A. flessæ*, Thoms., is renamed *nigrispina*, p. 80; *A. melanocephala*, Thoms., = *vitrea*, Smith; *A. angulosa*, Kby., is separated from *helvola* as a good species; *A. angustipes*, Schenck, ? = a stylopized individual of *lapponica*, Zett.; *A. squamea*, Gir., ? = *curvungula*, Thoms.; *A. nasalis*, Thoms., = *fulvescens*, Smith, ♂: Thomson, *l. c.* *A. calabra*, Costa, redescribed from Samarcand: Radoszkowsky, Hor. Ent. Ross. viii. p. 188.

Lucasius, subg. n. of *Halictus*, Dours, *l. c.* p. 350. Transitional between *Halictus* and *Systropha*. *L. clavipes*, p. 351, pl. xxviii. fig. 5, Algeria, S. France, Grecian archipelago, *cochleitarsis*, p. 352, fig. 4, Montpelier: *id. l. c.*, spp. nn.

New species:—

Colletes alpinus, Morawitz, *l. c.* p. 372, Tyrol; *C. niveifasciatus*, p. 295, *collaris*, p. 296, Cannes, Algeria, Greece, *lacunatus*, p. 297, Algeria, S. France, *dentiventris* and *acanthopygus*, p. 298, Algeria, Dours, *l. c.*; *C. picistigma*, Thomson, *l. c.* p. 165, Gothland, Scania.

Hylæus submarginatus, Thomson, *l. c.* p. 130, Gothland (? = *H. angustatus*, Sch., Först.); *H. glacialis*, Morawitz, *l. c.* p. 379, Tyrol.

Prosopis luteibalteata, p. 293, *niveifasciata*, p. 294, Algeria: Dours, *l. c.*

Halictus formosus, p. 300, pl. xxviii. fig. 1, *ferrugineizonatus*, p. 301, *allizonatus*, *soreli*, fig. 2, p. 302, *ochraceivittatus*, p. 303, *sexcinctellus*, p. 305, *platycestus*, p. 306, fig. 3, *griseizonatus*, p. 308, *semipubescens*, p. 309, *gemmeus*, p. 310, *carneiventris*, p. 311, *bimaculatus*, p. 349, Algeria (some also in S. France), *aureipes*, p. 307, Grecian Archipelago, Dours, *l. c.*; *H. porcus*, p. 369, Meran, Graz, *puncticollis*, p. 370, Badenweiler, Bamberg, *pleuralis*, Creuznach, *griseolus*, Meran, p. 371, *glabriusculus*, p. 372, Bamberg, Meran: Morawitz, *l. c.*

Nomia valga, Andalusia, *equestris*, Xante: Gerstäcker, *l. c.* p. 302.

Andrena elongata, Radoszkowsky, Hor. Ent. Ross. viii. p. 197, Astrak.; *A. nigribarbata*, p. 217, Dalmatia, *inconspicua*, p. 218, *croceiventris*, p. 219, *orbitalis*, p. 224, Calabria, *transitoria*, p. 220, *erberi*, p. 222, Syra, *mucronata*, p. 224, Corfu: Morawitz, *ibid.*; *A. alpina*, p. 364, Tyrol, *favosa*, p. 365, Piesting, *rogenhoferi*, Alps, *tscheki*, Piesting, p. 366, *ochracea*, p. 367, Creuz-

nach, Vienna, *æneiventris*, p. 368, Meran: *id.* Verh. z.-b. Wien, xxii.; *A. mesopyrrha*, p. 353, *basalis*, p. 354, *picciolii*, p. 356, *fonscolombii*, p. 357, Grecian archipelago, *atrirubricata*, p. 358, *arietina*, p. 396, pl. xxviii. figs. 6 & 7, *melanaria*, p. 397, *nigrisericea*, p. 398, *soror*, p. 419, *heteroxantha*, p. 420, *insolita*, p. 422, *chrysopyga*, p. 423, fig. 10, *succinea*, p. 424, fig. 11, *nigristincta*, *planiventris* (figs. 12 & 13), p. 426, *griseibalteata*, p. 427, *boyerella*, *gravida*, fig. 14, p. 429, *poupillieri*, p. 430, *ferrugineicrus*, p. 431, *ustulata*, p. 432, *rufihispida*, p. 433, Algeria (some also from S. Europe), *piceicornis*, p. 421, fig. 9, *trachyderma*, p. 425, *strigosa*, p. 428, S. France: Dours, *l. c.*

Dasypoda rufipes, Morawitz, Hor. Ent. Ross. viii. p. 216, Dalmatia.

Dasypoda rufipes, Dours, *l. c.*, Grecian archipelago, Spain, Algeria.

Apides.

Morawitz, Verh. z.-b. Wien, xxii. p. 354 *et seq.*, refers to the following species as new to the German fauna, or hitherto only known to occur in isolated localities, and gives the synonymy here recorded:—*Anthophora canescens*, Brullé (*Apis grisea*, Christ., ♀=*Anth. nigricincta*, Lep.), *flabellifera*, Lep. (♂=*pubescens*, Lep.), and *albigena*, Lep.; *Tetralonia ruficornis*, F. (♂=var. *alticincta*, Lep.), and *pollinosa*, Lep. (=var. ♀ *tricincta*, Lep.); *Chalicodoma pyrrhopeza*, Gerst., var. *alpina*; *Megachile ursula*, Gerst. (with which *nigriventris*, Schenck, is probably identical), *analis*, Nyl., and *imbecilla*, Gerst.; *Osmia solskii*, *confusa*, *panzeri*, and *loti*, Mor., *emarginata*, Lep. (=*mustelina*, Gerst., ♀; nest mentioned at p. 359), *corticalis* and *platycera* (nest, p. 360), Gerst., *rufihirta*, Latr., and *tuberculata*, Nyl. (♀=*cylindrica*, Gir.; ♂ redescribed, p. 362); *Heriades foveolata*, Mor.; *Anthidium 7-dentatum* and *laterale*, Latr., and *montanum*, Mor.; *Ceratina callosa*, F., and *dentiventris*, Gerst.; *Rophitoides canus*, Eversm.; *Dufourea halictula*, Nyl., and *alpina*, Mor.; *Halictoides paradoxus*, Mor. (♀ now first described, p. 364, from the Prader-Alp, on *Phyteuma scheuchzeri*); *Panurginus montanus*, Gir.; *Nomada ferruginata*, L., var. *major* (with *Andrena ochracea*), *mutabilis*, *cinnabarina* (redescribed, p. 384) and *femoralis*, Mor., and *fuscicornis*, Nyl. (parasitic on *Panurgus lobatus*), and *Epeolus speciosus*, Gerst.

Osmia vulpecula, Gerst., =*inermis*, Zett., ♀; *O. corticalis*, Zett., =*nigriventris*, Zett.; *O. xanthomelana*, Gerst. (*nec* Kby.), =*pilicornis*, Smith; *O. interrupta*, Schenck, =*leucomelana*, Nyl., *nec* Kby., is renamed *claviventris*, p. 254; *O. cylindrica*, Gir., =*tuberculata*, Nyl.: Thomson, Hym. Scand. ii.

Osmia canadensis, Cresson, destructive to strawberry plants: Saunders, Canad. Ent. iv. p. 237, fig. 14.

Radoszkowsky, Hor. Ent. Ross. viii. Bull. pp. xvi–xviii, considers that the different structure of the nest in *Chalicodoma*, *Megachile*, and *Osmia* is one of the generic characteristics, and points out differences in the maxillary palpi, which are 3-jointed in the first two, 5-jointed in the last, and 4-jointed in a proposed new genus, *Pseudosmia*, of which the other characters are briefly exposed (published Nov. 1872). He considers Gerstäcker wrong in placing *Megachile lefevrii* and *M. pyrrhopeza* in *Chalicodoma*. In the claws of anterior tarsi of ♀ *Megachile lagopoda*, *ligniseca*, *maxillosa*, and others, there is a small auxiliary mobile denticle; in ♂ of *Osmia* and *Megachile* the inner claw is always the shorter; in *Chalicodoma* the claws are of equal length.

Megachile ligniseca, Nyl., *nec* Kby., is renamed *curvicrus*, Thomson, *l. c.* p. 223,

M. combusta, Sm.; economy described, from Natal: Taschenberg, Z. ges. Naturw. xxxix. pp. 7–10. *M. brevis*, Say, figured, and habits noted, by Reed, Rep. Ins. Ont. i. pp. 24–26, fig. 22. *M. centuncularis*: habits described by R. Walker, Scot. Nat. i. p. 222.

Anthidium. Walther Schmid, MT. schw. ent. Ges. iii. pp. 448–475, pl. –, describes the Swiss species, giving particulars of external anatomy, analytical tables, &c. The plate is of little value. This paper is severely criticized by A. Müller, Ent. M. M. ix. p. 95, from whose remarks it would appear that it is founded on unacknowledged MS. of the late W. Imhoff.

Nomada subcornuta, Kby., is separated from *lineola*, Panz., and *jacobææ*, Kby., var. *b*, is attributed to it as its ♂; *N. cornigera*, Kby., is also separated from *lineola*; *N. quinquespinosa*, Thoms., is compounded of *obscura* and *ochrostoma*, Nyl., *ochrostoma*, Zett. *pt.*, and ? *lateralis*, Sm., and *pallescens*, H.-S.; *N. læta*, Thoms., = *albiguttata*, var. *b*, H.-S., ? = *baccata*, Sm. (both are parasitic on *Andrena argentata*); *Apis leucophthalma*, L., is possibly to be referred to *N. borealis*, Zett.; *N. glabella*, Thoms., = *ochrostoma*, Zett., *pt.*; *N. punctiscuta*, Thoms., ? = *ochrostoma*, Mor., ? Kby.; *N. villosa*, Thoms., ? = *hillana*, Kby.; *N. xanthosticta*, Kby., = *lateralis*, Panz., *certe* [in which case either *xanthosticta* or *lateralis* of Smith requires renaming]: Thomson, *l. c.*

Epeoloides, Gir., recharacterized; maxillary palpi (6-jointed) of *E. ambiguus*, ♂ & ♀, figured, pl. 1. fig. 3; ♂ & ♀ of a species in the Vienna Museum noted as having only 2 cubital cells. *E. cæcutiens*, Gerst., *nec* F., = *fulviventris*, Schk., = *Saropoda fulva*, Eversm., = *ambiguus*, Gir., ♂. Radoszkowsky, Bull. Mosc. xlv. 1, p. 4 *et seq.*

Ammobates, Latr., recharacterized: maxillary palpi 6-jointed; those of *A. setosus*, Mor. (adopted for the prior *vinctus* of Gerstäcker, on account of the greater applicability of its name!), figured, pl. 1. fig. 1, and of *ruficentris*, Latr., fig. 2: *id. l. c.* p. 7 *et seq.*

Ammobatoides, Radosz., *nec* Schenck, is renamed *Paidia* [rectius *Pædia*] by Radoszkowsky, Hor. Ent. Ross. viii. Bull. p. xxi (Nov. 1872), and Bull. Mosc. xlv. p. 10. In the latter publication, the author severely (and apparently with justice) criticizes Gerstäcker's treatment of this genus; but it seems useless to give a fresh name for it in 1872, since Gerstäcker has employed the name *Phiarus* for it in 1869. The genus is recharacterized, and the 6-jointed maxillary palpi of both sexes of *P. abdominalis* and *melectoides*, and the anus of the former, ♀, figured, pl. 1. figs. 4 & 5, 6, and 16–16*b*. *P. hirsutulus*, Ev., is corroborated as *abdominalis*, ♂. *Euglages scripta*, Gerst., = *P. melectoides*, Rad. (? Smith), ♂: the author seems to prove that his *melectoides* is not identical with Smith's prior *Phileremus* of that name [if he be right in this, it is not improbable that *scripta*, Gerst., may have to stand]. *Id.* Bull. Mosc. xlv. i. p. 10 *et seq.*

Pasites, Latr., recharacterized: maxillary palpi (4-jointed) of both sexes of *P. schotti* and *punctata*, and anus of ♀ of both species figured, pl. 1. figs. 14–14*e*, and 15–15*b*. *Biastes*, Panz., though prior, is considered irr able, and *B. brevicornis*, Panz., is dropped in favour of *schotti*, F., as Panzer himself adopted the latter name, *Nomada atra*, F., being still considered doubtfu. as its ♂. *Phileremus nasutus*, Gerst., = *P. punctata*, Schenck. *Id. l. c.* p. 19 *et seq.*

Ammobatoides, Schenck, recharacterized: maxillary palpi of ♀ 3-jointed,

of ♂ 4-jointed; *Epeolus punctatus*, F., is probably a worn example of *A. bicolor*, Lep.: *id. l. c.* pp. 26–29, pl. 1. figs. 9 & 10.

Philoremus, Lep., recharacterized, and *P. oraniensis*, Lep., taken as the type; its maxillary palpi (2-jointed) figured, pl. 1. fig. 11. *P. punctatus*, Lep., is considered a myth. *Id. l. c.* p. 29 *et seq.*

Phiarus, Gerst. Radoszkowsky, *l. c.* p. 34, proposes (sarcastically) to adopt this name for the genus of *Pasites maculata*, Jur., not now recognized as a true *Pasites*, and of which *Nomada albimaculata* and *pusilla*, Luc., are varr., and *P. schotti*, Eversm., is ♀. *Ammobates kirbianus*, Rad., is suppressed.

Epeolus productus, Thoms., is parasitic on *Colletes daviesana* [so is *E. variegatus*, Sm.; Thomson's *variegatus* being parasitic on *C. impunctata*]: Thomson, Hym. Scand. ii. p. 211.

Cœlioxys acuta, ♀, *fissidens* and *fraterna*, ♂, Först., = *conica*, L.; *C. conoidea*, Gerst., = *punctata*, Lep., = *vectis*, Curtis; *C. trinacria* and *diglypha*, Först., = *rufescens*, Lep., ♀, of which *hebescens*, Nyl., Thoms., is a var.; *C. tricuspidata* and *divergens*, Först., = *simplex*, Nyl., ♀ & ♂; *C. lanceolata*, Thoms., = *acuminata*, Nyl.: *id. l. c.* p. 272 *et seq.*

Tetralonia graia, Eversm., redescribed: Morawitz, Hor. Ent. Ross. ix. p. 52.

Habropoda ezonata, Sm., = *Tetralonia tarsata*, Spin., *Anthidium mosaicum*, Costa, = *variegatum*, F.; *Saropoda fulva*, Eversm., ♀, ? = *Epeoloides cæcutiens*, F., ♂; *Eucera punctilabris*, Lep., ? = *clypeata*, Er.; *Macrocera nasalis*, Eversm., ? = *Melitturga clavicornis*, Latr.; *Heriades bidenticulata*, Costa, ? = *Osmia parvula*, Duf. & Perr.; *O. 4-cornis*, Kriechb., ? = *latreillii*, Spin.; *Rophites bifoveolatus*, Sich., ? = *canus*, Eversm.: *id. ibid.* p. 63.

Megilla, F. [1804], is adopted for *Anthophora*, Latr. [1803]; *Panurgus* is included in the *Andrenina*: Thomson, *l. c.*

Anthophora parietina, L. Nests described and figured by Cartereau, Ann. Soc. Ent. Fr. (5) ii. p. 307, pl. xi. Its parasites are *Melecta armata*, *punctata*, and *aterrima*, *Cœlioxys rufescens* (*Hym.*), and *Anthrax sinuata* (*Dipt.*).

Xylocopa. Gerstäcker, S. E. Z. xxxiii. pp. 269–282, revises and redescribes the 5 European species, including a new one. There are undoubtedly two broods in every year. *X. violacea* is considered as doubtfully described by Linnæus, and should be referred to Poda.

Xylocopa violacea, Kriechbaumer, Tagebl. xlv. Vers. Natur. p. 137, describes an hermaphrodite example.

Xylocopa fuscata, Smith, ♂ described, from Samarcand: Radoszkowsky, Hor. Ent. Ross. viii. p. 194.

Fossil wood perforated by ? *Xylocopa*, from Vaugirard, mentioned by Dubouchet, Bull. Soc. Ent. Fr. (5) ii. p. xlvi.

Apathus quadricolor, Kriechb., ? = *Psithyrus sylvestris*, Lep.; *Bombus aurigmalis*, Zett. (*nec* F.), ♂, is an *Apathus*, and is described as new under the name *brissonurus*, p. 49, from Lapland: Thomson, *l. c.*

Bombus pla[illegible]us. Thomson, *l. c.*, lays considerable stress on the use of the anal forceps of the ♂ in determining species, and figures those organs in *B. sylvarum* (fig. 4), *lapidarius* (fig. 5), *soroensis* (fig. 6), *hypnorum* (fig. 7), *hortorum* (fig. 8), *terrestris* (fig. 9), *subterraneus* (fig. 10), *nivalis* (fig. 11), and the portions of them termed *squama* and *lacinia* by the author in *B. tricolor*, *brevigena*, *hypnorum*, *pratorum*, *lapponicus*, and *scrimshiranus*. According to

him, *B. opulentus*, Gerst., ? = *consobrinus*, Dbm.; *B. tunstallanus*, Drews. & Sch., = *harrisellus*, Kby., = *ruderatus*, F.; *B. distinguendus*, Moraw., is to be used for *fragrans*, Kby., Dbm., = *pratorum*, F., *nec* L.; *B. sylvarum*, Moraw., *nec* L., = *autumnalis*, Dbm., *nec* F., = *equestris*, Drews. & Sch., *nec* F., and is renamed *arenicola*; *B. mastrucatus*, Gerst., ? = *brevigena*, Thoms.

Gerstäcker, *l. c.* pp. 282–298, gives particulars as to distribution, sexes, varieties, structure, &c. of *B. terrestris*, *martes*, *hortorum*, *subterraneus*, *pascuorum*, Scop. (= *muscorum*, L., *certe*), *mesomelas*, *mucidus*, *lapponicus*, *montanus*, *mendax*, *proteus* (♀ and workers), *mastrucatus*, and *globosus*. *B. soroensis* should be written *sorœensis*.

Apis mellifica. Giotto Ulivi has published a pamphlet (extracted from the 'Industriale Italiano,' vi. 1872, nos. 5 & 6, and reviewed in Pet. Nouv. no. 61, p. 245), under the title 'Esame critico delle teorie sulla partenogenesi delle Api,' in which the existence of that phenomenon in the bee is negatived.

Gyrodroma, g. n., Thomson, Hym. Scand. ii. p. 259. Allied to *Chelostoma*. Types *Heriades nigricornis*, Nyl. (*truncorum*, L., *nec* Kby.), and *florisomnis*, L.

New species:—

Panurgus siculus, Morawitz, Hor. Ent. Ross. viii. p. 215, Sicily.

Panurginus sculpturatus, id. *l. c.* ix. p. 60, Saratov; *P. samarcandus*, Radoszkowsky, *ibid.* viii. p. 192, pl. vii. figs. 3 & 4, Samarcand.

Osmia melanura, p. 203, Calabria, *clypearis*, Corfu, *curvipes*, Syra, &c., p. 204, *tigrina*, p. 206, Epirus, *dalmatica*, p. 207, Dalmatia, *crenulata*, p. 208, Crete, Corsica, &c., Morawitz, *l. c.* viii.; *O. grandis*, p. 54, Saratov, Amasia, *princeps*, p. 57, Astracan, *id. l. c.* ix.; *O. aterrima*, p. 357, Meran, Dalmatia, Sicily, Persia, *carniolica*, p. 358, Carinthia, *lævifrons*, p. 360, Meran, *montivaga*, p. 361, Swiss Alps, *id.* Verh. z.-b. Wien, xxii.; *O. truncatula*, p. 239, Sweden, *laticeps*, p. 242 (? = *uncinata*, Gerst.), Scandinavia, Thomson, Hym. Scand. ii.

Lithurgus maximus, Radoszkowsky, *l. c.* p. 191, pl. vii. fig. 1, Samarcand.

Megachile lapponica, Thomson, *l. c.* p. 227, Lapland; *M. arundinacea*, Taschenberg, Z. ges. Naturw. xxxix. p. 10, Natal; *M. excellens*, Morawitz, *l. c.* ix. p. 53, Tauria.

Anthidium pubescens, Morawitz, *l. c.* ix. p. 59, and 3 varr., Caucasus; *A. decoratum*, p. 492, 6-*maculatum*, p. 502, Sion (Leman), *albidulum*, p. 495, 6-*lineatum*, p. 499, Begniens: Chevrier, MT. schw. ent. Ges. iii.

Dufourea cæruleocephala, Morawitz, *l. c.* ix. p. 61, Astracan.

Heriades casularum and *angustata*, p. 505, *intermedia* and *paxillorum*, p. 506, Nyon, Chevrier, *l. c.*; *H. appendiculata*, Morawitz, *l. c.* viii. p. 209, Calabria.

Ceratina cærulea (? = *cyanea*, Lep.), p. 490, *chalybea*, p. 491, Nyon, Chevrier, *l. c.*; *C. tarsata*, Morawitz, *l. c.* viii. p. 214, Crete.

Nomada manni, p. 227, Corsica, Tinus, &c., *chrysopyga*, p. 228, Tinus, Calabria, 3-*punctata*, p. 229, Calabria, Syra, Corfu, *calabra*, p. 230, Calabria, Morawitz, *l. c.* viii.; *N. mutica*, p. 380, *rhenana*, and 6 varr., p. 382, *similis* (parasitic on *Panurgus ater*), p. 386, Creuznach, *id.* Verh. z.-b. Wien, xxii.; *N. bifida*, Thomson, *l. c.* p. 196, Sweden (*ruficornis*, Kby., var. *a*).

Ammobates carinatus, Morawitz, Hor. Ent. Ross. viii. p. 202, Calabria; Radoszkowsky, Bull. Mosc. xlv. p. 8, Portugal, Algiers.

Phileremus algeriensis and var. *β*, Radoszkowsky, *l. c.* p. 31, Algeria.

Epeolus fallax, Morawitz, Verh. z.-b. Wien, xxii. p. 387, Italy.

Cœlioxys mandibularis, Chevrier, *l. c.* p. 487, Nyon; *C. farsteri*, Morawitz, Hor. Ent. Ross. viii. p. 211, Dalmatia, Epirus; *C. obtusispina*, Thomson, *l. c.* p. 247, Gothland.

Stelis ruficornis, Morawitz, *l. c.* viii. p. 210, Rhodes.

Tetralonia radoszkovskii, id. *l. c.* ix. p. 50, Saratov; *T. albirufa*, Radoszkowsky, Hor. Ent. Ross. viii. p. 193, Samarcand.

Anthophora denticrus, Morawitz, Verh. z.-b. Wien, xxii. p. 356, Creuznach; *A. rogenhoferi*, id. Hor. Ent. Ross. viii. p. 201, Tinus, Rhodes; *A. nigricornis*, p. 45, *deserticola*, p. 48, Astracan, *gracilipes*, p. 46, Derbent, Caucasus, *id. ibid.* ix.; *A. fedchenkoi*, Radoszkowsky, *ibid.* viii. p. 189, pl. vii. fig. 2, Samarcand.

Xylocopa valga, Gerstäcker, S. E. Z. xxxiii. p. 276, Bozen, Crimea, Syria, Trieste.

Bombus vorticosus, id. *l. c.* p. 290, Cracow, Greece, Roumelia, Dauria.

Vespidæ.

"Inlandsche sociale Wespen," by H. J. van Ankum (Gröningen: 1870), has not been seen by the Recorder.

Synagris calida: economy described, from Natal. Taschenberg, Z. ges. Naturw. xxxix. pp. 1–5.

Belonogaster sp.: described (not named) and habits recorded, from Natal: *id. l. c.* pp. 18–20.

Polistes gallicus. Radoszkowsky, Hor. Ent. Ross. viii. Bull. pp. v & vi, indorsing Sichel's opinion, that *P. diadema*, *geoffroyi*, *pictior*, *biglumis*, and *bucharensis* are merely varieties of this, the only European species, which is also spread over Africa and Asia, also refers *P. chinensis*, F., Sauss., from the Himalayas to it. Differences are attributed to hybridization.

Vespa crabro: specimens from Europe, Siberia, and N. America are certainly specifically identical, whereas *V. orientalis*, from Asia, differs from it in the structure of the genital organs. F. Smith, P. E. Soc. 1872, p. x.

Vespa germanica. Note on nidification by H. J. van Ankum, Arch. Néerl. v. 1870 (sep. Abdr.).

Crabronidæ.

Stizus annulatus, Klug, ♂ described, from Astrabad. Radoszkowsky, Hor. Ent. Ross. viii. p. 198.

Observations on various species of *Ampulex*, *Priononyx*, *Sphex*, *Pseudosphex*, *Chlorion*, *Stethorectus*, *Podium*, *Pelopœus*, *Ammophila*, *Pepsis*, *Prionocnemus* (*Priocnemis*, auctt.), *Agenia*, *Pogonius*, *Pompilus*, *Planiceps*, and *Ceropales*, from the district of La Plata, in connexion with Taschenberg's paper in Z. ges. Naturw. xxxvi.: H. Burmeister, S. E. Z. xxxiii. p. 239 *et seq.*

Ammophila sabulosa: defective neuration in fore wing: C. Ritsema, Tijdschr. Ent. (2) vii. p. xxxv. pl. 12. fig. *a*.

Pelopœus chalybeus and *spirifex*, from Natal: habits &c. noted by Taschenberg, Z. ges. Naturw. xxxix. pp. 11 & 12.

Pompilus (? *fuscus*). F. Karsch, Z. ges. Naturw. xxxix. pp. 441–452, pl. iii.,

describes and figures a species parasitic on *Aranea inquilina*, Clk., and discusses its economy.

Myzine. Instances of sexes being generically separated are recapitulated: *M. cylindrica*, Pz., and *Tiphia glabrata*, F., are added as being sexes of the same species; the characters of the genus are discussed, and it is suggested that *Myzine* should be dropped and *Plesia*, Jur., adopted: Gerstäcker, S. E. Z. xxxiii. p. 250.

Piagetia, g. n., C. Ritsema, Ent. M. M. ix. p. 121. Allied to *Larrada* and *Larraxena*, Sm., but with 1st submarginal cell longer than 2 next together; one ocellus, prothorax neck-shaped, petiolated cordate abdomen, and armed hind femora. *P. wærdeni*, sp. n., *id. ibid.* (and figs. *d* & *e*), Congo; *P. ritsemæ*, sp. n., *id. l. c.* p. 122, figs. *a*, *b*, *c*, E. Java.

Tachytes grandis, sp. n., Chevrier, MT. schw. ent. Ges. iii. p. 508, Nyon.

Pelopœus targionii, sp. n., Caruccio, Bull. Ent. Ital. iv. pp. 273–275, Sardinia.

Sphex haberhaueri, sp. n., Radoszkowsky, Hor. Ent. Ross. viii. p. 199, pl. vii. fig. 5, Astrabad.

Pompilus natalensis, sp. n., Tachenberg, Z. ges. Naturw. xxxix. p. 13, Natal.

Agenia domestica, sp. n., *id. l. c.* p. 16, Natal.

Pepsis chrysoptera, p. 233, Tucuman, Catamarca, *auriguttata*, p. 234, Parana, spp. nn., Burmeister, *l. c.*

Myzine xanthocera, sp. n., Gerstäcker, *l. c.* p. 252, Zanzibar.

Dorylidæ.

Gerstäcker, S. E. Z. xxxiii. pp. 254–269, discusses at great length the affinities of *Dorylus* and *Dichthadia*, chiefly from the analogy afforded by the real or supposed relations of the former with *Typhlopone* and *Anomma*. His observations are of considerable physiological interest, but incapable of satisfactory abstraction.

Dichthadia furcata, sp. n., *id. l. c.* p. 267, S. Africa.

Formicidæ.

Gustav Mayr, SB. Ak. Wien, lxi. (1870) pp. 370–417, pl., under the title "*Formicidæ Novogranadenses*," describes 101 species from New Granada (including 43 new, and 2 new genera), which he considers to be probably one half of the number existing in that district. Of those already known, some have been recorded from Mexico, the Antilles, Panama, Brazil, the Argentine Republic, and elsewhere in South America; others occur from Mexico to Brazil; and *Prenolepis longicornis*, *Odontomachus hæmatodes*, *Tetramorium guineense*, and *Solenopsis geminata* are considered to be cosmopolitan. In addition to portions of various new species, the author figures parts of *Camponotus pellitus*, Mayr, small worker, fig. 1, and *Hypoclinea abrupta*, Smith, fig. 9. The following observations occur:—*Camponotus atriceps*, Sm., and *C. esuriens*, Sm. (*vulpinus*, Mayr), are corroborated as one species, of which *fulvaceus*, Norton, *ex typ.*, is a colour variety, and *tæniatus*, Rog., is the ♀; *C. flexus*, Mayr, = *crassus*, small worker; *Formica abrupta*, Sm., is a *Hypoclinea*, but erroneously referred by Roger to *H. bidens*, L.; *Prenolepis*

pyramica, Rog., is a *Dorymyrmex*, of which genus the workers are only to be distinguished by the metanotum from those of *Hypoclinea*; 9 varieties of *Pseudomyrma gracilis*, F., are briefly described, including *P. bicolor*, Guér., *dimidiata*, Rog., and probably *mexicana*, Rog.

The same author, Ann. Mus. Genov. ii. pp. 133–155, under the title "*Formicidæ Borneenses*," describes species collected by Doria & Beccari in Sarawak, 64 in number. Some synonymy is given, and females or workers of known species apparently described for the first time.

Formica rufa. On its nest, habits, and parasites, *cf.* Buchanan White, Scot. Nat. i. pp. 216–222, 258–263.

Formica fusca: 2 ♂ simultaneously *in copulâ* with one ♀. A. Müller, Ent. M. M. ix. p. 120.

Buchanan White notes the habits of a black *Formica* at Capri, which carried seeds of leguminose and other plants along a road to the nest. P. E. Soc. 1872, p. v.

Aphanogaster: J. T. Moggridge, P. E. Soc. 1872, p. viii, having kept a colony under glass, confirms his previously expressed belief that the insects feed on stored grain.

Camponotus pubescens absorbs fluid from *Tettigometra virescens*, Latr., as from an *Aphis*: Delpino, Bull. Ent. Ital. iv. p. 342 *et seq.* The author discusses various questions suggested by this unexpected association of species, his chief deductions being that *Formica* was created before *Aphis*, *Coccus*, or *Tettigometra*, and that the latter is probably the stem-form of the *Aphidi d*

Tetramorium cæspitum: *Chennium bituberculatum* and *Centrotoma lucifuga* (*Col.*), *Myrmecophila acervorum* (*Orth.*), and one Hemipterous and two Hymenopterous species, recorded by Javet as living in its nests: Bull. Soc. Ent. Fr. (5) ii. p. li.

Mayr describes the following new genera and species:—

Technomyrmex, Ann. Mus. Genov. ii. p. 147. Allied to *Tapinoma*: abdomen, seen from above, with 5 segments, and with the anus apical, cleft and not ciliated. *T. strenua*, ibid., worker and ♀, Sarawak and Singapore.

Belonopelta, SB. Ak. Wien, lxi. p. 394. *Ponerides*. Facies of *Ponera contracta*, but the clypeus has a sharp, straight, porrect spine in the middle. *B. attenuata*, l. c. p. 395, fig. 11, *a*, *b* (worker only), New Granada.

Rhopalothrix, ibid. p. 415. Very near *Strumigenys*, but with 7-jointed antennæ. *R. ciliata*, ibid. (worker), New Granada, *R.* (? g. n.) *bolani*, ibid., note (♀), Surinam.

Camponotus nitens, worker and ♀, p. 378, *fasciatus*, worker, p. 379, *novogranadensis*, worker, *circularis*, fig. 2, worker, p. 380, *angulatus*, worker, *conulus*, fig. 3, worker, p. 382, *sphenoidalis*, worker, p. 383, *excisus*, fig. 4, worker, p. 384, *trapezoidus*, worker, *lindigi*, fig. 5, worker and ♀, p. 385, *canescens*, worker, p. 386, *bidens*, worker, p. 387, *bispinosus*, worker, fig. 6, p. 388, New Granada, *ibid.*; *C. inconspicuus*, p. 135, Sarawak and Java, *contractus* and *doriæ*, p. 137, Sarawak, all workers: Ann. Mus. Genov. ii.

Prenolepis nodifera, SB. Ak. Wien, lxi. p. 388, worker, New Granada.

Brachymyrmex tristis, ibid. p. 389, worker, New Granada.

Polyrhachis beccarii, *nigripilosa*, p. 141, *prainosa*, p. 142, workers, Sarawak (the 2nd also from Celebes): Ann. Mus. Genov. ii.

Hypoclinea laminata, worker, fig. 8, p. 389, *lamellosa*, ♀, p. 390, *iniqua*

worker, fig. 10, p. 392, *pilifera*, worker and ♀, p. 393, New Granada: SB. Ak. Wien, lxi.

Pachycondyla maxta, worker, p. 395, *ænescens*, worker, p. 396, New Granada: *ibid.*

Ectatomma confine, ibid. p. 397, worker, New Granada.

Monomorium latinode, Ann. Mus. Genov. ii. p. 152, worker, Sarawak.

Phidole biconstricta, ♂ and worker, p. 399, New Granada, *punctatissima*, ♂ and worker, p. 400, St. Fé de Bogota, Mexico, *læviventris*, worker, *incisa*, ♂ and worker, p. 401, New Granada: SB. Ak. Wien, lxi.

Cremastogaster distans, p. 402, *sulcata*, *brevispinosa*, p. 403, *torosa*, p. 404, *nigripilosa*, p. 405, all workers, New Granada: *ibid.* *C. coriaria*, Ann. Mus. Genov. ii. p. 154, worker, Sarawak.

Solenopsis rugiceps and *læviceps*, both workers, SB. Ak. Wien, lxi. p. 406, New Granada.

Pseudomyrma excisa, *excavata*, p. 410, *sericea*, p. 412, *elongata*, p. 413, workers, *pallens*, worker and ♀, p. 411, New Granada: *ibid.*

Cataulacus coriarius, *carbonarius*, *rudis*, ibid. p. 414, workers, New Granada.

Ichneumonidæ.

Snellen van Vollenhoven, Schetzen &c. i., gives outlines (with some details of external anatomy) of the following genera:—*Ichneumon*, *Pœcilostictus*, *Ischnus*, *Stilpnus*, *Brachypterus*, *Microleptes*, *Mesoleptus*, *Lampronota*, *Tryphon*, *Exochus*, *Cybocephalus*, *Scolobates*, *Sphinctus*, *Trogus*, [*H*]*Alomy*[*i*]*a*, *Hoplismenus*, *Cryptus*, *Phygadeuon*, *Mesostenus*, *Hemiteles*, *Pezomachus*, *Phytodietus*, *Ischnocerus*, *Nematopodius*, pl. i.; *Mesochorus*, *Plectiscus*, *Glypta*, *Lissonota*, *Polysphincta*, *Schizopyga*, *Pimpla*, *Ephialtes*, *Rhyssa*, *Trachyderma*, *Metopius*, *Bassus*, *Orthocentrus*, *Eucerus*, *Banchus*, *Exetastes*, *Coleocentrus*, *Arotes*, *Campoplex*, *Paniscus*, *Anomalon*, *Ophion*, *Trachynotus*, *Pachymerus*, pl. ii.; *Cremastus*, *Porizon*, *Atractodes*, *Hellwigia*, *Acocnites*, *Xylonomus*, *Xorides*, *Amblyteles*, *Listrodromus*, *Eurylabus*, *Platylabus*, *Herpestomus*, *Colpognathus*, *Dicælotus*, *Centeterus*, *Phæogenes*, *Agrothereutes*, *Aptesis*, *Theronia*, *Polyblastus*, *Exyston*, *Pristomerus*, pl. iii.

Ichneumonides.

Amblyteles camelinus, Wsm., = *cardui*, Schrank; *A. fuscipennis* bred from *Mamestra pisi*: Kriechbaumer, MT. schw. ent. Ges. iii. p. 477.

Ichneumon alpicola, p. 482, *capito*, p. 484, *id. l. c.*, Swiss Alps; *I. opulentus*, p. 307, *kastneri*, p. 309, Taschenberg, Z. ges. Naturw. xxxviii., Innsbruck: spp. nn.

Cryptides.

Tschek, Ver. z.-b. Wien, xxii. pp. 232 & 233, describes both sexes and 4 varieties of *Cryptus recreator*, F., from Austria, remarking that *Meringopus*, Först., is founded only on a sexual character, the extreme outer side of the base of the tarsal claws being minutely toothed in the females of *C. calescens*, *obscurus*, *australis*, *cyanator*, and *tarsoleucus*, as well as in this species. He describes (p. 237) individuals from his own collection apparently not corro-

borating Taschenberg's reference of *C. inconspicuus*, Grav., to the ♂ of *spiralis*, Grav.; (p. 238) both sexes of his *C. incisus*; ♂ & ♀ varr. of his *C. extinctor* [in error, *exstinctor*], p. 239; the males of his *C. bucculentus* and *mactator*, p. 241, *C. femoralis*, Gr., p. 242, *C. confector* and 6-*annulatus*, Gr., p. 246, *C. vindex* (and ♀ var. of *C. alutaceus*), Tsch., p. 247, and *C. ornatus*, Gr., p. 248. At p. 250 he supplements the diagnostic characters of *C. incubitor*, Ratz., and his own *C. cimbicis*.

Cryptus extrematis, Cresson, ♂, = *nuncius*, Say, and the true ♂ described; habits and earlier stages recorded: C. V. Riley, iv. Rep. Ins. Mo. pp. 110 & 111, figs. 40 & 41. *C. samiæ*, Pack., ? = *extrematis*, var.: *id. ibid.*

Pupæ referred to *Cryptus* are recorded as springing *more Mordellarum*: Mink, Tijdschr. Ent. (2) vii. p. 285.

Cryptus pygoleucus, Gr., probably ♂ of *Agrothereutes hopii*, Gr.: T. A. Marshall, Ent. M. M. ix. p. 120.

Linoceras, Tasch. (1865), preferred to *Macrobatus*, Holmgr. (1854), as the latter clashes with the species *macrobatus*, Grav.; *Brachycentrus*, Tasch., renamed *Cyrtocryptus* for a similar reason, and because that name is preoccupied in *Neuroptera*. *Id.* Tr. E. Soc. 1872, p. 259 (Cat. Brit. Hym. iii. p. 41).

Pezomachus trux, Först., ♀, = *hortensis*, Gr., var. 5, ♀, = *Hemiteles palpator*, Gr., ♂, and var. 4, ♂ (excll. ♀ and other varr.), = *H. palpator*, Tasch., ♂. The insect is to be referred to *Hemimachus*, and *trux*, Först., should be retained as its specific name; *hortensis*, Grav., including more than one species. *P. fasciatus*, F., Gr., ♀, = *Hemiteles luteiventris*, Gr., ♂, = *Hemimachus fasciatus*, Ratz., ♂ ♀ (reared from eggs of *Agelena brunnea*). *Id.* Ent. M. M. viii. p. 180.

Cryptus murorum, Austria and Tyrol, and *lutescens*, ? Austria, p. 234, *divisorius*, p. 235, Lower Austria, *pseudonymus*, p. 238, Dalmatia, *genalis*, p. 240, ? Austria, *mediterraneus*, p. 242, Calabria, Corfu, &c., *ionicus*, p. 244, Corfu, *buccatus*, p. 245, Lower Austria, *polytomi*, p. 248 (bred from cocoon of *Lophyrus polytomus*), *bipunctatus*, Lower Austria, and *collaris*, Piesting, p. 249: Tschek, *l. c.*, spp. nn.

Listrognathus tricolor, sp. n., *id. l. c.* p. 251, ? Austria.

Pezomachus pettiti, p. 61, Ontario, *canadensis*, p. 62, *tantillus*, *meabilis*, p. 62, *compactus*, p. 63, *alternatus*, p. 64, Illinois, *gentilis*, p. 61, *gracilis*, p. 63, *macer* (? = ♂ of *P. gracilis* or *dimidiatus*), p. 64, Pennsylvania, *obscurus*, p. 62, New Jersey, *dimidiatus*, p. 63, *unicolor*, p. 64, Massachusetts, *texanus*, p. 64, Texas: Cresson, Canad. Ent. iv., spp. nn.

Ophionides.

Ophion macrurum, L. (parasitic on *Attacus cecropia*), and larva figured: C. V. Riley, iv. Rep. Ins. Mo. pp. 107 & 108, figs. 37 & 38.

Trachynotus, Grav., *nec* Latr. (*Tenebrionidæ*) is changed to *Nototrachys*; *Collyria* [*Collyris*, Fab., *Coleoptera*, 1801], Schiödte, is employed for *Pachymerus*, Grav. (1829), *nec* Lep. & Serv. (*Hemiptera*, 1825) [Thunberg, *Coleoptera*, 1805]: T. A. Marshall, Tr. E. Soc. 1872, p. 260 (Cat. Brit. Hym. iii. pp. 50 & 63).

Campoplex carbonarius, Ratz., and *Meteorus* (*Perilitus*) *bimaculatus*, Wesm.,

parasitic on *Fidonia ericæ*. Snellen v. Vollenhoven, Sepp's Ned. Ins. (2) ii. p. 207.

Limneria fugitiva, Say, bred from *Phycita nebulo, Dryocampa senatoria, D. stigma, Euchætes egle, Clisiocampa sylvatica*, and *Saturnia maia* : C. V. Riley, *l. c.* p. 41.

Atractodes guienzii, sp. n., Taschenberg, Z. ges. Naturw. xxxix. p. 7, Natal.

Mesochorus atriventris, p. 21, Illinois, *luteipes*, New Jersey, *basalis*, Massachusetts, p. 22, *americanus*, Pennsylvania, Delaware, Illinois, *totonacus*, Orizaba, p. 23, *scitulus, obliquus, melleus*, p. 24, Pennsylvania : Cresson, Canad. Ent. iv., spp. nn.

Pimplides.

Thalessa clavata, F. Ghiliani, Bull. Ent. Ital. iv. p. 352 *et seq.*, refers to capture of ♂ of this species near Turin, but considers there is no evidence of the ♀ having been found in Italy.

Pimpla arundinator, F., ♂ described, parasitic on *Lipara* ; *P. gallicola*, M., *stercorator*, Gr., varr., ♂, described from oak-galls and willow-galls of *Nematus gallarum* ; *P. graminellæ*, Schr., ♂ described (*Ephialtes inanis*, Gr., ♂, pt.), parasitic on *Anthomyia spreta*, Meig. : Giraud, Ann. Soc. Ent. Fr. (5) ii. p. 506. *P. conquisitor, indagatrix*, and *annulipes* bred from *Acrobasis juglandis* : C. V. Riley, iv. Rep. Ins. Mo. p. 43, note.

Sphætes crassicrus, Bremi, ex. *typ.*, = *Echthrus reluctator*, L., ♀, var. : Kriechbaumer, S. E. Z. xxxiii. p. 10.

Atractogaster, g. n., Kriechbaumer, *l. c.* p. 6. Resembles *Ephialtes* ; last joint of tarsi nearly equal in length to the two preceding ; head subbuccate ; 2nd abdominal segment obliquely impressed on each side. *A. semisculptus*, sp. n., *id. l. c.* p. 7, Chur.

Braconidæ.

Snellen van Vollenhoven, Schetsen &c. ii., gives outlines (with some details of external anatomy) of the following genera :—*Euphorus, Rhopalophorus, Perilitus, Streblocera, Microctonus, Blacus, Centistes, Pygostolus, Sigalphus, Calyptus, Eubadizon, Elasmosoma, Acœlius, Microgaster, Meteorus, Microtypus, Diospilus, Aspigonus, Helcon, Laccophrys, Macrocentrus, Phylax, Orgilus*, pl. iv. ; *Earinus, Microdus, Agathis, Proterops, Ichneutes, Cholonus, Ascogaster, Rhyti[do]gaster, Acampsis, Opius, Bracon, Cœloides, Histeromerus, Exothecus, Pelecystoma, Rhogas, Clinocentrus, Oncophanes, Hormius, Doryctes, Dendrosoter, Spathius, Corystes, Hecabolus*, pl. v. ; *Ecphylus, Pambolus, Chremylus, Alysia, Trachyusa, Syncrasis, Aphæreta, Chasmodon, Synaldis, Polemon, Copisura (Chænon), Cœlinius, Œnone, Chœnusa, Chorebus, Dacnusa, Praon, Trioxys, Aphidius, Ephedrus, Neoneurus, Dyscolus, Mirax, Cenocœlius, Cardiochiles*, pl. vi.

Hybrizon, Fall., preferred to *Pachylomma*, Bréb. : T. A. Marshall, Tr. E. Soc. 1872, p. 260.

Microgaster : about 1000 individuals bred from one larva of a large Ceylonese species of the *Bombycidæ* : J. O. Westwood, P. E. Soc. 1872, p. xxiii.

M. alvearius : peculiar circumstances attending its occurrence under larvæ of a *Geometer* on *Thuia aurea*. T. Bell, Ent. vi. p. 187, fig.

Wesmaelia cremasta, sp. n., Marshall, Ent. M. M. viii. p. 257, Spanish Pyrenees and North Devon.

Aphidius gregarius, sp. n., *id. l. c.* ix. p. 123, parasitic on *Aphides* of poplar and willow, near London. Habits by R. M'Lachlan, P. E. Soc. 1872, p. ii.

Perilitus niveitarsis, p. 81, *intermedius*, p. 82, Massachusetts, *pallitarsis*, p. 80, *dimidiatus*, p. 83, New Jersey, *communis*, p. 82, Connecticut, *proximus*, *vulgaris*, p. 83, *humilis*, p. 84, Illinois, Cresson, Canad. Ent. iv.; *P. indagator*, Riley, iv. Rep. Ins. Mo. p. 43 (bred from *Acrobasis juglandis*) : spp. nn.

Microctonus agilis, sp. n., Cresson, *l. c.* p. 226, Illinois.

Euphorus sculptus, *mellipes*, *scitulus*, spp. nn., Illinois, *id. l. c.* p. 227.

Liophron lævc, sp. n., *id. l. c.* p. 228, Canada.

Calyptus major, Canada, Virginia, Illinois, *rotundiceps*, Illinois, ibid., *mexicanus*, Orizaba, *tibiator*, New Jersey, p. 229 : *id. l. c.*, spp. nn.

Eubadizon laterale, p. 229, Illinois, *pleurale*, Missouri, *americanum*, New Jersey, p. 230 : *id. l. c.*, spp. nn.

Ichneutes bicolor, p. 230, Massachusetts, *fulvipes*, p. 231, Illinois : *id. l. c.* spp. nn.

Chalcididæ.

Snellen van Vollenhoven, Schetsen &c. iii. ("Pteromalinen") gives outline figures of the following genera, often with details of external anatomy :—*Leucaspis*, *Dirrhinus*, *Smicra*, *Comurus*, *Chalcis*, *Halticella*, *Agonioneurus*, *Mesidia*, *Coccophagus*, *Stenocera*, *Eusandalum*, *Eupelmus*, *Chiloneurus*, *Comys*, *Bothryothorax*, *Discodes*, *Euryscapus*, *Cerapterocerus*, *Choria*, *Cercobelus*, *Copidosoma*, *Cerchysius*, *Ericydnus*, *Dinocarsis*, *Rhopus*, pl. vii. ; *Leptomastix*, *Habrolepis*, *Sceptrophorus*, *Ectroma*, *Encyrtus*, *Calypso*, *Macroglenes*, *Pirene*, *Spalangia*, *Cerocephala*, *Eucharis*, *Perilampus*, *Chrysolampus*, *Elatus*, *Ormyrus*, *Palmon*, *Cryptopristus*, *Monodontomerus*, *Diomorus*, *Oligosthenus*, *Megastigmus*, *Syntomaspis*, *Lochites*, *Callimome*, *Decatoma*, *Eurytoma*, pl. viii. ; *Systole*, *Isosoma*, *Cea*, *Tetracampe*, *Trigonoderus*, *Prosopon*, *Platynochilus*, *Notanisus*, *Macroneura*, *Cleonymus*, *Merostenus*, *Cratomus*, *Dipara*, *Pachycrepis*, *Pachyneurum*, *Cyrtogaster*, *Pachylarthrus*, *Syntomopus*, *Dichalysis*, *Panstenon*, *Cryptoprymna*, *Micromelus*, *Lamprotatus*, *Sphegigaster*, *Toxeuma*, pl. ix. ; *Isocratus*, *Merisus*, *Dicyclus*, *Urolepis*, *Micradelus*, *Psilonotus*, *Isoplata*, *Rhaphidotelus*, *Gastrancistrus*, *Tridymus*, *Megapelte*, *Systasis*, *Stictonotus*, *Meraporus*, *Rhoptrocerus*, *Peridesmia*, *Simopterus*, *Chiropachys*, *Rhopalicus*, *Etroxys*, *Pteromalus*, *Epicopterus*, *Elasmus*, *Euplectrus*, *Elachistus*, *Aulogymnus*, pl. x.

F. Walker (London : 1872) completes his 'Notes on Chalcidiæ' (see Zool. Rec. viii. p. 344 *et seq.*), under the following heads :—Part v. Encyrtidæ (continuation), Myinidæ, Eupelmidæ, Cleonymidæ, Spalangidæ, and Pirenidæ, pp. 71–88 ; Part vi. Hormoceridæ, Sphegigasteridæ, Pteromalidæ, Elasmidæ, Elachistidæ, Eulophidæ, Entedonidæ, Tetrastichidæ, and Trichogrammidæ, pp. 89–105 ; Part vii. notice of species found in Madeira, pp. 106–129. These notes are, practically, abstracts or reproductions of Förster's prior work, with descriptions at random of new species and reproductions of figures (from Haliday's drawings, originally published in the 'Entomologist' of 1842) of *Ormyrus punctiger*, *Aphelinus basalis*, *Coccophagus scutellaris*, *Ericydnus strigosus*, *Cerchysius urocerus*, *Cercobelus jugæus*, *Encyrtus corniger*, *Cerapterocerus mirabilis*, *Ectroma fulvescens*, *Trigonoderus obscurus*, *Lelapsadales*, *Notanisus versicolor*, *Cea pulicaris*, *Calosoter vernalis*, *Eupelmus urozonus*, *E. degeeri*, *Cerocephala formiciformis*, *Pirene varicornis*, *Gastrancistrus*

laticornis, *Hormocerus maritimus*, *Psilonotus adamas*, *Rhaphi*[*do*]*telus maculatus*, *Semiotus varians*, *Systasis encyrtoides*, *Syntomopus thoracicus*, *Sphegigaster flavicornis*, *Merisus splendidus*, *Merostenus phedyma*, *Dipara petiolata*, *Coryna clavata*, *Toxeuma ericæ*, *Psilocera obscura*, *Prosodes ater*, *Metopon atrum*, *Eutelus immaculatus*, *Pteromalus latus*, *Ætroxys scenicus*, *Eunotus cretaceus*, *Hemiptarsenus fulvicollis*, *Prosopon montanum*, *Micromelus pyrrhogaster*, *Entedon amyclas*, *Euplectrus albiventris*, *Eulophus aphaca*, *Cirrospilus pulchellus*, *C. attalus*, *C. pacuvius*, *Tetrastichus caudatus*, *Pteroptrix menes*, *Trichogramma evanescens*, and *Thysanus ater*.

Bothryothorax may be reunited to *Encyrtus*; *Calosoter bifasciatus* may be renamed *Eupelmus fasciipennis*; *Pteromalus abnormis*, Boh., perhaps belongs to the *Agaonides*. The author (Ent. vi. pp. 17, 41, 67, 89, 113, 131, 201, 225, 249) simultaneously again reproduces the first 18 of the above-named figures, with others, derived from the same source, of *Isosoma flavicolle*, *Eurytoma platyptera*, *Podagrion splendidum*, *Torymus caliginosus*, *Schizaspidia furcata*, *Eucharis iello*, *Stilbula volusus*, and *Notaspis formiciformis*, accompanied by unconnected observations of the nature above mentioned. In the same publication, pp. 52 & 78, he refers to species found in the Scilly Isles; and in Canad. Ent. iv. pp. 186, 209, 236, makes some vague observations on the distribution &c. of Canadian genera.

Chalcis mariæ, Riley, figured; parasitic on *Attacus cecropia* and *prometheus*: C. V. Riley, iv. Rep. Ins. Mo. p. 109, fig. 30.

Larva of a *Chalcis* recorded as feeding upon imago of *Cynips*: T. A. Chapman, Ent. M. M. ix. p. 13.

2 unknown species of *Eurytoma* and *Callimome* reared from gall of *Cynips lignicola*: F. Walker, Ent. vi. p. 101. Other parasites (including *Ormyrus punctiger*) noted by E. A. Fitch, *ibid.* p. 243.

Coccophagus: habits referred to by J. O. Westwood, P. E. Soc. 1872, p. xviii.

Pteromalus multicolor and *abieticola*, Ratz., *Roptrocerus xylophagarum*, Ratz., and ? *Cœloides scolyticida*, Wesm., referred to as parasitic upon *Tomicus typographus* in Styria, and the name *bostrichorum* suggested for the *Cœloides* (which is described), if not identical with Wesmael's species. Giraud, Bull. Soc. Ent. Fr. (5) ii. pp. ix–xi.

New genera and species :—

Tineomyza [vox hybr.], Rondani, Bull. Ent. Ital. iv. p. 205. *Myinides*. *T. pistacina*, id. *ibid.*, parasitic on a *Tinea* (*terebintella*, Rond. MS.), from galls of *Pistacia terebinthus*, Palermo.

Cleptimorpha [*Clepto-*], Walker, Notes &c. p. 84. In the *Cleonymides*, but resembles the *Chalcidides* in structure of hind legs. *C. binotata*, id. *l. c.* p. 85, Madeira.

Sparthiopilus [? *Spartiophilus*, vox hybr.; *Spartophila*, Chevr., *Col.*], Rondani, *l. c.* p. 208. *Entedonides*. *S. bruchicida*, id. *ibid.*, parasitic on *Bruchus spartii*, Italy.

Encyrtus centhorhynchi, Rondani, *l. c.* p. 207, parasitic on *Centhorhynchi assimilis*, Italy; *E. areolatus*, p. 79, Corsica, *colligatus*, *congruus*, p. 115, Madeira, Walker, Notes &c.

Metallon atriceps, Walker, *l. c.* p. 115, Madeira.

Eupelmus subnubilus, p. 81, *pezomachoides*, p. 82, Corsica, *subvittatus*, S. France, *leithi*, Bombay, p. 83, *tenuicollis*, p. 86, Mysol: *id. l. c.*

Prionopelma longifica, id. *l. c.* p. 84, Amazons.
Trigonoderus contractus, id. *l. c.* p. 85, England.
Epistenia nigra, Zulu, 4-*plagiata*, Amazons, *id. l. c.* p. 87.
Hormocerus impletus, id. *l. c.* p. 96, Corsica.
Ectroma maderensis, id. *l. c.* p. 116, Madeira.
Gastrancistrus pallicornis, id. *ibid.*, Madeira.
Dicyclus pallinervosus, id. *l. c.* p. 117, Madeira.
Sphegigaster degener, id. *ibid.*, Madeira.
Stictonotus degener and *insuetus*, id. *ibid.*, Madeira.
Metastenus purus, id. *l. c.* p. 118, Madeira.
Pteromalus insularis, p. 100, *semiluteus*, p. 101, Corsica, *pandens*, p. 101, Torla, Spain, *tinctipennis*, p. 118, *integer*, p. 119, *contaminatus*, *alternipes*, p. 120, *nigricans*, *dulcis*, *consuetus*, p. 121, *obscurellus*, *obumbratus*, p. 122, *stigmatizans*, *basicyaneus*, p. 123, Madeira, *id. l. c.*; *P.* (? g. n.) *oomyzus*, p. 202, *ovivorus*, p. 203, Rondani, *l. c.*, Italy, parasitic on eggs of *Eurydema ornatum* (*Hemipt.*).
Euplectrus intactus, Walker, *l. c.* p. 102, Corsica.
Elachistus æqualis and *contractus*, id. *l. c.* p. 124, Madeira.
Cirrospilus bifasciatus, id. *l. c.* p. 103, Bordeaux.
Eulophus sobrius, p. 124, *divisus*, *entedonoides*, *centralis*, p. 125, *maculipennis*, p. 126, *id. l. c.*, Madeira, the last ? also Gt. Britain.
Diglyphus clavicornis, id. *l. c.* p. 126, Madeira.
Epiclerus femoralis, id. *ibid.*, Madeira.
Entedon intaminatus, id. *ibid.*, Madeira.
Tetrastichus maderæ, *socius*, p. 128, *subpictus*, *perpusillus*, p. 129, Madeira: *id. l. c.*

Proctotrypidæ.

Ceraphron (*Lygocerus*) *carpenteri*, Curt., attacks larvæ of *Aphidius* in *Aphides*: T. A. Marshall, Ent. M. M. ix. p. 124.

Cynipidæ.

Mayr (Verh. z.-b. Wien, xxii. pp. 669–726) supplements his work on the oak-galls of Central Europe by tabulating and describing the inquiline species of the genera *Synergus*, *Sapholytus*, and *Ceroptres*. He reviews the general literature &c. of the subject, specially noting that in *Ceroptres* two forms of parthenogenesis occur, in which either females alone or both sexes are produced; and, generally, that two well-marked species of inquilines can live in one gall. The results (as regards production of species) of an examination of 100 isolated galls of *Cynips lignicola* are given at p. 675, note. The author notes the varied times of appearance of the different species, and tabulates them by the galls from which they are produced. *Cynips quercus-pedunculi*, L., Réaumur, = *Spathogaster baccarum*, L.; *Synergus rugulosus*, Htg., = *haynianus*, Htg.; *S. immarginatus*, Htg., = *apicalis*, Htg.; *S. australis* and *pallicornis*, Htg., = *flavicornis*, Htg., but *pallicornis* is retained; *S. erythrocerus*, Htg., *ex. typ.*, = *albipes*, Htg.; *S. tibialis* and *nigricornis*, Htg., = *nervosus*, Htg.; *S. bispinus*, Htg., and ? *palliceps*, Htg., = *facialis*, Htg.; *S. luteus* and ? *carinatus*, Htg., = *thauma*[*to*]*cera*, Dalm.; *Sapholytus erythroneurus*, Htg., *ex. typ.*, = *connatus*, Htg.

The species described, with synonymy, full account of habits, and of galls frequented, &c., are:—*Synergus melanopus*, p. 695, *flavipes* and *haynianus*,

p. 700, *ruficornis*, p. 701, *apicalis*, p. 705, *incrassatus*, p. 707, *pallicornis*, p. 709, *albipes*, p. 712, *varus* and *nervosus*, p. 713, *vulgaris*, p. 715, *facialis*, p. 717, and *physoceras*, p. 721 (all Htg.), and *S. thauma[to]cera*, Dalm., p. 719; *Sapholytus connatus*, Htg., p. 722, *Ceroptres arator*, Htg., p. 724, and several new species.

Microscopic slides of portions of *Cynipidæ* referred to, and a fresh specific character noted in the structure of the compressed lobes at the apex of the ventral segment of the abdomen. J. O. Westwood, P. E. Soc. 1872, p. xviii.

Cynips lignicola: parasites recorded, F. Walker, Ent. vi. p. 101; E. A. Fitch, *ibid.* p. 243. It extends to East Lothian, J. Hardy, Scot. Nat. i. p. 181; also to Glasgow and near Hamilton, P. Cameron, Jun., *ibid.* p. 266.

Spathogaster baccarum: gall on *upper* side of leaf. P. Cameron, Jun., *l. c.* p. 266.

"Chinese Artichoke Gall" (Hance, J. L. S. Bot. xiii.): A. Müller, J. L. S. xi. pp. 428–431, compares an excrescence found on oaks in China, and presumably resulting from the operations of a *Cynips*, with the gall of the European *Aphilothrix gemmæ*, L.

Mayr, *l. c.*, describes the following new species:—

Synergus reinhardi, p. 698, Austria, from galls of *Cynips argentea* and of 6 other species; *S. evanescens*, various parts of Germany, from galls of *Aphilothrix gemmæ* &c., and *S. pallidipennis*, Hungary and Austria, galls of *Cynips conifica* &c., p. 699; *S. variabilis*, p. 702, Austria, galls of *Cynips cerricola* &c.; *S. rotundiventris*, p. 706, Austria, galls of *Diophanta macroptera*; *S. tscheki* (?=*pallipes*, Htg.), p. 708, Germany and Austria, galls of *D. scutellaris* &c.; *S. tristis*, p. 715, Austria, galls of *Andricus urniformis* and *Neuroterus ostreus*; *S. radiatus*, p. 718, Austria and Germany, galls of *Aphilothrix albipunctata* &c.

Sapholytus haimi, galls of *Andricus nitidus* &c., and *S. undulatus*, galls of *Cynips cerricola*, Austria, p. 723.

Ceroptres cerri, p. 725, Austria, galls of *Cynips cerricola* &c.

Urocerida.

Thomson, Hym. Scand. i. pp. 323–333, discusses the Swedish species, under the "tribes" *Siricina*, *Xiphydr[i]ina*, and *Oryssina*. He describes as a new species, under the name *melanocerus*, p. 328, the *Sirex juvencus* of Htg., *nec* L.

Tenthredinidæ.

Thomson, Hym. Scand. i. pp. 13–323, discusses the Swedish species, under the "tribes" *Cimbicina*, *Hylotomina*, *Tenthredinina*, *Blasticotomina*, *Lydina*, *Xyelina*, and *Cephina*, giving (pp. 334 & 335) an outline plate with copious explanation of various portions of external anatomy. He adopts the name *pentandræ* from De Geer for the *Cynips (Nematus) amerinæ* of Linnæus, supposed to clash with the *Cimbex* of the latter name; renames *exarmata* his own *Blennocampa monticola* (*nec* Htg.); and gives copious synonymy, partly original.

A. J. van Rossum, Arch. Néerl. vii. pp. 381–384, describes the results of experiments upon the fluid ejected by *Cimbex connata* and *sylvarum*. He comes to the conclusion that it is a concentrated solution of a variable

substance greatly resembling albumen. The colouring-matter is probably only chlorophyl from the leaves of the plants on which the larvæ feed.

Nematus vallisnierii, Htg.: galls on willows by water only on the sides of the tree overhanging the land. P. Cameron, Jun., P. E. Soc. 1872, p. vi.

Nematus pallicercus, Htg., *Dineura opaca*, F., and *Athalia phthisica*, Ritz.: observations on varieties &c. by C. Ritsema, Tijdschr. Ent. (2) vii. p. 110.

Dineura rufa, *Macrophya albicincta*, *Phyllotoma melanopyga*, *Nematus aquilegiæ* and *betularius*: van Vollenhoven's descriptions &c. translated by J. F. May, Ent. vi. pp. 18, 43, 70, 94, 132, *et seqq.*

Allantus (Htg.). Rudow, S. E. Z. xxxiii. pp. 83–94, 137–142, revises the European species, restricted to 13, including 3 treated as new. *A. propinquus*, Klg.,= *scrophulariæ*, L.; *marginellus*, F.,= *viennensis*, Schr.; 6-*annulatus*, Schr.,=*tricinctus*, F., var.; a var. n. of *nothus*, Klg., is described under the name *melanotus*, p. 139; *succinctus* and *luteiventris*, St. F., *zonulus*, Klg., *bicinctus*, Schf.,=*zona*, Klg., varr.; other synonymy is given.

Emphytus fulvicinctus, sp. n., Rudow, *l. c.* p. 217, ? Harz district.

Dineura unicolor, sp. n., *id. l. c.* p. 218, ? Harz district.

Allantus heraclei, p. 90, *multicinctus*, p. 91, *semifasciatus*, p. 140, *id. l. c.*, ? Harz district; *A. himalayensis*, p. 195, Himalaya, *felderi*, p. 196, Ning-Po: Radoszkowsky, Hor. Ent. Ross. viii.: spp. nn.

Thomson, *l. c.*, describes the following new species, from various parts of Scandinavia:—

Cimbex violascens, p. 20 (*lutea*, var. B, Fall., Hart., Dahlb.; *lutea*, Deg., *nec* L., var. *humboldti*, Ratz.), *brevispina*, p. 21 (*lutea*, var. A, Fall., *variabilis*, Ratz., ? *femorata*, L.).

Abia bifida (*ænea*, ♀, Dahlb.), *mutica* (*nitens*, Fall., *nec* L.), p. 28.

Schizocera cylindricornis, p. 44, *geniculata*, p. 45, *fusicornis* (? *intermedia*, Zadd.), p. 46.

Lophyrus eremita, p. 62.

Monoctenus subconstrictus, p. 67.

Cladius dreweni, p. 73.

Leptocercus nigriceps, p. 78.

Nematus dochmocerus, p. 93, *alpinus*, p. 98, *lativentris*, p. 99, *erythrogaster*, p. 103, *subbifidus*, *bistriatus*, p. 105, *retusus*, p. 109, *punctifrons*, p. 111, *fumipennis*, p. 112, *olivaceus*, p. 120 (? *pallicarpus*, Htg.), *wahlbergi*, p. 125, *hyperboreus*, p. 127, *scabrivalvis*, p. 132, *dahlbomi*, p. 134 (*viduatus*, Dahlb., *nec* Zett.), *acuminatus*, p. 138, *inflatus*, p. 139, *umbratus*, p. 142, *bohemani*, p. 143, *jugicola*, p. 146, *monticola*, p. 147, *brevivalvis*, p. 151, *microcercus*, *curtispina*, p. 152, *lacteus*, p. 155, *puella*, p. 160, *crassipes*, p. 162, *crassispina*, p. 164.

Fenusa intermedia, p. 186.

Emphytus klugi, p. 194 (*apicalis*, Kl., ♀, *filiformis*, Kl., ♂).

Hoplocampa pectoralis, p. 202.

Blennocampa recta, p. 210, *emarginata*, p. 217, *mentiens*, p. 221.

Pœcilosoma guttatum, p. 231, *longicorne*, *submuticum*, p. 232, *excisum*, p. 233.

Taxonus albipes, p. 235 (*cerasi*, ♂, Zett.).

Selandria interstitialis, p. 237, *temporalis*, *analis*, p. 239.

Strongylogaster geniculata, p. 243.

Pachyprotasis lævicollis, p. 249 (? =*simulans*, Kl.).

Perineura alpina, p. 267.
Tenthredo arctica, p. 273.
Dolerus annulipes, p. 280, *arcticus*, p. 284, *æriceps*, p. 285, *puncticollis*, *liogaster*, p. 286, *brevicornis*, p. 288, *elongatus*, p. 293.
Lyda scutellaris, p. 303, *albipicta*, p. 312.
Xyela piliserra, p. 317.
Cephus brachycercus, p. 322, *pilosulus*, p. 323.

LEPIDOPTERA

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

General Notes.

H. Strecker has published "Lepidoptera, Rhopaloceres, and Heteroceres [*sic*], indigenous and exotic, with descriptions and coloured illustrations." No. I. Reading, Pa.: 1872, 4to, pp. 8, pl. 1.

A. Guénée ("Notice sur divers Lépidoptères du Musée de Genève," Mém. Soc. Phys. Genève, xxi. pp. 369–424, 1 plate; also separate, pp. 56) describes several species of *Papilio* as new, monographs the *Catagrammides*, and describes and figures an hermaphrodite *Bombyx quercus*.

On the colour and edibility of larvæ, *cf.* H. Doubleday & P. Meldola, Ent. M. M. ix. pp. 45, 68, 69.

On variation in the colour of Lepidopterous larvæ and pupæ, *cf.* Fallou & Mabille, Bull. Soc. Ent. Fr. (5) ii. pp. lv & lvi.

On destructive swarms of larvæ in Belgium, *cf.* E. Birchall, Ent. vi. pp. 13, 81, 82.

On larvæ found living on the surface of snow, *cf.* Du Plessis, Bull. Soc. Vaud. (2) xi. p. 176.

On destroying caterpillars, *cf.* Pet. Nouv. 1872, pp. 195 & 196.

On the development of *Lepidoptera* after leaving the pupa, *cf.* A. Kuwert, S. E. Z. 1872, pp. 412–414.

Hagen remarks on the various *Lepidoptera* which have retained a larval head in the perfect state. This monstrosity has been noticed in *Noctua heteroclita*, *Bombyx mori* (twice), *Nymphalis populi*, *Vanessa antiopa*, *Zygæna exulans*, var. *vanadis*, *Vanessa atalanta*, *Gastropacha quercifolia*, *Botys fuscalis*, *Sphinx* sp., *Zerene adustata*, and *Morpho eurylochus*. S. E. Z. 1872, pp. 388–402.

The ribs of the battledore scales of *Polyommatus alexis* and other *Lycænidæ* are furnished with rows of "beads," consisting of a base, a column, and a rounded head, and these vary in size in different species: J. Anthony, M. Micr. J. vii. pp. 1–3, 250–252, pls. 1 & 2. The beaded appearance on the scales of many other butterflies and moths is also confirmed by H. de Cerbecq and H. J. Slack, *op. cit.* pp. 24–26, 48 & 49.

C. R. Bree argues against the views of Darwin and his followers as regards sexual selection, mimicry, &c. in *Lepidoptera*. 'Exposition of Fallacies in the Hypothesis of Mr. Darwin,' pp. 207–214.

On mimicry in British *Lepidoptera*: R. C. R. Jordan, Ent. M. M. viii. pp. 251–253, and P. Meldola, Ent. v. p. 163.

On the copulation of distinct species, *cf.* W. V. Andrews, Canad. Ent. iv. pp. 78 & 79.

On sterility in *Lepidoptera*: Westwood & Briggs, P. E. Soc. 1872, p. 27.

On hybrids, *cf.* Breyer, Ann. E. Belg. xv. pp. 45 & 46.

On plants fertilized by *Lepidoptera*: W. C. Marshall, Nature, vi. p. 393.

On neuration in *Lepidoptera*: Clemens & Stainton, Tin. N. Amer. pp. 13–16.

On varr. of British *Lepidoptera*: Meldola, Stevens, & Bond, P. E. Soc. 1872, pp. 28, 31, 43, 44.

On relaxing *Lepidoptera* with laurel leaves, *cf.* Ragonot and others, Ann. Soc. Ent. Fr. (5) ii. pp. 212–214; Bull. pp. lxiv, xc, xci, xcii, xciv.

The European and N.-American faunas are more nearly related than the European and Siberian, and should be regarded as one: P. C. Zeller, in the introductory remarks to his 'Beiträge zur Kenntniss der nordamerikanischen Nachtfalter, besonders der Microlepidopteren,' 1. Abth. (Verh. z.-b. Wien, xxii. pp. 447–556, pls. 2 & 3).

On the distribution of various *Lepidoptera*: M. Wagner, SB. Bayer. Ak. 1870, ii. pp. 167–171. Distinct but closely allied species either feed on different plants, or are confined to different localities.

Notes on a few European *Lepidoptera*: W. Henäcker, S. E. Z. 1872, pp. 320–322.

Great Britain:—

On the relations of the British Lepidopterous fauna to that of the Continent, *cf.* E. Birchall, Zool. (s. s.) vii. pp. 3304–3306.

H. G. Knaggs, in "Notes on new and rare British Lepidoptera (excepting Tineina) in 1872," Ent. Ann. 1873, pp. 34–47, records 8 species new to Britain, and 18 larvæ not before described.

On *Lepidoptera* observed in the North of England in 1871, *cf.* Maling & Bold, Tr. North. Durh. iv. pp. 380–385.

List of *Lepidoptera* of N. Staffordshire, by T. W. Daltry, Rep. N. Staff. Club, 1872 (*cf.* Ent. vi. p. 133).

F. B. White has commenced a list of the *Lepidoptera* of Scotland, giving range, habitats, &c., and also indicating the British and European ranges. The portion now published includes the *Rhopalocera* and *Hepialidæ*. Scot. Nat. i. pp. 161–168, 198–202, 238–241, 273–276, map.

R. C. R. Jordan (Ent. Ann. 1873, pp. 70–82), in a critical notice of F. Buchanan White's 'Fauna Perthensis' (*cf.* Zool. Rec. viii. p. 353), adds remarks on many of the most interesting species.

Notes on Irish *Lepidoptera*: A. W. Foot, P. Dubl. Soc. vi. pp. 5–15.

Lists of captures are published by J. J. Walker, at Sheerness and Sheppy (Ent. M. M. viii. pp. 184 & 185, ix. pp. 162 & 163); by W. D. Robinson, at Braemar (*op. cit.* pp. 186 & 187); by E. N. Bloomfield, at Guestling (*op. cit.* p. 188); by J. H. A. Jenner, at Battle and Lewes (*op. cit.* pp. 211, 250); by R. P. Murray, in the Isle of Man (*op. cit.* p. 250); by C. G. Barrett, at Norwich &c. (*op. cit.* p. 271, ix. pp. 18–21, 89–91); by G. T. Porritt, in Lancashire and Cheshire (*op. cit.* ix. p. 21, Ent. vi. pp. 7 & 8); by J. W. H. Traill,

in Aberdeenshire (Ent. M. M. ix. pp. 42–44, Scot. Nat. i. pp. 212 & 213); by J. B. Hodgkinson, in the Isle of Man and at Witherslack (Ent. M. M. ix. pp. 44, 66, 67, 141); by G. C. B. Madden, H. Birchall, & G. Parry, at Sherwood Forest (*op. cit.* pp. 139–141, Ent. vi. pp. 211–213); by W. H. Cole, in Norfolk and Suffolk (Ent. vi. p. 52); by E. Lawless, in Ireland, with notes on species new to Ireland, &c. (*op. cit.* pp. 74–78, 97–100); by G. H. Raynor, at Tonbridge (*op. cit.* pp. 79 & 80); by F. J. Battersby, in Westmeath (*op. cit.* pp. 101 & 102); by T. P. Lucas, at Leominster and Watlington (*op. cit.* pp. 114–119, 134–137); by A. B. Farn, in the New Forest (*op. cit.* pp. 120–122); by W. Thomas, in Surrey (*op. cit.* pp. 173 & 174); by G. B. Corbin, at Loughton (*op. cit.* pp. 187 & 188); by G. T. Porritt and T. W. Daltry, on the Lancashire and Cheshire sand-hills (Zool. s. s. vii. pp. 3075 & 3076).

France. Captures by H. Millière, in the Vallée de Lantosque (Alpes Maritimes): Pet. Nouv. 1872, pp. 265 & 266.

Holland.

Sepp, Jan Christian. Nederlandsche Insecten. Beschrijvingen en afbeeldingen van Nederlandsche Vlinders, bijeengebragt door S. C. Snellen van Vollenhoven. (2) ii. 's Gravenhage: 1870, 4to, pp. 236, pls. 50.

Of this work a portion, as published in numbers, has already been noticed in Zool. Rec. (Nos. 35–38, containing pp. 152–178, and pls. 35–39, issued in 1869: *cf.* Zool. Rec. vi.). It is now issued as a complete volume; and the species hitherto unnoticed will be discussed *in situ*.

Snellen, P. C. T. De Vlinders van Nederland. Macrolepidoptera, systematisch beschreven. 's Gravenhage: 1867, large 8vo, pp. xi & 763, pls. 4.

A work which would undoubtedly obtain (as it deserves) a more extended circulation, if it were not entirely (including even the diagnoses) written in Dutch. The author has apparently laid much greater stress than is usual on *structural* characters. The plates consist of various portions of the external anatomy of many genera throughout the *Lepidoptera*. One new species and 3 professedly new genera are described; and probable Dutch species are mentioned in the notes.

The author (pp. 13–20) arranges the Dutch *Lepidoptera* as follows:—

Rhopalocera: Papilionidæ, Hesperiidæ.

Heterocera: (*Macrolepidoptera*) Sphingidæ, Sesiidæ, Cossidæ, Hepialidæ, Cochliopodæ, Psychidæ, Zygænidæ, Syntomidæ, Chelonariæ, Liparidæ, Bombycidæ, Endromidæ, Saturniidæ, Drepanulidæ, Notodontidæ, Cymatophoridæ, Noctuina, Brephidæ, Geometridæ.

Heterocera: (*Microlepidoptera*) Pyralidæ, Tortricidæ, Micropterygidæ, Tineina, Pterophoridæ, Alucitina.

10 *Macrolepidoptera* new to the fauna of Breda recorded by F. J. M. Heylaerts, fils: Tijdschr. Ent. (2) vii. pp. 118–120.

Belgium. Captures by C. Donckier & L. Quaedvlieg: Ann. E. Belg. xv. pp. 110–115, with notes on altitude &c.

Italy and S. France. Captures by F. Walker: Ent. vi. pp. 227–230.

Italy. *Lepidoptera Rhopalocera* of Padua: Tacchetti, Atti Soc. Ven. Trent. i.; Bull. Soc. Ent. Fr. (5) ii. p. cxiii; and Atti Soc. Pad. i. pp. 97–126 (105 species).

Sicily. Captures by von Kalchberg: S. E. Z. 1872, pp. 312–320, 403–414.

Thecla w-album, *Lycæna icarus*, var. *icarinus*, and *Lasiocampa otus* are noticed as new to Sicily: G. P. Marott, Bull. Ent. Ital. iv. pp. 105 & 106.

Switzerland. Captures in the Grisons by P. C. T. Zeller: S. E. Z. 1872, pp. 27–63, 99–120. On Mt. Pilat by Peyerimhoff: Pet. Nouv. 1872, p. 231.

M. Täschler has published (Ber. St. Gall. Ges. 1869–1870, pp. 51–146) a list of the *Lepidoptera* of the Cantons of Appenzell and St. Gall. The list extends to the end of the *Geometræ*. 580 species are recorded, as against 1433 for Germany and Switzerland, and 2179 for Europe. Interesting general remarks are prefixed on the nature of the district, the distribution of *Lepidoptera*, and the causes which influence it, the height at which they have been observed in the Swiss Alps, variation, hybrids, parthenogenesis, &c.

Norway. List of 119 species captured at Osterdalen by H. Siebke: N. Mag. Naturw. xix. pp. 68–73.

Russia. Captures at Anton and Schilling by A. Becker: Bull. Mosc. 1872 (3), p. 116.

Von Nolcken's 'Catalogue of the *Lepidoptera* of Esthonia &c.' is reviewed by Weinmann: Ann. E. Belg. xv. pp. 78–91.

Asia. Captures in Persia by H. Christoph: S. E. Z. 1872, pp. 204–207.

C. Oberthur publishes a list of the *Lepidoptera* collected by T. Deyrolle in Asia Minor: R. Z. xxiii. pp. 480–488.

G. v. Emich makes some additions to the Lepidopterous fauna of Transcaucasia, and describes a few new species: Hor. Ent. Ross. ix. pp. 40–44.

Notes on Chinese Butterflies: A. David, N. Arch. Mus. vii. p. 96.

Africa. Captures by T. Blackmore in N.W. Morocco, with remarks on the *Microlepidoptera* by Stainton: Ent. M. M. viii. pp. 228–236.

On the *Lepidoptera* of Lower Guinea: P. C. T. Snellen, Tijdschr. Ent. (2) vii. pp. 1–110. 95 species noticed, many new.

H. D. J. Wallengren publishes notes (in Latin) on the Lepidopterous fauna of S. Africa, describing many new moths, and redescribing several butterflies previously briefly characterized by himself. Remarks (in Swedish) on Trimen's Rhop. Afr. Austr. and Kirby's Cat. D. Lep. are prefixed to the paper. Œfv. Vet. Ak. 1872, pp. 41–61.

In Auguste Vinson's 'Voyage à Madagascar au couronnement de Radama II.' (Paris: 1865, royal 8vo: not hitherto mentioned in Z. R.), Annexe F, is a list of *Lepidoptera*, pp. 25–48 (180 species), with introduction, notes, and description of new genera and species by Guénée. The list is full of new and uncharacterized family names.

Australia. Captures in S. Australia by H. R. Cox: Ent. vi. pp. 203–209.

New Zealand. R. W. Fereday, in a criticism on A. Bathgate's paper (*cf.* Zool. Rec. viii. p. 355), reviews the Lepidopterous fauna of New Zealand. The *Noctuæ*, *Geometræ*, *Pyralides*, *Crambidæ*, and *Pterophori* are well repre-

sented; the butterflies, *Bombyces*, and *Tineæ* badly: Tr. N. Z. Inst. iv. pp. 214–218.

America. H. D. J. Wallengren enumerates 35 *Lepidoptera* as occurring in the small Caribbean island of St. Bartholomew. Three new species are described in Latin; the remainder of the paper is in Swedish. Œfv. Vet. Ak. 1871, pp. 909–919.

Captures in New-York State by J. A. Lintner, Rep. N.-York Cab. xxiii. pp. 180–197.

'A Classified Catalogue of the *Lepidoptera* of Canada,' Toronto, 1872, 8vo, pp. 9, has been published by A. M. Ross, containing the name of one new species.

On Butterflies and Sphinges collected at Fox Bay, Anticosti, and the north shore of the St. Lawrence: W. Couper, Canad. Ent. iv. pp. 201–206.

On the *Lepidoptera* of Nova Scotia: J. M. Jones, Tr. N. Scot. Inst. iii. pp. 18–27, 100–103.

A few *Lepidoptera* from Camel's Hump, Orleans Co., are mentioned by P. S. Sprague, Arch. Sci. Orl. Co. i. pp. 87 & 88.

List of Butterflies collected by Campbell Carrington and W. B. Logan in 1871 at Montana, Yellowstone, Colorado, Nevada, &c., *cf.* W. H. Edwards, Hayden's Rep. of U. S. Geol. Survey of Montana &c. pp. 406 & 407.

A list of 113 butterflies occurring in the State of New York: J. A. Lintner, Rep. N. Y. S. Cab. xxiii. pp. 176–179.

Captures of butterflies in Massachusetts and Iowa: H. W. Parker, Am. Nat. vi. pp. 115 & 116.

E. Newman, Zool. (s. s.) vii. pp. 2877–2898, reviewing Kirby's 'Catalogue of Diurnal Lepidoptera,' gives a sketch of the systems of Ray, Haworth, Leach, Latreille, Herrich-Schäffer, Newman, and Kirby [which latter differs little from that previously proposed by Bates].

G. R. Crotch reviews the generic nomenclature of *Lepidoptera* from 1735 to 1816, and attempts to fix the types of the genera with precision: Cist. Ent. pp. 59–71, 91 & 92.

On the changes of nomenclature in Staudinger & Wocke's Catalogue: Staudinger, De Borre, & Guénée, Pet. Nouv. 1872, pp. 180 & 181, 184 & 185.

An obituary notice of R. Felder's life and works: J. R. Schiner, Verh. z.-b. Wien, xxii. pp. 41–50.

Rhopalocera.

Parts 81–84 of Hewitson's 'Exotic Butterflies,' and parts 11–14 of Butler's 'Lepidoptera Exotica,' have appeared within the year.

W. F. Kirby (On the Geographical Distribution of the Butterflies as compared with that of the Birds, P. L. S. Zool. xi. pp. 431–439) adopts Sclater's regions of distribution, and indicates the representative genera of each. 7500 birds are mentioned by Sclater, and 7700 butterflies by Kirby. The number of birds slightly predominates in all districts except the Neotropical, where there are 4200 butterflies to 2250 birds. The Palæarctic and Nearctic faunæ can scarcely be considered primary divisions. Within the Palæarctic region are the Arctic, Central (including the Alpine), and Mediterranean faunas, and probably a "Steppe-fauna" in Central Asia. Africa possesses a number of peculiar forms; but most of the characteristic Palæarctic and Indian forms are

absent, and the fauna is generally very uniform in character. The N.-Indian species have a great affinity with those of Singapore; those of S. India and Ceylon are imperfectly known; but these districts are probably much poorer than N. India, with a larger proportion of African or Australian forms. The Australian region is poor in butterflies, though rich in peculiar forms of *Lepidoptera Heterocera*. The Nearctic region is remarkably poor in peculiar forms, possessing hardly any which are not equally well represented in the Palæarctic region, and by no means all the Palæarctic forms. California and Chili properly belong to the Palæarctic region, and not to the Nearctic or Neotropical. The Neotropical region is remarkable for its enormous number both of species and characteristic forms. The line between the Nearctic and Neotropical regions appears to intersect the West Indies. The Mexican fauna is chiefly Neotropical.

S. H. Scudder has published a "Systematic Revision of some of the American Butterflies, with brief notes on those known to occur in Essex County, Mass." (Rep. Peab. Acad. iv. pp. 24–83; also separate, pp. 62). Many new genera and species (the latter all *Hesperiidæ*) are characterized, and short notes on the earlier stages of many species added. All old tribal names are restored throughout, independently of their terminations. Many known genera are recharacterized, and the types of all indicated, but perhaps in some instances incorrectly (reviewed Amer. Nat. vi. pp. 354–359).

On nomenclature, with special reference to Scudder's revision, *cf.* Canad. Ent. iv. pp. 212–216, 218.

Scudder copies Abbott's MS. notes on such Georgian butterflies as are also to be met with in the Northern States: Canad. Ent. iv. pp. 73–77, 84–87.

Edwards's 'Butterflies of North America,' vol. i., has been completed by the issue of pt. 10 and a supplementary number. The appended "Synopsis of N.-American Butterflies" having been completed by the publication of pp. 39–52 (including the *Hesperiidæ* and supplement) has since been issued separately. It includes 500 species, against 137 known before 1852, as occurring in the United States and British America.

On the Diurnal Lepidoptera described by Jablonsky & Herbst: W. F. Kirby, Tr. E. Soc. 1872, pp. 111–120. Herbst's classification is also noticed, *l. c.*

On variation in butterflies: C. Oberthur, Pet. Nouv. 1872, p. 220.

On migration of butterflies, their settling on the sea, &c.: Holdsworth & Pocklington, Ent. vi. pp. 150–152 (extracted from the 'Field').

On the earliest and latest dates of appearance of some of the rarer British butterflies: J. C. Dale, Ent. vi. pp. 159–161.

Papilionides.

A list of the *Papilionidæ* in the Museum of the Royal Dublin Society is published by W. F. Kirby, J. R. Dubl. Soc. vi. pp. 63–66.

On *Papilio pandarus, phorbanta, pelaus, miltiades, pompilius* (=*policenes*, Cr.), *atticus* (=*empedocles*, F., *nec* Cr.), and *apollinus*, of Jablonsky & Herbst, *cf.* W. F. Kirby, Tr. E. Soc. 1872, pp. 111, 112, 117.

On aberrant variations in specimens of *Papilio cloanthus, Parnassius apollo, delius*, and *clodius*, and *Thais polyxena*, *cf.* R. P. Murray, P. E. Soc. 1872, pp. 33 & 34.

On sexual variation in *Papilio*, *cf.* C. Oberthur, Pet. Nouv. 1872, p. 220.

Papilio machaon: formation of tracheæ, scales, &c., in the pupa, at different stages. H. H. Higgins, Nature, v. p. 204.

S. H. Scudder (Rep. Peab. Ac. iv. pp. 64–66) recharacterizes and restricts the genera *Laertias*, Hübn., *Pterurus*, Scop., *Euphaides* and *Iphiclides*, Hübn., and *Amaryssus*, Dalm., and indicates *Papilio philenor*, *troilus*, *glaucus*, *podalirius*, and *machaon* as their respective types.

Guénée (Mém. Soc. Phys. Genèv. xxi. pp. 370–379) describes *Papilio xenodamas*, Hübn., var. ?, notices *P. neptunus*, Guér., and redescribes *P. photinus*, Doubl. He also remarks on the structure of *P. corethrus* and *duponcheli*, describes both sexes, and figures the females (plate, figs. 3 & 4).

Prof. Westwood describes several new species and varieties (Tr. E. Soc. 1872, pp. 85–110), and remarks on *Papilio crino*, *P. palinurus*, Fab. (=*brama*, Guér.,=*regulus*, Stoll), *P. dædalus*, Feld. (=*palinurus*, Guér.), *P. nox*, ♂ (pl. 4. fig. 2, outline), and *P. zenobia*, Fab., Don. *P. thersander*, Don., is a fictitious species.

Papilio demoleus has been artificially introduced into Mauritius: Vinson, P. R. Soc. Maur. (2) vi. p. 30. Larva described by Vinson & Guénée, Voy. Mad. Annexe F, p. 33.

P. idalion, Feld.,=*P. cymochles*, Doubl., ♀: W. F. Kirby, J. R. Dubl. Soc. vi. p. 65.

P. brutus. Pupa described by Guénée, *l. c.* (1865).

P. podalirius. *P. zanclæus*, Zell., is a second brood: De Sélys Longchamps, Ann. Ent. Belg. xv. p. 94.

P. polymnestor, var.: Kirby, *l. c.* p. 64.

P. calverleyi, Grote. W. H. Edwards now considers it distinct from *P. asterias*: Syn. N. Amer. Butt. p. 51.

Armandia, Blanch., is intermediate between *Thais* and *Papilio*, and replaces *Sericinus* in Mou-pin: A. David, N. Arch. Mus. vii. p. 96.

Thais deyrollii, Oberthur, redescribed and figured by him: R. Z. xxiii. p. 481, pl. 21. f. 1 & 2.

On the affinity of *Thais* with *Parnassius* and *Zegris*, and on the pouch in the ♀s of *Parnassius* and *Eurycus*, *cf.* R. P. Murray, P. E. Soc. 1872, p. 34.

Parnassius and *Doritis*. Newman places these as a family, *Doritidæ*, between the *Peridæ* and *Hesperiidæ* (Zool. s. s. vii. p. 2890), but elsewhere (pp. 2880 & 2893) shows an inclination to regard them as moths.

Parnassius apollo. On its pupation, *cf.* M. Täschler, Ber. St. Gall. Ges. 1869–1870, p. 87. Supposed to have been taken at Epping [an impossible locality], *cf.* G. B. Holmes, Ent. vi. p. 39.

P. eversmanni, Ménétr. A specimen from Alaska described and figured by W. H. Edwards, Butt. N. Amer. *Parn.* pl. 4. figs. 6 & 7.

P. glacialis, Butler, figured and described: Lep. Ex. p. 88, pl. 34. fig. 1.

P. mnemosyne, var., from Asia Minor, described by C. Oberthur, R. Z. xxiii. p. 481.

P. smintheus, Doubl. W. H. Edwards figures different varieties of this species, with which he unites *P. sayi* and *P. behri*. He also remarks on its habits and variation, on the pouch in the ♀ of *Parnassius*, &c. The egg and

pouch of *P. behri* are also figured. Butt. N. Amer. *Parn.* pls. 2, 3, & 4. figs. 1–5.

Eurycus cressida. On the pouch of the ♀, *cf.* H. Lucas, Bull. Soc. Ent. Fr. (5) ii. pp. lxxxix & xc.

New species :—

Papilio buddha, pl. 3. f. 1, hab. —?, *noctula*, pl. 4. f. 3, *strix*, Borneo (? = *noctula*, ♀), *papone*, pl. 3. f. 2, E. Indies, *ramaceus*, pl. 5. f. 3, Borneo, *odenatus*, pl. 3. f. 3 & 4, W. Africa, *parsedon* (= *sarpedon*, local form), pl. 5. f. 1 & 2, hab. — ?, *burchellanus*, pl. 3. f. 5, Brazil, *chinsiades*, pl. 5. f. 4 & 5, Ecuador, *P. (Euryades) reevii*, Buenos Ayres (? = *duponcheli*, ♀) : Westwood, Tr. E. Soc. 1872, pp. 86–103 ; *P. horribilis*, Butler, Lep. Ex. p. 88, pl. 34. f. 2, Fantee, Cape Coast ; *P. orabilis, lætitia, vulneratus*, and *clusoculis, id.* Cist. Ent. pp. 84 & 85, Costa Rica ; (*Pyrrhosticta*, g. n., with serrated costa to fore wings, proposed by Butler, *l. c.* p. 86, for *P. lætitia* and allies ;) *P. kirbii*, Hewitson, Ent. M. M. ix. p. 146, Lagos ; *P. chlorodamas*, p. 369, f. 1, Peru [= *madyes*, Doubl.], *hypodamas*, p. 371, Hayti [= *polycrates*, Hopff., and probably = *eurydamas*, Roger], *damocrates*, p. 371, f. 2, Buenos Ayres [= *perrhebus*, Boisd.], *thetys*, p. 378, f. 5 [probably = *neptunus*, Guér.], *hermolaus*, p. 379 [= *pausanias*, Hew.] : Guénée, Mém. Soc. Phys. Genèv. xxi. (*cf.* Hewitson, Kirby, and Guénée, Pet. Nouv. 1872, pp. 213, 239, 244).

Thais puziloi, Erschoff, Hor. Ent. Ross. viii. p. 315, Ussuri.

Pierides.

Mesapia and *Calinaga* appear to belong to the *Pieridæ* : G. Weymer, S. E. Z. 1872, p. 182. [Moore considers *Calinaga* to be allied to *Diadema.*]

S. H. Scudder (Rep. Peab. Ac. iv. pp. 58–63) recharacterizes and restricts the genera *Catopsilia* and *Zerene*, Hübn., *Colias*, Fab., *Eurema* and *Abœis*, Hübn., *Ascia*, Scop., *Gancris*, Dalm., and *Synchloe* and *Euchloe*, Hübn., assigning to them as their types *crocale, cæsonia, palæno, delia, nicippe, monuste, rapæ, callidice*, and *genutia*. [He has overlooked the fact that *cardamines* has already been selected as the type of *Euchloe* by English entomologists.]

On *Papilio myrti* (= *Archonius bellona* ♀), *mima* (= *Catopsilia pyranthe*, var.), *lina* (*Dismorphia*, sp.), *aryia, aurora, meta* (= *Callosune aurora*, var. ?), *eucharis, autonoe* (= *Delias carneus*), *hyparethe* (sic), *mærula* (= *Papilio ecclipsis*, Lin., sp. fict.), *lalage* (= *Catopsilia crocale* ♂), *hecabe, hanna* (prior to *Callosune cebrene*, Boisd.), *œnippe, ulrica* (= *Ixias œnippe*, Cr., pt.), *sesia, hyale, palæno, europome*, and *heos* (= *Papilio aurora*, Esp., *nec* Stoll) of Herbst, *cf.* W. F. Kirby, Tr. E. Soc. 1872, pp. 112–114.

Euterpe. Hewitson (Ex. Butt. v. *Eut.* pl. 2) redescribes and figures his *E. teutamis* ♀ (= *epimene*, Hew. *olim*), figs. 7 & 8, *eurigania*, figs. 9 & 10, *etemene*, figs. 11 & 12, and *anaitis*, figs. 13–15.

Leptalis othoe, Hew., = *L. core*, Feld. ; *L. zuthoe*, Hew., = *L. lelex*, Hew., ♀ ; *L. terena* ♂, Hew. (f. 50), = *L. praxidice*, Hew., ♀ ; for *L. terena* ♀ (figs. 51 & 52) the name *L. abilene*, Hew., is proposed. Hewitson, Ex. Butt. iv., corrections.

Dismorphia cordillera, Feld. Butler describes the ♀, Cist. Ent. p. 81.

Hesperocharis fulvinota, Butler, redescribed and figured, Lep. Ex. p. 89, pl. 34. fig. 4.

Terias caffra, Feld. On this species and its allies, *cf.* Wallengren, Œfv. Vet. Ak. 1872, p. 46.

T. zoe, Hopff., and *pulchella*, Trim., = *T. rachel* ♀: Snellen, Tijdschr. Ent. (2) vii. p. 27.

T. reticulata, Butler, redescribed and figured, Lep. Ex. p. 90, pl. 34. fig. 7.

Butler (P. Z. S. 1872, pp. 26–67) publishes a revised list of the species formerly included in the genus *Pieris*. He now recognizes 15 genera (already characterized in Cist. Ent., *cf.* Zool. Rec. vii. pp. 363 & 379) and 341 species. He proposes the names *Delias stolli* (p. 32) for *Papilo autonoe*, Stoll, *nec* Cr., from China; *Appias poeyi* (p. 49) for *Pieris ilaire*, Poey, *nec* Godt., from St. Domingo, Panama, and Honduras; and *Belenois confusa* (p. 55) for *Pieris phileris*, Boisd., ♀, *nec* ♂, from Madagascar.

Neophasia menapia. Edwards describes the ♀: Butt. N. Amer. suppl.; Tr. Am. Ent. Soc. iv. p. 63.

Pontia brassicæ. Great swarms, in company with a few other insects, noticed at sea off Bremen on the 17th of July, 1868: Abh. Ver. Brem. iii. pp. 297 & 298.

Pieris napi, var. *bryoniæ*: Zeller, S. E. Z. 1872, pp. 34–37.

P. oleracea, Harr. On its transformations &c., *cf.* J. A. Lintner, Rep. N. Y. S. Cab. xxiii. pp. 160 & 161.

P. rapæ. Pupa with larval head: Poujade, Bull. Soc. Ent. Fr. (5) ii. p. lxxxiii.

Ganoris rapæ. S. H. Scudder describes var. *novangliæ*, from New England: Canad. Ent. iv. p. 79. On the occurrence of this species and variety (supposed to be the same as one mentioned in Curtis's 'Farm Insects') in America, *cf.* G. J. Bowles, Canad. Ent. iv. pp. 102–105.

Perrhybris, Hübn., cannot be separated from *Pieris*: Wallengren, Œfv. Vet. Ak. 1872, p. 43.

Pinacopteryx. Wallengren points out the characters of this genus. His *P. syrinx* probably = *P. gidica*, var. Œfv. Vet. Ak. 1872, pp. 43 & 44.

Synchloe mesentina. A specimen with aberrant neuration mentioned by R. P. Murray, P. E. Soc. 1872, pp. 33 & 34.

Belenois. Butler (Lep. Ex.) redescribes and figures his *B. ianthe* (p. 91, pl. 34. fig. 8) and *B. meldolæ* (p. 117, pl. 43. fig. 5).

Appias vacans, Butler, redescribed and figured, *l. c.* p. 90, pl. 34. figs. 5 & 6.

Callidryas. Butler (*l. c.*) redescribes and figures *C. philea, thalestris, solstitia*, and *avellaneda* (pp. 92–95, pls. 35, 36), *C. editha, fornax*, and *hersilia* (pp. 105, 106, pl. 39); *C. rorata, argante*, and *minuscula*, pp. 118–120, pl. 44.

C. drya, Fab., probably = *C. eubule*, var., Wallengren, *l. c.* 1871, p. 910.

C. fiaduna, Hew., = *C. thaurama*, Reak. Hewitson, Ex. Butt. iv. corrections.

Colias hyale, auctt. *nec* Linn., is renamed *kirbii*. W. A. Lewis, Discussion, p. 34.

C. pallens, Butler, redescribed and figured by the author, *l. c.* p. 89, pl. 34. fig. 3.

C. scudderi, Reak., and *C. meadi*, Edw., redescribed and figured by W. H. Edwards, Butt. N. Amer. *Col.* p. 8.

Teracolus interruptus and *T. jobina*, Butler, redescribed and figured, Lep. Ex. pp. 115, 116, pl. 43. figs. 1–3.

Callosune deidamia and *pholoe*, Wallengren, redescribed, *l. c.* 1872, pp. 44, 45.

C. agoye belongs to this genus and not to *Teracolus*, Wgr., *l. c.* p. 46.

New species:—

Euterpe dismorphites, Butler, Cist. Ent. p. 80, Costa Rica.

Dismorphia sororna, *hagaresa*, *lubina*, and *viridifascia*, Butler, *l. c.* pp. 82 & 83; *D. lumina*, Butl. & Druce, *op. cit.* p. 111, all from Costa Rica.

Terias persistens and *calceolaria*, Butler & Druce, *l. c.* p. 111, Costa Rica; *T. rama*, Moore, P. Z. S. 1872, p. 566, Colombo, Ceylon.

Leptophobia tenuicornis, Butler & Druce, *l. c.* p. 110; Butler, Lep. Ex. p. 116, pl. 43. fig. 4, Costa Rica.

Pieris notistriga, Butler & Druce, *l. c.* p. 111; *P. noctipennis*, B. & D., *l. c.*, Butler, Lep. Ex. p. 118, pl. 43. fig. 7, Costa Rica; *P. vipasa*, Derajat, Punjaub, N.W. India; *P. taprobana*, Ceylon, Moore, *l. c.* p. 565.

Metaporia caphusa, N.W. Himalayas; *M. ariaca*, Himalayas (Nynee-Tal district), Moore, *l. c.* p. 564.

Mylothris alethina, Butler, Cist. Ent. p. 81, Costa Rica.

Catasticta actinotis, id. *l. c.* p. 80; Lep. Ex. p. 117, pl. 43. fig. 6, Costa Rica.

Thyca devaca, Burmah, *T. derinda*, Khasia Hills, Moore, *l. c.* p. 566.

Eronia pingasa, id. *l. c.* p. 565, Canara, S. India.

Callidryas intermedia, Butler, Cist. Ent. p. 81, Costa Rica.

Colias astræa, Edwards, Tr. Am. Ent. Soc. iv. p. 61, Yellowstone Lake.

Teracolus loandicus, Butler, Lep. Ex. p. 91, pl. 34. figs. 9 & 10, Loanda, Angola.

Anthocharis julia, Edwards, *l. c.* p. 61, Colorado.

Danaides.

Danais archippus. Wallengren describes a local form from St. Bartholomew. Œfv. Vet. Ak. 1871, p. 911. On the duration of life of the imago, *cf.* L. Mitchell, Am. Nat. vi. pp. 237 & 238.

D. chrysippus from Lower Guinea: P. C. T. Snellen, Tijdschr. Ent. (2) vii. p. 12.

D. plexippus and allies: G. Weymer, S. E. Z. 1872, p. 179.

Amauris inferna, Butler, redescribed and figured, Lep. Ex. p. 86, pl. 33, f. 2.

Euplœa sylvester, Fab. Prof. Westwood remarks on Donovan's figure. Tr. E. Soc. 1872, p. 108.

Papilio superbus and *claudius*, Herbst: W. F. Kirby, Tr. E. Soc. 1872, p. 114.

Heliconiides.

Papilio carolina, *hecale*, *karschina* (prior to *Melinæa gazoria*, Godt.), and *unzerina*, of Herbst. W. F. Kirby, Tr. E. Soc. 1872, p. 112.

Athesis acrisione and *dercyllidas*, Hewitson, redescribed and figured, Ex. Butt. v. *Ath.* f. 1–3.

Mechanitis mantineus, Hewitson, redescribed and figured, *l. c. Mech.* f. 16.

Ithomia. Hewitson (*l. c. Ith.* pls. 20, 21) redescribes and figures *I. ozia*, *eidonia* (neuration), *ilerdina*, var., *pronuba*, *antea*, *harbona*, *lycora*, *cænina*, *praxilla*, and *tabera*, figs. 194, 197 *a*, 199, 201–205, 207, 208.

Leucothyris, Boisd., recharacterized and the species enumerated by Butler & Druce, Cist. Ent. p. 97.

Heliconius. If Crotch be right in regarding *Papilio psidii*, Linn., as the type, the genus *Heliconius*, auctt., must take the name of *Migonitis*, Hübn. W. F. Kirby, Tr. E. Soc. 1872, p. 112.

Heliconia euryas, melpomene, vesta, thelxiope, and *cybele*. On their variation, *cf.* C. Oberthur, Pet. Nouv. 1872, p. 220.

Pteronymia, g. n., Butler & Druce, Cist. Ent. i. p. 96. Type *Ithomia aletta*, Hew.

New species :—

Olyras translucens, Hewitson, Ent. M. M. ix. p. 83, Ecuador.

Dircenna lonera and *relata*, Butler & Druce, *l. c.* p. 95, Costa Rica.

Ithomia plaginota, Butler & Druce, *l. c.*, Costa Rica; *I. kusa*, Ecuador, *I. seba*, hab. — ?; *I. egla, kena, lota*, and *theuda* (=*adelinda*, var. ?), Hewitson, Ex. Butt. v. *Ith.*, pls. 20, 21. figs. 195–197, 197 *b*, 198, 200, 206; and *I. linda* (=*adelinda*, var. ?), Hew., *l. c.* text, all from Ecuador.

Pteronymia olyrilla, notilla, and *fulvimargo*, Butler & Druce, *l. c.* pp. 96 & 97, Costa Rica.

Leucothyris rubescens, Butler & Druce, *l. c.* p. 97, Costa Rica.

Heliconia fritschi, Möschler, S. E. Z. 1872, p. 330, Peru ? or N. Granada ?; *H. charina*, Hewitson, Ent. M. M. ix. p. 83, Ecuador; *H. chestertoni*, id. Ex. Butt. v. *Hel.* fig. 22, Columbia.

Euides vulgiformis[!], Butler & Druce, *l. c.* p. 102, Costa Rica.

Acræides.

Papilio ludovica, Herbst, = *Acræa egina*, Cram., W. F. Kirby, Tr. E. Soc. 1872, p. 112.

Acræa hova, Boisd., ♀ and structure of pouch described by Guénée. Vinson, Voy. à Mad. Annexe F, p. 35 (1865).

A. manjaca, Boisd., is distinct from *A. eponina*, Cr.: Snellen, Tijdschr. Ent. (2) vii. p. 11.

A. stenobea, Wallengren, redescribed, Œfv. Vet. Ak. 1872, p. 49.

A. zitja, Boisd. *A. rakeli*, Boisd., is the ♀, and *A. rahira*, Boisd., a var.: Guénée, *l. c.*

Acræa piva, Guénée, *l. c.* p. 34 (1865) (?=*A. ranavalona*, ♂ *nec* ♀, Boisd.); *A. maransetra*, p. 2, *masamba* and *masonala*, p. 3, *A. manandaza* (=*A. ranavalona*, Boisd., ♀ *nec* ♂), p. 147, C. Ward, Ent. M. M. ix., Madagascar, spp. nn.

Nymphalides.

S. H. Scudder (Rep. Peab. Ac. iv. pp. 30–46) recharacterizes (in addition to new genera) and restricts *Doxocopa* and *Polygonia*, Hübn., *Nymphalis*, Latr., *Papilio*, Linn., *Aglais*, Dalm., *Vanessa*, Fabr., *Junonia*, Hübn., *Euptoieta*, Doubl., *Argynnis*, Fabr., and *Brenthis* and *Phyciodes*, Hübn., assigning to them as their respective types *agathina, c-aureum, polychloros, antiopa, urticæ, atalanta, lavinia, claudia, aglaia, hecate*, and *cocyta*. He also (p. 29) proposes the name *Basilarchia* (type *astyanax*) for *Callianira*, Hübn., preocc. (*nec* Westw.) [The names *Nymphalis, Papilio, Aglais*, and *Vanessa* are, strictly speaking, synonymous; and if the Linnean sections of *Papilio* are

entitled to rank as genera, the type of *Papilio* should be *atalanta*, but otherwise *antiopa*.]

On *Papilio chrithon, cujus, cicero* (= *Euthalia evelina*, Stoll), *aconthea, trullus* (= *Precis pelarga*, Fabr.), *cortina* (= *Eryolis ariadne*, var. *merione*, Cram.), *atalanta, cortes* (= *Junonia lavinia*, Cram.), *clavdia, iris, daunius* (= *Euptoieta hegesia* ♀, Cram.), *laudonius* (= *Atella phalanta*, Dru.), *clausius, goetzius, fingal, ossianus, tomyris, marphisa, rinaldus, trivia, antigonus*, and *parthenie* of Herbst, *cf.* W. F. Kirby, Tr. E. Soc. 1872, pp. 111–118.

Agraulis vanillæ. Local form from St. Bartholomew described by Wallengren, Œfv. Vet. Ak. 1871, p. 911.

Cirrochroa satellita, Butler, redescribed and figured: Lep. Ex. p. 103, pl. 38. f. 7.

C. thais, Fabr., from Ceylon and S. India, redescribed by F. Moore, P. Z. S. 1872, p. 557.

Argynnis diana, leto, and *nokemis*, Edwards (Butt. N. Amer. pt. suppl.), gives fresh plates, representing both sexes.

A. niobe and *adippe*. Their specific distinctness affirmed by Doubleday, and denied by Butler: Ent. M. M. viii. pp. 183 & 203.

A. amasia, Meigen, is probably a Californian species: G. Weymer, S. E. Z. 1872, p. 180.

A. cybele. Larva and pupa described by W. Saunders, and young larva noticed by W. H. Edwards: Canad. Ent. iv. pp. 121–123, 238 & 239.

A. mormonia, Boisd., = *montivaga*, Behr, not *nenoquis*, Reak.: W. H. Edwards, Syn. Butt. N. Amer. p. 50.

A. paphia. Newman figures 2 varieties, Ent. vi. pp. 1 & 145.

Brenthis bellona. This insect and some allies are actually single-brooded; for although several broods are hatched in the course of the year, the different series are independent of each other: S. H. Scudder, Am. Nat. vi. pp. 514–518.

Melitæa athalia. Transformations described by Buckler, Ent. M. M. viii. pp. 258–260.

M. phaeton, Fabr. Eggs, and early stages of larvæ to third moult, described by J. A. Lintner, Rep. N. York Cab. xxiii. pp. 154–157.

M. harrisi. Eggs and young larva described by W. Saunders, *l. c.* pp. 161–163. The supposed larva figured in Packard's 'Guide' is that of an *Aglossa*: G. M. Dodge, *op. cit.* pp. 198 & 199.

M. nycteis, Doubl. Larva and pupa described and pupa figured by J. A. Lintner, *l. c.* pp. 158 & 159, pl. 8. fig. 14.

Phyciodes ismeria, Boisd. & Lec. As the description and figure are irrecognizable, W. H. Edwards would retain the name *carlota*, Reak, for this species: Syn. Butt. N. Amer. p. 52.

P. orsa, Boisd., = *montana*, Behr: Edwards, *l. c.* p. 50.

Eresia. Hewitson (Ex. Butt. v. *Eres.* pl. 10) figures and redescribes his *E. neria*, f. 80, *E. clæa*, f. 81 & 82, and *E. ildica* (= *mæsta*, Salv., var. ?), fig. 84 (no fig. 79 on plate).

Grapta silenus, Edw. Edwards describes the ♂, Tr. Am. Ent. Soc. iv.

Vanessa antiopa. On its unusually frequent occurrence in Britain in 1872, *cf.* H. T. Stainton, F. B. White, and D. Sharp, Ent. M. M. ix. pp. 105–107, 130 & 131, fig.; also H. G. Knaggs, Ent. Ann. 1873, pp. 37–39; and E. New-

man & S. Stevens, Ent. vi. pp. 215–220, 236 & 237, 258 & 259. [It appears also to have been much commoner than usual throughout N. Europe in 1872.]

V. io. Newman figures a variety, *l. c.* p. 105.

V. kaschmirensis and *V. i-album* appear to be distinct from *V. urticæ* and *V. vau-album* respectively: G. Weymer, S. E. Z. 1872, pp. 180 & 181.

V. polychloros, new to Scotland, taken at Inverary: J. Garrow, Scot. Nat. i. p. 267. Dwarfed specimens bred from nettle, Ent. v. p. 88. Taken *in coitu* with *V. urticæ*, J. Clark, Ent. vi. p. 221.

V. urticæ. Imago with larval head: *id. ibid. l. c.*

V. cardui. On its distribution and representative species, *cf.* M. Wagner, SB. bayer. Ak. 1870, ii. pp. 169–171. D. Hay and F. B. White record an extraordinary flight observed off Corfu in 1842: Ent. M. M. ix. p. 149.

P. atalanta. On habits of larva, *cf.* J. A. Lintner, *l. c.* p. 183, note.

Junonia ixia, Butler, redescribed and figured, Lep. Ex. p. 85, pl. 33. fig. 1.

J. orythia, L., var. *madagascariensis*: Guénée, in Vinson, Voyage &c., Annexe F, p. 37, Madagascar.

Salamis andremiaja, Boisduval, redescribed by Guénée, *l. c.* p. 36.

Salamis duprœi redescribed and figured by Vinson, Voyage &c., Annexe iv. pp. 573–575, pl. 5, interior of Madagascar. *

Doleschallia australis, Feld., is probably distinct from *D. bisaltide*: G. Weymer, *l. c.* p. 181.

A. Guénée (Mém. Soc. Phys. Genève, xxi. pp. 381–417) monographs the genera *Callicore* (with which he unites *Perisama*) and *Catagramma*. He describes many species as new, but overlooks 18 species recently described by English authors, and one of Boisduval's. *Cf.* Hewitson, Kirby, & Guénée, Pet. Nouv. 1872, pp. 239–244.

Callicore clymena, Cram. Varr. *peruviana*, Peru, and *bisosto*, Central America, described by Guénée, *l. c.* p. 384.

Catagramma phytas, Boisd., = *Callicore anna*, Guér.; *Cat. sinamara*, Hew., = *Cat. astarte*, Cram., ♀ [?]: Hewitson & Kirby, Pet. Nouv. 1872, p. 239.

Cybdelis calamis, Hew., is a *Catagramma*: Hewitson, Ex. Butt. iv., corrections.

Panopea, Hübn., recharacterized by Guénée: Vinson, Voyage &c., Annexe F, p. 38.

Heterochroa mephistopheles, Butler, redescribed and figured, Lep. Ex. p. 101, pl. 38. fig. 4.

Limenitis mixippus and *ursula*. T. L. Mead describes varieties, Can. Ent. iv. pp. 216 & 217.

L. camilla, W. V. Lewis (Zool. s. s. vii. p. 3074, Discussion, p. 33) renames this species *anonyma*, overlooking Bergsträsser's name *drusilla*.

L. proserpina appears to be distinct from *L. ursula*: Edwards, Butt. N. Amer. pt. suppl.

L. sibylla. A black var. noticed by H. Reeks, Ent. vi. p. 171.

Neptis sappho, Kirb., *nec* Pall., = *Papilio lucilla*, W. V. [1776], *nec* Esp. [1778?], is renamed *innominata* by Lewis, Zool. (s. s.) vii. p. 3074, Discussion, p. 33.

Neptis leucothoe, Cram. (= *Acca matuta*, Hübn.), briefly characterized by Moore, P. Z. S. 1872, p. 561. The localities given by Cramer are Java,

China, and Coromandel; but those from the two latter localities are quite distinct species.

Apatura alicia ♀ = *Papilio lycaon*, Fab., *nec A. celtis*, Boisd. & Lec.: Edwards, Butt. N. Amer. pt. suppl.

A. phæacia, Hew., = *A. sordida*, Moore, ♀: Hewitson, Ex. Butt. iv., corrections.

Charaxes pleistoanax, Feld., figured by Butler, Lep. Ex. pl. 37. fig. 3.

C. polyxena, Cram., varies to such an extent that no two specimens are alike: G. Weymer, S. E. Z. 1872, p. 180.

New genera and species:—

Speyeria, Scudder, Rep. Peab. Ac. iv. p. 44. Type *Pap. idalia*, Dru.

Charidryas, id. *l. c.* p. 47. Type *Melitæa nycteis*, Doubl.

Limnœcia, id. *l. c.* Type *Melitæa harrisi*, Scudd.

Euphydryas, id. *l. c.* p. 48. Type *Pap. phaeton*, Drury.

Cethosia mahratta, Moore, P. Z. S. 1872, p. 556 (= *Papilio cyane*, Cram., *nec* Dru.), Malabar.

Cirrochroa lanka, Ceylon, S. India, p. 557; *C. mithila*, Bengal, p. 558: *id. l. c.*

Cynthia asela, id. *l. c.* p. 558, Ceylon.

Argynnis bremneri, San Juan I., p. 63; *A. inornata*, California, p. 64; *A. eurynome*, p. 66, and *A. meadi*, p. 67, Colorado: W. H. Edwards, Tr. Am. Ent. Soc. iv.

Melitæa thekla, id. *l. c.* iii. p. 191, California.

Phyciodes fulviplaga, Butler, Cist. Ent. iv. p. 77; *P. niveinotis*, Butler & Druce, *l. c.* v. p. 100, Costa Rica.

Eresia dismorphina, Butler, *l. c.* iv. p. 78, Costa Rica; *E. margaretha*, N. Granada, *levina*, Columbia, *quintilla*, Ecuador: Hewitson, Ex. Butt. v. *Eres.* pl. 10. figs. 77 & 78, 83.

Symbrenthia brabira, N. India, p. 558, *niphanda*, Sikkim Himalayas, p. 559: Moore, *l. c.*

Grapta agnicola, id. *l. c.* p. 559, Nepal, Goolmurg; *G. hylas*, W. H. Edwards, *l. c.* iv. p. 68, Colorado.

Vanessa æquatorialis, M. Wagner, SB. bayer. Akad. 1870, ii. p. 171, Chimborazo, Pinchacha; *V. rizana*, Moore, *l. c.* p. 559, Middle Kunawur.

Presis hopfferi, Möschler, S. E. Z. 1872, p. 337, Silhet.

Crenis benguelæ, Chapman, Ent. M. M. viii. p. 175, S.W. Africa.

Epiphile grandis, Butler, Cist. Ent. iv. p. 76, Costa Rica.

Myscelia pattenia (= *M. cyananthe* ♀, Feld. ?), Butler & Druce, Cist. Ent. v. p. 101, Costa Rica.

Callicore elinda and *aurelia*, hab. — ?; *C. bourcieri*, Peru, p. 385; *C. serofa* (= *C. clymenus*, Hübn. Samml. figs. 1 & 2, *nec* 3 & 4), Para, p. 386; *C. dodone*, Columbia; *C. granatensis* [= *C. neglecta*, Salv.], N. Granada; *C. nystographa*, Quito, p. 387; *C. pavira* [= *C. euclides*, Latr. ?], Peru, p. 388; *C. cœlinula* [= *C. clymenus*, Hübn. Zutr. f. 583 & 584], Brazil, p. 389; *C. brevipalpis* [= *elvina*, var., Hew. ?, = *lidwina*, Feld. ?], Venezuela, p. 390; *C. carmen*, Brazil, p. 392; *C. equatorialis* [= *bonplandi*, var., Hew.], Quito; *C. picteti*, Peru, p. 395; *C. jurinii* [= *C. euriclea*, Doubl. & Hew. ?], Peru, p. 396, plate, f. 6; *C. saussurii*, Brazil, p. 398; *C. tringa* [= *humboldti*, Hew., var. ?], p. 401; *C.* ?? *laxis*, Peru, p. 402. Guénée, Mém. Soc. Phys. Genève, xxi.

Catagramma dulima, p. 408, *cajetani*, p. 410, *mellii* (= *C. hesperis*, Guér.?), p. 413, Peru, *oculata*, hab. —?, p. 414, plate, fig. 7: Guénée, *l. c.*

Megalura valetta, Butler & Druce, *l. c.* p. 101, Costa Rica.

Diadema ruhama, Hewitson, Ent. M. M. ix. p. 84, Angola; *D. usambara*, Ward, *op. cit.* p. 148, Ribé, E. Africa.

Panopea glaucina, Guénée, in Vinson's 'Voyage' &c., Annexe F, p. 38, pl. vi. figs. 1 & 2, Madagascar.

Lebadea austenia, Moore, *l. c.* p. 560, pl. 32. fig. 1, Khasia Hills.

Heterochroa demialba, Butler, *l. c.* iv. p. 77, Lep. Ex. p. 103, pl. 38. fig. 2; *H. lucina* and *H. tracta*, *l. c.* p. 102, pl. 38. figs. 5 & 6, Costa Rica.

Iæra duodecimpunctata, Snellen, Tijdschr. Ent. (2) vii. p. 15, pl. 1. figs. 1–3, Lower Guinea.

Neptis astola, *N. mahendra*, N.W. Himalayas, p. 560; *N. varmona*, mountains of S. India; *N. emodes*, f. 2, S.E. Himalayas; *N. surakarta*, Java; *N. ophiana*, Sikkim, p. 561; *N. khasiana*, f. 7, Khasia Hills; *N. cartica*, Nepal, p. 562; *N. clinia*, f. 5, Bengal; *N. adipala*, f. 8, Khasia Hills; *N. susruta*, f. 4, N. India; *N. viraja*, f. 6, N.E. Bengal, p. 563. Moore, *l. c.* pl. 32.

Athyma zerosa, Moore, *l. c.* p. 564, Khasia Hills.

Apatura plesaurina, Butler & Druce, *l. c.* v. p. 102, Costa Rica.

Charaxes khimalara, p. 97, f. 1 (= *hierax* ♀, Feld.), N.W. Himalayas, Nepal, *khasianus*, p. 98, f. 6, Khasia Hills, N.E. Bengal, *jalinder*, p. 98, f. 4 (= *hipponax* ♀, Feld.), N.E. Himalayas, *hindia*, p. 99, f. 5, Darjeeling, *lunawara*, p. 99, f. 2, N.E. Bengal: Butler, Lep. Ex. pl. 37; *C. wallacii*, p. 100, pl. 38. f. 2, Menado, *aruanus*, p. 100, Aru (= *papuensis* ♀, Butl. olim): *id. l. c.*; *C. analava*, Ward, *l. c.* p. 3; *C. antamboulon* [= *candiope*, Godt., var.?], *antanala* [= *cacuthis*, Hew., *teste* Hew. in litt.], p. 1, *betsimisaraka*, p. 2, *betunimena*, p. 3, Lucas, Ann. Sc. Nat. xv. no. 22, all from Madagascar.

Philognoma falcata, Butler, Lep. Ex. p. 101, pl. 38. fig. 1, Gold Coast, Ashanti.

Paphia herbacea, Butler & Druce, Cist. Ent. v. p. 100, Costa Rica.

Morphides.

Morpho alexandra, Hew., = *godarti*, Guér., = *menelaus*, Bolivian form, albino; *M. psyche*, Feld., = *hebe*, Westw.; *M. perseus*, Cram., = *telemachus*, Cram. [= *crameri*, Kirb.], = *metellus*, Cram.?; *M. luna*, Butl., = *polyphemus*, Doubl. & Hew., var.; *M. æga*, Hübn., is distinct from *adonis*, Cram.; *M. theseus*, Deyr., is allied to *hercules*, Dalm. Deyrolle, Pet. Nouv. 1872, p. 175.

M. telemachus, Cram., probably = *metellus*, Cram., blue var: Oberthür, *op. cit.* pp. 175 & 176. He also corroborates Deyrolle's remarks on the other species.

M. sulkowskii, Koll., with aberrant neuration, figured and described by Butler, Lep. Ex. p. 113, pl. 42. figs. 1 & 1 *a*.

E. Deyrolle (*l. c.* pp. 224 & 225) thus divides the species of *Morpho* of the *Achilles* group:—1. *M. pelcides*, Koll., = *corydon*, Guén., varr. *montezuma*, Guén., *thetis*, Butl., *octavia*, Bates, *hyacinthus*, Butl., and *briseis*, Feld. 2. *M. granatensis*, Feld. 3. *M. helenor*, Seba, = *achillena*, Hübn., var. *achillides*, Feld. 4. *M. achilles*, L., = *helenor*, Cram., = *leonte*, Hübn., varr. *cœlestis* and *vitrea*, Butl. 5. *M. deidamia*, Mer., = *achilles*, Cram., var. *patroclus*, Feld., = *neoptolemus*, Bates.

Morpho thalpius, Hübn.,= *Prepona demophon*, L.: W. F. Kirby, Pet. Nouv. 1872, p. 288.

Morpho limpida, Cist. Ent. v. p. 75, *aquarius*, *marinita*, and *hydorina* (=*limpida*, var.): Butler, *l. c.* pp. 74 & 75, Lep. Ex. p. 113, pl. 41. figs. 1 & 2, pl. 42. fig. 2, Costa Rica, spp. nn.

Brassolides.

Papilio 10-*punctata*, Goeze,= *Clerome eumeus*, Dru.; *Opsiphanes cassina*, Feld.,= *O. cassiæ*, L.; *O. æthon*, Fabr.,= *O. berecynthus*, Cram., ♂; *Caligo arisbe*, Hübn.,= *C. taramela*, Godt.; *Papilio automedon*, Cram.,= *Eryphanis polyxena*, Meerb. W. F. Kirby, Pet. Nouv. 1872, p. 288.

Pavonia euphorbus, Feld., redescribed and figured by Deyrolle, R. Z. xxiii. p. 64, pls. 9 & 11.

P. eurylochus, Cram. Var. *brasiliensis*, Feld., is specifically distinct from the type: *id. l. c.* pp. 19 & 20.

Dynastor stygianus, sp. n., Butler, Cist. Ent. iv. p. 73, Costa Rica.

Caligo bubocula, sp. n., *id. l. c.* p. 74, Costa Rica.

Pavonia oberthuri, p. 20, pl. 1, hab. —?, *suzanna*, p. 275, pls. 24 & 26, Bogota: Deyrolle, *l. c.*, spp. nn.

Satyrides.

On *Papilio anacardii* (= *Hætera piera*, L.), *zitenius* (prior to *Hipio vamana*, Moore), *suwarovius*, *syllius*, *procida*, *hannibal*, *hamilcar*, *mineus*, *iphigenus*, *hippolytus*, *tyndarellus*, *cyrillus*, *medea*, *medusa*, *æthiops*, *maccabæus*, and *melas*, of Herbst, *cf.* W. F. Kirby, Tr. E. Soc. 1872, pp. 113–116.

Lethe distans, figs. 4, 6, & 7, *L. alberta*, fig. 5, redescribed and figured by Butler, Lep. Ex. p. 87, pl. 33.

Cyllo leda, Linn., from Lower Guinea, *cf.* P. C. T. Snellen, Tijdschr. Ent. (2) vii. p. 12.

Argus, Scop. Scudder (Rep. Peab. Acad. iv. p. 27) selects *Papilio eurydice*, L., as the type of this genus, and recharacterizes it accordingly.

Palæonympha opalina redescribed and figured by Butler, *l. c.* p. 86, pl. 33. fig. 3.

The genera *Pseudonympha*, Wgr., and *Erebia*, Dalm., are quite distinct: Wallengren, Œfv. Vet. Ak. 1872, p. 42.

Erebia ligea new to Belgium: L. Quaedvlieg, Ann. E. Belg. xv. pp. 7 & 8.

E. melampus. Pupa, *cf.* Zeller, S. E. Z. 1872, pp. 42 & 43.

Cœnonympha symphita, Led. ♀ described by G. v. Emich, Hor. Ent. Ross. ix. p. 41.

Chionobas stretchi = *Satyrus ridingsi*: Edwards, Syn. Butt. N. Amer. p. 50.

Melanargia galathea. A black var. figured and described by E. Newman, Ent. vi. pp. 58 & 59.

M. pherusa. Larva described by von Kalchberg, S. E. Z. 1872, p. 408.

Pararge hiera. On its relationship to its allies, *cf.* Zeller, *l. c.* pp. 46 & 47.

P. megæra. A var. figured and described by E. Newman, *l. c.* p. 129. On the supposed occurrence of var. *lyssa* in England, *cf.* Websdale & Doubleday, Ent. vi. p. 12.

Satyrus semele. Hermaphrodite described by O. Nickerl, Verh. z.-b. Wien, xxii. p. 728.

[*H*] *Yphthima asterope*, Kl. : *cf.* Snellen, *l. c.* p. 14.

Pronophila. Hewitson (Ex. Butt. v.) figures and redescribes his *P. pæania*, *Pron.* pl. 6. fig. 37, *pomponia* and *tena*, *Pron.* pl. 7. figs. 43, 44, & 49.

Satyrites reynesi, g. & s. nn., Scudder, R. Z. xxiii. pp. 66–72, pl. 7, Provence (fossil). Allied to *Debis*. He remarks on the affinity between the fossil fauna of S. France and the existing fauna of India.

Drucina, g. n., Butler, Cist. Ent. iv. p. 72. Allied to *Pronophila*. Type *D. leonata*, sp. n., *id. l. c.*, Costa Rica.

New species :—

Lethe sihala, Moore, P. Z. S. 1872, p. 555, Ceylon.

Debis deliades and *dolopes*, Hewitson, Ent. M. M. ix. pp. 84 & 85, Darjeeling.

Euptychia argentella and *insolata*, Butler & Druce, Cist. Ent. v. pp. 98 & 99, Costa Rica.

Erebia dabanensis, Erschoff, Hor. Ent. Ross. viii. p. 315, Irkutsk ; *E. meadi*, W. H. Edwards, Tr. Am. Ent. Soc. iv. p. 70, Colorado ; *E. haydeni*, id. Rep. of U.S. Geol. Surv. of Montana &c. p. 467, Yellowstone ; *E. pluto*, R. W. Fereday (not characterized), Tr. N. Z. Ins. iv. p. 217, high mountains of New Zealand.

Callerebia orixa, Moore, *l. c.* p. 555, Khasia Hills.

Lasiommata lybnessa, Hewitson, *l. c.* p. 85, New Caledonia.

Satyrus charon, Edwards, Tr. Am. Ent. Soc. iv. p. 69, Colorado.

Mycalesis antahala, Ward, Ent. M. M. ix. p. 148, Madagascar.

[*H*] *Yphthima vinsoni*, Guénée, Vinson's 'Voyage' &c., Annexe F, p. 39, Madagascar.

Pedaliodes hulda and *lithochalcis*, Butler & Druce, *l. c.* v. pp. 99, 100, Costa Rica.

Oxeoschistus euriphyle, Butler, *l. c.* iv. p. 73, Costa Rica.

Pronophila palades, f. 37, 39 (=*circe*, var.), *persepolis*, f. 38, 42, *parthyene*, f. 40 & 41, Hewitson, Ex. Butt. v. *Pron.* pl. 6 ; *P. pasicles*, f. 45, *pheretias*, f. 46, *parrhœbia*, f. 47, 50, and *philonis*, f. 48, *id. l. c.* pl. 7, all from Ecuador.

Taygetis umbracea and *incerta*, Butler & Druce, *l. c.* v. p. 98, Costa Rica.

Eurytelides.

Melanitis. *Papilio undularis*, Dru., is the type according to Latreille. W. F. Kirby, Tr. E. Soc. 1872, p. 115.

Eurytela narinda, sp. n., Ward, Ent. M. M. ix. p. 148, Madagascar.

Libytheides.

E. Newman proposes to unite this family with the *Satyrides*. Zool. (s. s.) vii. p. 2888.

Libythea rama, Moore, P. Z. S. 1872, p. 555, Ceylon.

Erycinides.

Papilio eustachius, Herbst, has priority over *Euselasia mys*, H.-S. ; and *Mesosemia formosa*, Hew., probably = *Papilio nina*, Herbst. W. F. Kirby, Tr. E. Soc. 1872, pp. 115, 117.

Eurygona labiena, Hew.,? = *E. chrysippe*, Bates: Hewitson, Ex. Butt. iv., corrections.

E. argentea, Hew., figured and redescribed, *l. c.* v. *Eur.* pl. 10. figs. 98–100.

Esthemopsis. Hewitson figures and redescribes *E. sericina*, Bates, and var. *colaxes*, Hew., *E. celina* and *E. alicia*, var., Bates, *l. c. Necyria* and *Esth.* figs. 1–4.

Emesis. Hewitson (*l. c. Em.* pl. 1) figures and redescribes his *E. angularis* and *lacrines*, figs. 1 & 2, *E. cilix*, figs. 5 & 6, and *E. fastidiosa*, Ménétr., var., fig. 8.

E. tepahi, ♂, described by Guénée, in Vinson's Voy. à Madagasc. Annexe F, p. 39.

Lemonias. Hewitson (*l. c. Lem.* pl. 5) figures and redescribes *L. thara*, Hew., var. (♀ = *melia*, Bates), figs. 41 & 42, *amphis*, Hew., fig. 43, *pione*, Bates, fig. 46, *lasthenes*, *amasis*, and *luceres*, Hew., figs. 47–49.

Compsoteria, Hew., = *Ithomiola*, Feld.: Hewitson, *l. c.* iv., corrections.

New species:—

Mesosemia frequens, Butler & Druce, Cist. Ent. v. p. 104, Costa Rica.

Eurygona regipennis and *aurantia*, Butler & Druce, *l. c.* p. 103, Costa Rica.

E. eurysthenes, Ecuador, f. 93 & 94, *eucerus*, Brazil, f. 95–97, *eucrates*, and *eurymachus*, figs. 101–104, Ecuador. Hewitson, Ex. Butt. v. *Eur.* pl. 10.

Methonella chrysomela, Butler, Cist. Ent. iv. p. 78, Costa Rica, Bogota.

Necyria ingaretha, Nicaragua, *vetulonia*, Ecuador. Hewitson, *l. c. Nec.* & *Esthemopsis.*

Emesis oliviæ, p. 103, Costa Rica, S. America, *furor*, p. 104, Costa Rica, Honduras: Butler & Druce, *l. c. E. neemias*, figs. 3 & 4, *zelotes*, fig. 7, Brazil: Hewitson, *l. c. Em.* pl. 1.

Lemonias adelina, Butler, *l. c.* p. 79, Costa Rica; *L. byzeres*, figs. 39 & 40, *zerna*, figs. 44 & 45, Brazil, Hewitson, *l. c. Lem.* pl. 5.

Pandemos nymphidioides, Butler, *l. c.* p. 79, Costa Rica.

Lycænides.

S. H. Scudder (Rep. Peab. Ac. iv. pp. 50–58) recharacterizes and restricts the genera *Thecla*, Fabr., *Strymon* and *Lycæides*, Hübn., *Cyaniris*, Dalm., *Everes* and *Chrysophanus*, Hübn., *Lycæna*, Fabr., and *Feniseca*, Grote, assigning to them as their respective types *spini*, *titus*, *argus*, *argiolus*, *amyntas*, *hyllus*, *phlæas*, and *tarquinius*.

On *Papilio pulsius*, *esra*, *hylassus* (prior to *Plebeius enchylas*, Hübn.), *pelopus*, *cyllarissus*, *silenissa*, *eryssus*, *amelia*, *amyntor*, *hesiodus*, *amor*, *lincus*, *plato*, *telicanus*, *cerasi*, *cyllarus*, *dymus*, *semiargus*, *zachæus*, *nanus*, *tespis*, and *arites*, of Herbst, *cf.* W. F. Kirby, Tr. E. Soc. 1872, pp. 115–120.

Thecla lara, L., is not congeneric with *ora*, Cram. Wallengren, Œfv. Vet. Ak. 1872, p. 47.

T. liparops, Boisd. & Lec. As the plate and description are irrecognizable, W. H. Edwards would retain the name *strigosa*, Harr., for this species. Syn. Butt. N. Amer. p. 51.

T. melantho, Klug, is certainly the Caucasian var. of *T. spini*. C. Oberthur, R. Z. xxiii. p. 482.

T. timon. On Donovan's figure, *cf.* Westwood, Tr. E. Soc. 1872, p. 109.

Polyommatus xanthe, Fabr., var. ♀, from Asia Minor, described by C. Oberthur, *l. c.* p. 482.

Lycæna. On the African species, with special reference to *asteris*, Gdt., *anubis*, n. sp., *asopus*, Hopff., *gamra*, Led., and *lysimon*, Hb., from Lower Guinea, *cf.* P. C. T. Snellen, Tijdschr. Ent. (2) vii. pp. 16–25.

L. ripperti, actis, erschoffi, damon, posidon, iphigenia, damone, dolus, menalcas, and *hopfferi* are probably all one species. C. Oberthur, *l. c.* p. 484; Pet. Nouv. 1872, p. 220. He also thinks that *L. adonis, polona, corydonius, corydon,* and *albicans* are likewise one species.

L. dolus. L. hopfferi and *epidolus* are probably varr. of this species: Oberthur, R. Z. xxiii. p. 484.

L. argus. L. ægon and *zephyrus* are probably varr. of this: *id. l. c.* p. 485.

L. cyllarus. L. cœlestina is perhaps an Oriental var. of this: *id. ibid.*

L. corydon and *adonis.* Deyrolle considers them distinct species: *op. cit.* pp. 227, 228. On the difference between their females, *cf.* W. H. Tugwell, Ent. vi. p. 58.

L. ægon. A specimen combining the two forms of female in one individual noticed by F. Bond, P. E. Soc. 1872, p. 43.

L. amyntas is double-brooded. E. Lefevre, Pet. Nouv. 1872, p. 243.

L. anteros, var., from Asia Minor, described by C. Oberthur, *l. c.* p. 483.

L. argus, hermaphrodite, described by O. Nickerl, Verh. z.-b. Wien, xxii. p. 727.

L. arion. A var. from the Grisons described by Zeller, S. E. Z. 1872, p. 40.

L. pylaon, var. or sp. n., from Asia Minor: C. Oberthur, *l. c.* p. 484.

L. asteris, Godt., redescribed and figured by Snellen, from Lower Guinea, Tijdschr. Ent. (2) vii. p. 18, pl. 1. f. 4, 5.

L. cilla, Behr, = *L. tehama,* Reak.: W. H. Edwards, *l. c.* p. 51.

Cupido metophis, Wallengren, redescribed, *l. c.* p. 48.

New genera and species:—

Mimacrea, Butler, Lep. Ex. p. 104. Allied to *Pentila.* Type *M. darwinia,* sp. n., *l. c.* pl. 38. fig. 8, West Africa.

Arrugia, Wallengren, Œfv. Vet. Ak. 1872, p. 47. Types *Papilio protumnus,* L., and *Zerythis basuta,* Wgr.

Callipareus, Scudder, Rep. Peab. Ac. iv. p. 51. Type *Strymon melinus,* Hübn.

Mitoura [*Mitu-*], Scudder, *l. c.* p. 52. Type *Thecla smilacis,* Boisd. & Lec.

Incisalia, Scudder, *l. c.* p. 52. Type *Licus niphon,* Hübn.

Erora, Scudder, *l. c.* p. 53. Type *Thecla læta,* Edw.

Glaucopsyche, Scudder, *l. c.* p. 54. Type *Lycæna lygdamus,* Doubl.

Iolaus inores, Hewitson, Ent. M. M. ix. p. 85, hab. —?

Strymon pastor, agricolor [!], and *cælicolor,* Butler & Druce, Cist. Ent. v. pp. 105 & 106, Costa Rica.

Mithras augustinus, Butler & Druce, *l. c.* p. 106, Costa Rica.

Bithys azurinus and *hesperitis,* Butler & Druce, *l. c.* p. 107, Costa Rica.

Tmolus crolinus, invius, halciones, isobeon, vespasianus, charichlorus, and *denarius,* Butler & Druce, *l. c.* pp. 107–109, Costa Rica.

Lampides zachæina, Butler & Druce, *l. c.* p. 104, Costa Rica.

Lycæna anubis (and var. *phoa,* p. 24), Snellen, Tijdschr. Ent. (2) vii. p. 21, pl. 1. f. 6–9, Lower Guinea.

Lucia emperamus, id. l. c. p. 25, pl. 2. f. 1–3, Lower Guinea.

Hesperiides.

S. H. Scudder (Rep. Peab. Ac. iv. pp. 68–82) makes the following corrections of synonymy:—*Goniloba cariosa*, H.-S., = *Thymele santiago*, Luc.; *Syrichthus albus*, Edw., = *Leucoscirtes ericetorum*, Bd.; *Papilio orcus*, Cr., = *P. oileus*, auctt. *nec* L., = *Hesperia syrichthus*, F.; *H. wyandot*, Edw., = *H. centaureæ*, Ramb.; *H. ricara*, Edw., = *H. ruralis*, Bd.; *Thymelicus puer*, Hb., = *Heteropterus marginatus*, Harr., = *Ancyloxypha numitor*, F.; *Hesperia minima*, Edw., = *Thymelicus waco*, Edw.; *H. mingo*, Edw., = *Potanthus omaha*, Edw.; *H. mesapano*, Sc., ? = *Cyclopides mandan*, Edw.; *H. hegon*, Sc., = *H. nemoris*, Edw., = *H. alternata*, Gr. & Rob., = *Amblyscirtes samoset*, Sc.; *H. oneko*, Sc., = *H. wakulla*, Edw., = *Stomyles textor*, Hb., from Florida, not Connecticut; *Papilio vitellius*, Sm. & Abb. (? F.), = *Atrytone iowa*, Sc.; *Hesperia delaware*, Edw., = *A. logan*, Edw.; *H. hobomok*, Harr., = *H. pocahontas* and *quadaquina*, Sc., = *A. zabulon*, Bd. & Lec.; *H. colon*, F. (? = *H. vitellius*, F.), = *Euthymus phylæus*, Dru.; *H. comma*, Bd. (*nec* L.), from California, is renamed *Pamphila juba*, Sc.; *H. dacotah*, Edw. [MS. ?], = *H. melane*, Edw., = *Pamphila napa*, Edw.; *H. wamsutta*, Harr., = *Polites peckius*, Kb.; *H. yreka*, Edw., = *Ochlodes nemorum*, Bd.; *Hesperia wingina*, Sc., = *Hedone brettus*, Bd. & Lec.; *Hesperia otho*, Bd. & Lec. (*nec* Sm. & Abb.), = *H. egeremet*, Sc., = *Hedone ætna*, Bd.; *Hesperia acanootus*, Sc., = *Limochores bimacula*, Gr. & Rob.; *Talides vestris*, Btl. (*nec* Bd.), = *Limochores manataqua*, Sc.; *Hesperia phocion*, F., = *H. themistocles*, Gdt., = *H. cernes* and *arogos*, Bd. & Lec., = *H. ahaton*, Harr., = *L. thaumas*, F.; *Pamphila rurea*, Edw. (? = *Hesperia kiowah*, Rk.), = *Euphyes metacomet*, Harr.; *H. ophis*, Edw., = *Prenes panoquin*, Sc., hab. S. Carolina to Key West, not Connecticut; *H. mesogramma*, Poey (*nec* Latr.), = *Pansydia cunaxa*, Hew.; *H. adela*, Hew., = ? *Perichares trinitad*, Lef.; *H. chemnis*, F., = *Eudamus olynthus*, Bd. & Lec., = *Calpodes ethlius*, Cr.; *H. monoco*, Sc., = *H. nortoni*, Edw., = *H. punctella*, Gr. & Rob., = *Lerema accius*, Sm. & Abb.

Butler (Lep. Ex. pl. 40) figures and redescribes his *Telegonus omphale* and *Æthilla jaira*, p. 110, figs. 10 & 11; *Æ. jariba* and *Typhedanus evelinda*, p. 111, figs. 3, 5; *T. zephus*, f. 12; *Augiades despecta* and *lemna*, figs. 7, 9, p. 112.

Anastrus obscurus, Hübn., is distinct from *Achlyodes corbulo*, Cram.; *Papilio telegonus*, Esp., = *Thracides salius*, Cram.; *Antigonus westermanni*, Latr., and *erosus*, Hübn., are sexes of the same species. G. Weymer, S. E. Z 1872, p. 182.

Hesperia. Hewitson (Ex. Butt. v. *Hesp.* pl. 5. figs. 42–49) figures and redescribes his *H. ceraca*, *chalestra*, *argentea*, and *ethoda*.

H. adela, Hew., = *H. corydon*, Fabr.; *H. phœnicis*, Hew., = *H. praba*, Moore: Hewitson, *l. c.* iv., corrections.

H. hobomok, Harr. *H. pocahontas*, Scudd., is a melanic female variety of this species: Strecker, Lepidoptera, p. 7.

Limochores bimacula, Scudd., redescribed by C. S. Minot, Canad. Ent. iv. p. 150.

Pamphila marshali, Boisd., redescribed and figured by Snellen, Tijdschr. Ent. (2) vii. p. 29, pl. 2. figs. 7–9, from Lower Guinea.

Syrichthus andromedæ and *centaureæ*: *cf.* Zeller, S. E. Z. 1872, pp. 48 & 49.

Cyclopides, Hübn., and *Carterocephalus*, Led. Cat., are properly characterized, with *steropes*, W. V., and *paniscus*, Sulz., as their respective types. Snellen, Vlinders, pp. 82 & 83.

Cyclopides lepeletieri, Latr., redescribed and figured by Snellen, *l. c.* p. 32, pl. 2. figs. 13 & 14, from Lower Guinea.

Nisoniades. J. A. Lintner (Rep. N. Y. S. Cab. xxiii. pl. 7) describes and figures *N. icelus*, p. 162, figs. 5 & 6, and *N. lucilius*, p. 164, figs. 1 & 2 (both previously known only by the descriptions of the ♂ genital segments by Scudder & Burgess, in P. Bost. Soc. xiii.; *cf.* Zool. Rec. vii. p. 398); and figures *N. martialis*, Scudd., figs. 7 & 8, *N. persius*, Scudd., figs. 3 & 4, and *N. brizo*, Boisd. & Lec., figs. 9 & 10.

Antigonus flyas, Cram. (=*philemon*, Fabr.,=*velasquez*, Lef.) and *ostrevs*, Cram. (=*zephodes*, Hübn.), have been taken *in coitu*, and may be sexes of the same species. Wallengren, Œfv. Vet. Ak. 1871, p. 913.

S. H. Scudder (Rep. Peab. Ac. iv.) proposes a great number of new generic names, indicating the types, but without characters (*Callimormus* excepted). They are as follows, with the types in brackets:—*Dysenius* (*Erycides albicilla*, H.-S.), p. 67; *Achalarus* (*Papilio lycidas*, Sm. & Abb.), *Acolastus* (*Hesperia savignii*, Latr.); *Thorybes* (*Papilio bathyllus*, Sm. & Abb.), p. 71; *Pholisora* (*Papilio catullus*, F.), p. 72; *Leucoscirtes* (*Syrichthus ericetorum*, Bd.), p. 73; *Callimormus*, p. 74, type *C. juventus*, sp. n.; *Oarisma* (*Hesperia powesheik*, Park.); *Potanthus* (*H. omaha*, Edw.); *Amblyscirtes* (*H. vialis*, Edw.), p. 75; *Stonyles* (*Pyrgus textor*, Hb.); *Ocytes* (*H. metea*, Sc.); *Poanes* (*H. massasoit*, Sc.), p. 76; *Phycanassa* (*H. viator*, Edw.); *Atrytone* (*H. iowa*, Sc.); *Euthymus* (*Papilio phylæus*, Dru.), p. 77; *Atalopedes* (*H. huron*, Edw.); *Anthomaster* (*H. leonardus*, Harr.); *Polites* (*H. peckius*, Kb.); *Ochlodes* (*H. nemorum*, Bd.), p. 78; *Choranthus* (*H. radians*, Lef.); *Hedone* (*H. brettus*, Bd. & Lec.), p. 79; *Limochores* (*H. manataaqua*, Sc.); *Euphyes* (*H. metacomet*, Harr.); *Lerodea* (*H. enfala*, Edw.), p. 80; *Prenes* (*H. panoquin*, Sc.); *Pansydia* (*H. mesogramma*, Poey); *Perichares* (*Papilio corydon*, F.), p. 81; *Oligoria* (*H. maculata*, Edw.); *Cymænes* (*Cobalus tripunctus*, H.-S.); *Lerema* (*Papilio accius*, Sm. & Abb.), p. 82; *Megathymus* (*H. yuccæ*, Bd. & Lec.), p. 83.

Arteurotia, g. n., Butler and Druce, Cist. Ent. v. p. 112. Allied to *Spathilepia* and *Hydræcomia*. Type *A. tractipennis*, sp. n., *id. l. c.*, Costa Rica.

New species:—

Pyrrhopyga venezuelæ, Venezuela, *cholybea*, Mexico: Scudder, *l. c.* p. 67.

Dysenius cruentus, id. *l. c.*, Guatemala.

Erycides viola, Butler, Cist. Ent. iv. p. 86; *E. socius*, Butler & Druce, *l. c.* v. p. 112, Costa Rica; *E. texana* and *E. sanguinea*, Scudder, *l. c.* p. 68, Texas.

Carystus gemmatus, Butler, *l. c.* iv. p. 86; *C. deceptus* and *epicincea*, Butler & Druce, *l. c.* v. pp. 112 & 113, Costa Rica.

Thymele vitreus[*-rea*], p. 68, Venezuela, *sumichrasti* and *montezuma*, pp. 69, 70, Tehuantepec, *domingo*, Hayti, p. 69: Scudder, *l. c.*

Goniurus zilpa, Butler, Lep. Ex. p. 109, pl. 40. f. 2, Costa Rica.

Epargyreus orizaba, Scudder, *l. c.* p. 70, Guatemala.

Thorybes nevada [*-dæ*], id. *l. c.* p. 71, Sierra Nevada, California.

Telegonus imalena, Butler, *l. c.* fig. 1, Costa Rica.

Goniloba cretacea, Snellen, Tijdschr. Ent. (2) vii. p. 27, pl. 2. figs. 4–6, Lower Guinea.

Eudamus vectilucis, Butler, *l. c.* fig. 6, Costa Rica.

Æthilla lavochrea, id. *l. c.* p. 110, fig. 4, Costa Rica.

Spathilepia terranea, id. *l. c.* p. 111, fig. 8, Costa Rica.

Achlyodes sempiternus and *viridiceps*, Butler & Druce, Cist. Ent. v. pp. 114, 115, Costa Rica.

Helias luctifera, iid. *l. c.* p. 115, Costa Rica.

Nisoniades ausonius, Lintner, N. Y. S. Cab. xxiii. p. 166, pl. 7. figs. 11 & 12, Center, N. Y.

Thanaos invisus, Butler & Druce, *l. c.* p. 114, Costa Rica.

Pholisora azteca, Scudder, *l. c.* p. 72, Tehuantepec.

Leucoscirtes nivea, id. *l. c.* p. 73, Tehuantepec, Guatemala.

Hesperia tessellata, id. *l. c.* p. 73 (= *Syrichthus oileus*, Bd. *nec* L.), N. America; *H. mango*, Guénée, in Vinson's 'Voyage' &c., Annexe F, p. 40, Madagascar; *H. illinois*, G. M. Dodge, Canad. Ent. iv. p. 217, Illinois (= *H. acanootus*, Scudd., *id. op. cit.* v. p. 60).

Syrichthus communis, Grote, Canad. Ent. iv. p. 69, Central Alabama (= *H. tessellata*, Scudd.; but the dates are doubtful: Grote, *l. c.* p. 220).

Callimormus juventus, Scudder, *l. c.* p. 74, Panama.

Ancyloxypha brunnea, id. *l. c.*, Guatemala.

Potanthus californicum, id. *l. c.* p. 75, California.

Cyclopides abjecta, Snellen, *l. c.* p. 32, pl. 2. figs. 15 & 16, Lower Guinea.

Amblyscirtes tolteca, Scudder, *l. c.* p. 76, Tehuantepec.

Ocytes seminolæ, id. *l. c.*, Florida to Texas.

Pamphila incerta, Snellen, *l. c.* p. 29, pl. 2. figs. 10–12, Lower Guinea; *P. uniformis* and *inimica*, Butler & Druce, *l. c.* pp. 113 & 114, Costa Rica; *P. columbia*, Scudder, *l. c.* p. 77, California.

Phlebodes justinoides, Butler & Druce, *l. c.* p. 113, Costa Rica.

Ochlodes sonora, Scudder, *l. c.* p. 78, Sierra Nevada, California.

Hedone præceps, Tehuantepec, *orono*, ? Northern States, *id. l. c.* p. 79

Lerodea inca, id. *l. c.* p. 80, Peru.

Prenes hecebolus, id. *l. c.* p. 81, Tehuantepec.

Perichares marmorata, id. *l. c.* p. 81, Venezuela.

Lerema patteni, id. *l. c.* p. 82, Guatemala.

HETEROCERA.

STRETCH, R. H. Illustrations of the *Zygænidæ* and *Bombycidæ* of North America. I. Parts 1–7. June to Dec. 1872. San Francisco: 8vo, pp. 1–184, pls. 1–7.

P. C. ZELLER ("Beiträge zur Kenntniss der nordamerikanischen Nachtfalter, besonders der Microlepidopteren," Verh. z.-b. Wien, xxii. pp. 447–560, pls. 2 & 3) describes a great number of new and little-known species.

For a list of North-American *Heterocera* contained in Guénée's 'Species Général,' vols. v.–x. *cf.* J. A. Lintner, Rep. N. Y. S. Cab. xxiii. pp. 198–212.

A. GÄRTNER records 93 additional species of *Geometræ* and *Microlepidoptera* as found in the neighbourhood of Brünn, and makes many notes on their transformations. Verh. Ges. Brünn, viii. pp. 63–90.

On certain coast insects [*Heterocera*] found existing inland at Brandon, Suffolk, *cf.* C. G. Barrett, Tr. Norw. Soc. 1870–71, pp. 61–65; 1871–72, pp. 40–42.

On the destructive larvæ of various *Bombyces*, *cf.* Breyer, Ann. E. Belg. xv. pp. 121–127.

On a new moth-trap, *cf.* Peyerimhoff, Pet. Nouv. 1872, pp. 247, 248.

Micro-Lepidoptera. On various species: *id. l. c.* pp. 239 & 240.

On denuding wings, *cf.* V. T. Chambers, Canad. Ent. iv. pp. 41–42.

On collecting and preparing, *cf.* E. L. Ragonot, Pet. Nouv. 1872, pp. 256, 257, 265, 266.

On collecting only, *cf.* Lord Walsingham & Chambers, Amer. Nat. vi. pp. 275–280, 432, 433.

Sphingidæ.

For a list of 40 Sphingidæ occurring in the State of New York, *cf.* J. A. Lintner, Rep. N. Y. S. Cab. xxiii. pp. 172–175.

A list of the *Sphingidæ* in the Museum of the Royal Dublin Society is published by W. F. Kirby, J. R. Dubl. Soc. vi. pp. 60–62.

Macroglossa fuciformis (*scabiosæ*). On its synonymy, *cf.* Zeller, S. E. Z. 1872, pp. 49–51, who points out that *Sphinx bombyliformis*, L., was probably a very much worn *Deilephila porcellus*.

Sphinx camertus, Cram., = *Enyo lugubris*, Dru.: Wallengren, Œfv. Vet. Ak. 1871, p. 913.

Deilephila chamæneri, Harr., = *D. galii*, W. V.: Strecker, Canad. Ent. iv. p. 206.

Chærocampa elpenor. An extraordinary var. with hyaline wings (*cf.* Zool. Rec. viii. p. 367) is figured and described by Newman, Ent. vi. p. 81.

C. transfigurata, Wgr., = *Sphinx clio*, Fab., = *S. idricus*, Dru., = ? *S. medea*, Fab.: Wallengren, *l. c.* 1872, p. 50.

Pachylia lyncea, Clem., and allies: *id. l. c.* 1871, p. 913.

Sphinx pinastri. British specimens recorded by A. J. Spiller and J. Purdue, Ent. vi. pp. 114, 115, 127.

S. ligustri. On its agamogenesis, *cf.* S. Clegg, Ent. vi. pp. 221–233. (Remarks by Knaggs, Ent. Ann. 1873, p. 39.) Larva figured, with detail: Vollenhoven, Sepp's Nederl. Ins. (2) ii. p. 221, pl. xlvii. figs. 2 & 3.

Ellema harrisi, Clem. J. A. Lintner notices and figures it in all stages: *l. c.* pp. 170 & 171, pl. 8. f. 8–11. *Lapara bombycoides*, Walk., appears to be distinct both from this species and from the new *E. pineum*, Lintn.

Acherontia atropos. For a summary of published observations, with additional remarks on dissections, and a fig. of section of head, *cf.* H. N. Moseley, Nature, vi. pp. 151–153. The seat of the sound is certainly in the head. Larva figured: Vollenhoven, Sepp's Nederl. Ins. (2) ii. p. 220, pl. xlvii. fig. 1.

Smerinthus ocellatus. The larva will eat *Prunus padus*: Speyer, S. E. Z. 1872, p. 149.

S. populi. An hermaphrodite described by O. Nickerl, Verh. z.-b. Wien, xxii. p. 728. A var. of the larva recorded by G. R. Dawson, Ent. vi. p. 184.

Langia, g. n., Moore, P. Z. S. 1872, p. 567. Types *L. zenzeroides*, Kotghur, N.W. Himalayas, and *L. khasiana*, Khasia Hills: Moore, *l. c.* pp. 567 & 568, spp. nn.

New species:—

Chærocampa schencki, Möschler, S. E. Z. 1872, p. 339, Natal, Caffraria.

Pergesa olivacea, Simla, *P. castanea*, Bombay : Moore, *l. c.* p. 567.

Sphinx snelli, Weyenbergh, Ins. Foss.

Ellema pineum, J. A. Lintner, Rep. N. Y. S. Cab. xxiii. p. 169, pl. 8. figs. 12 & 13 (larva also described), Schoharie, N. Y., Canada.

Smerinthus decoratus, Moore, *l. c.* p. 568, Sikkim.

ÆGERIIDÆ.

Sesia apiformis. Larva will feed on cork, *cf.* G. H. Raynor, Ent. vi. p. 79.

Ægeria exitiosa figured by W. Saunders, Canad. Ent. iv. p. 133.

Sesia guriensis, Emich, R. Z. xxiii. p. 63, Hor. Ent. Ross. ix. p. 41, pl. 26. fig. 1, Guria, Transcaucasia ; *S. pimpliformis* (Boisd., MS.), C. Oberthur, R. Z. xxiii. p. 486, pl. 21. fig. 3, Van, Asia Minor : spp. nn.

URANIIDÆ.

Newman would unite *Urania*, *Synemon*, &c. with the butterflies : Zool. (s. s.) vii. p. 2887.

CASTNIIDÆ.

Ægiale indecisa, Butler & Druce, Cist. Ent. v. p. 116, Costa Rica.

Ægocera limbata, Möschler, S. E. Z. 1872, p. 354, Silhet.

Eusemia funebris, Darjeeling, *E. albimarginata*, Burmah : Moore, P. Z. S. 1872, p. 569.

Alypia. Stretch (Illustrations, pp. 5–16, pl. 1. figs. 1–8) enumerates 12 species found in the United States and Canada, and describes and figures *A. octomaculata*, Fabr., *A. dipsaci*, *sacramenti*, *ridingsi*, and *lorquini*, Grote, and three new species.

Eudryas. Stretch (*l. c.* pp. 145–151, pl. 7. figs. 1 & 2) figures and redescribes *E. grata*, Fabr., and *E. unio*, Hübn.

New species :—

Alypia braunani, p. 8, fig. 8, *similis*, p. 14, fig. 5, *lunata*, p. 15, fig. 6 : Stretch, *l. c.* pl. 1, California.

Eudryas brevipennis, id. *l. c.* p. 191, pl. 7. figs. 3 & 4, California.

ZYGÆNIDÆ.

Zygæna dorycnii, Ochs., is certainly the Caucasian variety of *Z. peucedani* C. Oberthur, R. Z. xxiii. p. 486.

Z. exulans, *cf.* Newman, Ent. vi. pp. 22–25. F. B. White proposes the name *subochracea* for the Scotch var., which he describes, Scot. Nat. i p. 175.

Z. filipendulæ. The larva and pupa are sometimes eaten by birds : Lawless & Newman, Ent. vi. p. 77.

Z. meliloti has occurred in Britain : J. P. Barrett, Ent. M. M. ix. p. 111. See also Tugwell, Barrett, Harpur, and Doubleday, Ent. vi. pp. 184–186, and H. G. Knaggs, Ent. Ann. 1873, p. 40.

Z. pilosellæ (*minos*, W. V.), *cf.* Zeller, S. E. Z. 1872, pp. 51 & 52.

Zygæna trifolii. On its variation in England and Belgium, *cf.* De Selys-Longchamps, Ann. E. Belg. xv. pp. 56–59 (translated, Ent. M. M. ix. p. 14).

Z. hottentota, H.-S., = *caffra*, L.; *Z. negamica*, Wlk., = *Arichalca erythropyga*, Wgr.: Wallengren, Œfv. Vet. Ak. 1872, p. 50.

Syntomis phegea has occurred near Dover: N. E. Brown, Ent. M. M. ix. p. 160; *cf.* also Knaggs, Ent. Ann. 1873, pp. 41 & 42.

S. thyretiformis, Wgr.: *cf.* Snellen, Tijdschr. Ent. (2) vii. p. 35, pl. 3. figs. 1–3.

Cosmosoma omphale, Hübn., figured and redescribed by Stretch, Illustrations, p. 153, pl. 7. fig. 5.

Desmidocnemis, g. n., Möschler, S. E. Z. 1872, p. 346. Allied to *Diptilon*. Type *D. prittwitzi*, sp. n., *id. l. c.* p. 348, Cayenne.

New species:—

Chrysostola albifrons and *splendens*, id. *l. c.* pp. 344 & 345, Cayenne.

Euchromia (Automolis) scintillans, Butler, Cist. Ent. iv. p. 87, Costa Rica.

Phalanna amœna, Möschler, *l. c.* p. 350, Silhet.

Gymnelia jansonis[*-ni*], Butler & Druce, Cist. Ent. v. p. 116, Costa Rica.

Aclytia obscura, Cayenne, *flaviventris*, Brazil: Möschler, *l. c.* pp. 348 & 349.

Charidea rufigularis, *id. l. c.* p. 349, Brazil.

Nycteolidæ.

Halias prasinana. F. B. White describes the anatomical structure by which the sound produced by this insect is caused. It appears to be analogous to the "drum" of the ♂ *Cicada*, and occupies a similar position. Scot. Nat. i. pp. 213–215.

H. quercana. Larvæ described and figured: Vollenhoven, Sepp's Nederl. Ins. (2) ii. p. 234, pl. 50. figs. 9 & 10.

H. siliquana. On its ravages in Egypt, *cf.* Bull. Soc. Ent. Fr. (5) ii. pp. lxxvii & lxxviii.

Sarothripus revayanus. Further particulars of economy: Vollenhoven, *l. c.* p. 235.

Earias fusciciliana and *maculana*, Snellen, Tijdschr. Ent. (2) vii. p. 36, Lower Guinea, spp. nn.

Lithosiidæ.

A. G. Butler (Tr. E. Soc. 1872, pp. 49–58) catalogues the described species of *Pericopides* of the genera *Esthema*, *Eucyane*, *Composia*, *Phaloesia*, *Stenele*, *Hyalurga*, *Gyara*, *Hyelosia*, *Phaloe*, and *Pericopis*. *Pericopis disjuncta*, Walk., = *P. bivittata*, Walk. *Daretis marginalis*, Walk., is a *Pericopis*, and perhaps = *P. dissimulans*, Walk., ♀. *P. lunifera*, Butl., = *turbida*, Hübn. The genus *Gyara* is hardly distinct from *Hyalurga*.

Butler also (*l. c.* pp. 255–257) reviews the species described by Boisduval from Guatemala (*cf.* Zool. Rec. vii. pp. 403 & 404) as follows:—*Calepidos celina* = *Eucyane pylotis*; *C. anacharsis* may be an *Esthema*; *Chetone lorzæ* is a *Phaloe*, near *P. erruenta*; *C. phœba* probably = *Pericopis isse*, var.; *C. aorsa* probably = *P. bivittata*; *C. iscariotes*, *felderi*, and *helicon*[*io*]*ides* are probably new.

Ctenucha. Stretch (Illustrations, pp. 23–32, pl. 1. f. 10–15) enumerates 8 species found in the United States, and describes and figures *C. virginica*, Charp., *C. cressonana* and *ochriscapus*, Grote, *C. multifaria* and *venosa*, Walk., and one new species.

Stretch (*l. c.*) figures and redescribes (sometimes with notices of transformations) *Scepsis fulvicollis*, Hübn. (= *Glaucopis semidiaphana*, Morr., and *Scepsis packardi*, Grote); *Acoloithus falsarius*, Clem. (figured as *A. americanus*, Cl.); *Harrisina americana*, Boisd.; *Lycomorpha pholus*, Dru.; *Anatolmis grotii*, Pack.; *Pyromorpha dimidiata*, H.-S.; *Gnophala vermiculata* and *hopfferi* (? = *Glaucopis latipennis*, Boisd.), Grote; *Ecpantheria scribonia*, Stoll; *Psychomorpha epimenis*, Dru.; *Phryganidia californica*, Grote, apparently intermediate between *Procris* and *Ctenucha* [?]; *Hypoprepia fucosa*, Hübn. (= *miniata*, Kirb., *vittata*, Harr., and *tricolor*, Fitch); *Lithosia argillacea*, Pack.; *L. aphalica*, Grote, and *L. casta*, Sanb.; *Crambidia pallida*, Pack.; *Eustixis subfervens*, Walk.; *Cydosia nobilitella*, Cram. ?, from Texas (*C. imitella* proposed for this species, if distinct from Cramer's), and *C. aurivitta*, Gr. & R.; *Œta aurea*, Fitch; *Cisthene faustinula* and *nexa* (= *C. grisea*, Pack.), Boisd.; *C. subjecta*, Walk., and *C. unifascia*, G. & R.; *Clemensia albata* and *umbrata*, Pack.; *Utetheisa bella*, L.; *U. speciosa*, Walk.; *U. ornatrix*, L.; and a form intermediate between the two latter (the 3 forms are perhaps not truly distinct) and *Euphanessa mendica*, Walk. (should perhaps be referred to the *Geometræ*, according to some observations made by W. Saunders on the newly-hatched larva).

Leptosoma insulare. Larva from Madagascar described by Vinson & Guénée, 'Voyage' &c., Annexe F, p. 42.

Tumida sagenaria, Wgr., = *Barsine natalensis*, Walk.: Wallengren, Œfv. Vet. Ak. 1872, p. 50.

On the earlier stages of *Nudaria senex* and *mundana*, *Setina irrorella*, *Lithosia mesomella*, *muscerda*, and *complana*, *cf.* Buckler & Hellins, Ent. M. M. viii. pp. 169–175.

Nudaria senex, Hübn.: F. J. M. Heylaerts, fils, Tijdschr. Ent. (2) vii. p. 121.

Nola strigula. Larva described by Buckler, Ent. M. M. ix. pp. 15 & 16.

N. malana (*Brachytænia malana*, Fitch) redescribed by Zeller, Verh. z.-b. Wien, xxii. p. 454. On *B. triquetana*, Fitch, *cf.* Zeller, *l. c.* p. 457.

Calpenia, g. n. (*Hypsinæ*), Moore, P. Z. S. 1872, p. 571. Type *C. saundersi*, sp. n., *l. c.* pl. 33. fig. 1, India.

New species:—

Ctenucha brunnea, Stretch, Illustrations, p. 30, pl. 1. fig. 11, California.

Harrisina texana, *id. l. c.* p. 181, pl. 8. fig. 1, Texas.

Lysomorpha miniata, S. California, *L. palmeri*, Arizona: A. S. Packard, Rep. Peab. Ac. iv. p. 84.

Euagra quadrimaculata, Möschler, S. E. Z. 1872, p. 349, Cayenne.

Dioptis ithomeina and *noctiluces*, Butler, Cist. Ent. iv. pp. 87 & 88, Costa Rica.

Esthema confluens, *id.* Tr. E. Soc. 1872, p. 49, Villa Nova.

Pericopis noctuites, Minas Geraes ?, *rubripicta*, Bogota, and *fenestrata* (= *P. thetis*, local form), San Geronimo, Vera Paz: Butler, *l. c.* p. 50; *P. irenides* and *leonina*, Butler, Cist. Ent. iv. pp. 88 & 89, Costa Rica.

Milionia zonea, N.W. Bengal, *lativitta*, Sikkim: Moore, P. Z. S. 1872, pp. 569 & 570.

Chrysauge lutescens, Butler, *l. c.* p. 88, Costa Rica.

Nelo chrysomela, Butler & Druce, Cist. Ent. v. p. 117, Costa Rica.

Emplocia primulina, iid. *l. c.* p. 118, Costa Rica.

Heterusia fasciata, *signata*, *trimacula*, *flavimaculata*, and *octopunctata*, Möschler, *l. c.* pp. 340–344, Silhet.

Chelura glacialis, Moore, *l. c.* p. 570, Darjeeling.

Neochera tortuosa, id. *l. c.* p. 570, pl. 33. fig. 2, India.

Bizone hova, Guénée, in Vinson's 'Voyage' &c., Annexe F, p. 42, Madagascar; *B. gazella*, Moore, *l. c.* p. 572, pl. 33. fig. 4, Masuri, N.W. Himalayas.

Gnophria quadrimaculata and *G.* (*Œnistis*) *strigata*, Möschler, *l. c.* pp. 352 & 353, Silhet.

Lithosia colon, Silhet, *natalica*, Natal: Möschler, *l. c.* pp. 353 & 354. *L. distorta*, Sikkim, *nigrifrons*, N. India: Moore, *l. c.* p. 572.

Cisthene grisea [= *C. nexa*, Boisd., *vide antè*], A. S. Packard, Rep. Peab. Ac. iv. p. 84, California.

Clemensia umbrata, A. S. Packard, *l. c.* p. 85, California.

Nola nigrifasciata, p. 454, pl. 2. fig. 1, Massachusetts, *minuscula*, p. 455, *melanopa*, p. 458, pl. 2. fig. 2, *strictalis*, p. 459, pl. 2. fig. 3, Texas: Zeller, Verh. z.-b. Wien, xxii.

Arctiidæ.

Arctiina. Under this heading Snellen includes as subfamilies *Agaristina*, *Syntomina*, and *Cymbidæ*. Tijdschr. Ent. (2) vii. p. 34.

Stretch (Illustrations) figures and redescribes, sometimes with notices of transformations, *Euprepia americana*, Harr.; *Epicallia virginalis*, Boisd., with varr. *guttata*, Boisd., and *ochracea*, Stretch; *Arctia antholea* and *dahurica* (? = *complicata*, Walk.), Boisd.; *A. achaia*, Grote, and *A. virgo*, L.; *Seiarctia clio*, Pack.; *Leptarctia lena* and *decia*, Boisd.; *Callimorpha lecontei*, Boisd.; *C. interrupto-marginata*, De Beauv. and *C. clymene*, Esp.; *Spilosoma virginica*, F., and *S. vestalis*, Pack.; *Leucarctia aurea*, Dru. (= *L. californica*, Pack.); *Halesidota edwardsi*, Pack. (= *H. translucida*, Walk., and *Phægoptera quercus*, Boisd.); *H. agassizi*, Pack. (= *H. californica* and *angulifera*, Walk., and *P. salicis*, Boisd.); *H. argentata*, Pack.; *H. tessellaris*, Smith, and *H. caryæ*, Harr.; and *Arachnis picta* (? = *A. aulæa*, Hübn., and *Ecpantheria incarnata*, Walk.).

Chelonia hebe. On the habits of the larva, *cf.* Ragonot and Fallou, Bull. Soc. Ent. Fr. (5) ii. pp. xxxviii & xxxix.

C. caja, var., described by E. F. Bisshopp, Ent. vi. p. 183.

Arctia cervini, Fall. Frey describes var. *knatecki* from the Valais, MT. Schw. Ent. Ges. iii. p. 479.

Callimorpha hera. Figured and all stages described by E. Newman, Ent. vi. pp. 33–36. On yellow and intermediate varr. of this and *C. dominula*, *cf.* Fallou and Oberthur, Pet. Nouv. 1872, p. 236; Ann. E. Belg. xv. Bull. pp. 5 & 6.

C. fulvicosta, Clem. Habits, *cf.* Le Baron, Rep. Ins. Illin. i. p. 47 (Rec. Am. Ent. 1871, p. 18).

Nemeophila petrosa, Walk., *cf.* A. S. Packard, Rep. Peab. Ac. iv. p. 85. *Platarctia scudderi*, Pack., is an allied *Nemeophila*.

Leucarctia uceæa, Sm. *L. californica*, Pack., is the same as this: Rep. Peab. Ac. iv. p. 86.

Arctia isabella, Smith. Noticed and figured in all stages by Riley, Rep. Ins. Miss iv. pp. 143 & 144.

Pyrrharctia californica? = *P. isabella*. Packard, Rep. Peab. Ac. iv. p. 86.

Senura alba, Wgr., = *Aloa simplex*, Walk.; *Spilosoma strigatum*, Wgr., = *S. linea* and *S. dorsale*, Walk.: Wallengren, Œfv. Vet. Ak. 1872, pp. 50 & 51.

Spilosoma sordidum. A ♂ with ♀ coloration refused to pair. Guénée, Pet. Nouv. 1872, p. 212.

Ecpantheria scribonia, Stoll. Both sexes and larva figured, and the latter described by Riley, Rep. Ins. Mo. iv. pp. 141–143.

Euchætes egle. The supposed grey and white varr. of the ♀ never occur in the same locality. Strecker, Lepidoptera, p. 7.

Leptarctia, g. n., Stretch, Illustrations, p. 118. Allied to *Nemeophila* and *Platarctia*. To include *Lithosia lena*, Boisd. (of which *L. adusta*, Boisd., and probably *Platarctia modesta*, Pack., are varr.), *L. decia*, Boisd., and one new species.

Ko[Co-]diosoma, g. n., *id. l. c.* p. 67. Allied to *Phragmatobia*. Types *K.* [*C.*] *fulva*, *l. c.* pl. 2. fig. 7, and *nigra*, p. 68, fig. 8 (spp. nn.), California; *tricolor*, *l. c.* fig. 5, and *eavesi*, p. 69, fig. 6 (spp. nn.) from Nevada, are included provisionally in the genus.

New species :—

Arctia behri, p. 75, pl. 3. figs. 11 & 12; *A. bolanderi*, p. 76, fig. 13; *A. edwardsi*, p. 71, fig. 9, California, *id. l. c.*; *A. vittata*, Möschler, S. E. Z. 1872, p. 351, Melbourne.

Leptarctia dimidiata, Stretch, *l. c.* p. 123, pl. 5. fig. 7–10, California.

Leucarctia permaculata, A. S. Packard, Rep. Peab. Ac. iv. p. 86, S. California.

Halesidota sobrina, Stretch, *l. c.* p. 135, pl. 6. fig. 10, California.

Estigmene strigosa, Möschler, *l. c.* p. 355, Natal.

Creatonotus rubricosta, Moore, P. Z. S. 1872, p. 573. Maupuri, N.W. India, Bombay.

Hypercompa regalis, Moore, *l. c.* p. 575, pl. 33. fig. 7, N. India.

Spilosoma dentilinea, Sikkim, p. 573, *brunneum*, Bombay, *todara*, Coonoor, Nilghiris, p. 574, Moore, *l. c.*; *S. melanostigma*, Erschoff, Hor. Ent. Ross. viii. p. 316, Turan; *S. latipenne*, Stretch, *l. c.* p. 123, pl. 6. fig. 5, United States.

Cycnia natalica, Möschler, *l. c.* p. 356, Natal.

Aloa nigricans and *sipahi*, Moore, *l. c.* pp. 572 & 573, Bombay, Deccan, &c..

Agrisius fuliginosus, id. *l. c.* p. 571, pl. 33. fig. 3, India.

LIPARIDÆ.

Creagra aliena, Wgr., = *Liparis dealbata*, H.-S.; *C. prolixa*, Wgr., = *L. adversa*, H.-S.; *Porthesia cateja*, Wgr., = *Liparis crocata*, Bd.; *Homæomeria flavicapilla*, Wgr., = *Stilpnotia luteipes*, Walk.; *Phiala xanthosoma*, Wgr., =

Heteromorpha costipuncta, H.-S., var.?; *Striphnopteryx crepax*, Wgr.,=*Jana tantalus*, H.-S. Wallengren, Œfv. Vet. Ak. 1872, pp. 50 & 51.

Porthesia auriflua and *chrysorrhœa*. On the habits of their larvæ and the mischief caused by them, *cf.* L. Léon and E. Lefevre, Pet. Nouv. 1872, pp. 209, 243.

Orgyia leucostigma, Smith. Notes on larva, *cf.* J. A. Lintner, Rep. N. York Cab. xxiii. p. 189, note.

O. leucostigma, Sm. & Abb., and *Hyphantria textor*, Harr. On habits, *cf.* Le Baron, Rep. Ins. Illin. i. p. 13 (Rec. Am. Ent. 1871, p. 18).

O. ericæ, Germ. Transformations and habits: Vollenhoven, Sepp's Nederl. Ins. (2) ii. pp. 202–207, pl. xliv.

Ocneria dispar. Hermaphrodite described by O. Nickerl, Verh. z.-b. Wien, xxii. p. 729.

Leucoma salicis. On its parthenogenesis, *cf.* Breyer, Ann. E. Belg. xv. p. 44; on the habits of the larva, *cf.* G. F. Matthew, Ent. M. M. viii. pp. 206, 207.

Liparis rufescens, Brullé. A larva from Teneriffe, supposed to belong to this species, described by D. L. v. Heyden, Ber. senck. Ges. 1871–1872, p. 88.

L. monacha, var., described and figured by E. Newman, Ent. vi. pp. 145, 146.

New species:—

Orgyia mixta, Snellen, Tijdschr. Ent. (2) vii. p. 38, pl. 3. figs. 6 & 7, Lower Guinea.

Procodeca testacea, Moore, P. Z. S. 1872, p. 574, Bengal.

Deroca maculata, Moore, *l. c.* p. 575, Masuri, N.W. Himalayas.

Lælia subrufa, p. 39, *L. ochracea*, p. 39, pl. 3. fig. 8, Snellen, *l. c.*, Lower Guinea.

Leucoma (?) *margaritacea*[*-eum*], Möschler, S. E. Z. 1872, p. 357, Paramaribo, Surinam; *L. flavisulphurea*[*-eum*], Erschoff, Hor. Ent. Ross. viii. p. 316, Samarcand.

Euproctis æthiopica, Snellen, *l. c.* p. 37, pl. 3. figs. 4 & 5, Lower Guinea.

Naxa puncticollis, Moore, *l. c.* p. 575, Nilghiris.

Psychidæ.

Psyche vesubiella, sp. n., Millière, Pet. Nouv. 1872, pp. 255 & 256, Alpes Maritimes.

Notodontidæ.

Cnethocampa processionea. On habits of larva, *cf.* Heywood and Clifford, Ent. vi. pp. 39, 40, 60, 61.

Pygæra bucephala. Larva infested by a large (Dipterous?) larva, *cf.* Butler, P. E. Soc. 1872, p. 5.

New genera and species:—

Tarsolepis, g. n., Butler, Ann. N. H. (4) x. p. 125. Type *P. remicauda* sp. n., *id. l. c.* pl. 8, Java. On its supposed identity with *Crinodes sommeri*, Hübn., *cf.* Ritsema & Butler, *l. c.* pp. 228, 274, 446; Ent. M. M. ix. pp. 94 & 95, 111 & 112, 164–166. [*Cf.* also *Bombycidæ*.]

Lomatosticha, g. n., Möschler, S. E. Z. 1872, p. 358. Type *L. nigristriata*, sp. n., *id. l. c.* p. 359, Melbourne.

Wærdenia, g. n., Snellen, Tijdschr. Ent. (2) vii. p. 40. Allied to *Demas* and *Diloba*. Type *W. weyenberghi*, sp. n., p. 43, pl. 3. figs. 9–12, Lower Guinea.

Harpyia æruginosa, H. Christoph, Hor. Ent. Ross. ix. p. 4, pl. 1. fig. 1, Sarepta.

Notodonta californica, Stretch, Illustrations, p. 116, pl. 4. fig. 5, California.

Phalera woerdeni, Snellen, *l. c.* p. 45, pl. 4. figs. 1–3, Lower Guinea.

Asbolia micans, Möschler, *l. c.* p. 359, Paramaraibo, Surinam.

Rhinogyne australasiæ, id. *l. c.* p. 360, Melbourne.

Limacodidæ.

Limacodes testudo, var., described by E. F. Bisshopp, Ent. vi. p. 183.

Euphaya (H.-S., plate), Guénée, in Vinson's 'Voyage' &c. Annexe F, p. 40. Allied to *Sibine* and *Nyssia*, but larva spined (eaten by natives of Madagascar). Type *E. floccifera*, H.-S.

Drepanulidæ.

Platypteryx falcula. On breeding, *cf.* G. H. Raynor, Ent. vi. pp. 5, 6.

P. falcataria and *curvatula*. Larvæ noticed by F. J. M. Heylaerts, fils, Tijdschr. Ent. (2) vii. p. 123.

P. cultraria. Speyer describes var. *æstiva*, S. E. Z. 1872, p. 169.

Apona, Walk. Recharacterized, and both sexes of *A. pallida*, Walk., redescribed by Moore, P. Z. S. 1872, p. 579, from Sikkim.

Alompra, g. n., Moore, *l. c.* p. 579. Allied to *Apona*. Type *A. ferruginea*, sp. n., *id. l. c.* p. 580, pl. 33. fig. 8, Darjeeling.

New species :—

Apona plumosa, Moore, *l. c.* p. 579, Kurnool, Nilghiris.

Drepana siculifer, A. S. Packard, Rep. Peab. Ac. iv. p. 87; Stretch, Illustrations, p. 110, pl. 4. fig. 11, California.

Saturniidæ.

A list of the *Saturniidæ* in the Museum of the Royal Dublin Society is published by W. F. Kirby, J. R. Dubl. Soc. vi. pp. 201–204. Vars. of *Samia cecropia* and *Telea paphia* are mentioned, and remarks made on *Antheræa mylitta*, *pernii*, *yamamai*, &c.

J. P. Maassen, with the co-editorship of G. W. Weymer, has published a second part of his 'Beiträge zur Schmetterlingskunde' (Elberfeld, 1872), with 10 plain plates, entirely devoted to the *Saturniidæ*. The following corrections are made to pt. 1 (*cf.* Zool. Rec. vi. pp. 335, 392) :—*Rhescyntis pandora*, Klug., = *R. meander* ♀, Walk.; *Eudæmonia phœnix*, Deyr., = *E. semiramus*, Cram.; *Actias cometes*, Maass., = *A. cometes*, Guén. They figure *Actias dictynna*, Walk., fig. 15; *Brahmæa whitii*, Butl., fig. 17 [= *B. hearseyi*, White, P. E. Soc. (3) i. p. 26]; *Bunæa deyrollii*, Thoms., figs. 18 & 19; *Rinaca zuleica*, Hope, fig. 24; *Actias mænas*, Doubl., figs. 25 and 26.

Attacus atlas. On rearing in France, M. Girard, Bull. Soc. Ent. Fr. (5) ii. pp. lxxxii & lxxxiii.

Attacus cynthia. Report on its rearing in France by Givelet and Usèbe, *cf.* Guérin-Méneville, R. Z. xxiii. pp. 189–192. On its parthenogenesis, *cf.* Girard, Bull. Soc. Ent. Fr. (5) ii. p. xii.

Saturnia pyri and *cynthia.* On the structure of their larvæ, *cf.* Goossens, Bull. Soc. Ent. Fr. (5) ii. p. lxiv.

Platysamia cecropia and *Telea polyphemus.* On their "assembling," *cf.* R. V. Rogers, Can. Ent. iv. pp. 138 & 139.

Attacus cecropia. On its emergence from its cocoon, *cf.* B. Clemens, Tin. of N. Amer. pp. 6 & 7.

Samia columbia, Smith, is probably either a variety of *S. cecropia* or a hybrid between this and *S. promethea.* Riley, Rep. Ins. Mo. iv. p. 107.

On rearing *Saturnia yamamai* and *mylitta* in Switzerland, *cf.* C. Henzi, Verh. schw. Ges. liii. pp. 60–64; MT. Ges. Bern, 1869–1870, nos. 684–711, pp. 206–217; 1870–1871, nos. 711–744, pp. iii–viii. On rearing *S. yamamai* in Italy, *cf.* Tacchetti, Bull. Ent. Ital. iv. pp. 381–383: at Münster in Westphalia, *cf.* Verh. Ver. Rheinl. CB. xxviii. pp. 59, 60; VB. westph. rheinl. Ver. Bien. Seidenz. 1870, nos. 1 & 9.

Aglia tau, L. An hermaphrodite noticed by Dietze, S. E. Z. 1872, pp. 331–333.

Hemileuca maia, Drury. Earlier stages, development, habits, &c. minutely described, and imago (♂), pupa, and egg-belt figured by J. A. Lintner, Rep. N. Y. S. Cab. xxiii. pp. 137–153, pl. 8. f. 1–3.

New genera and species:—

Eulcucophæus, g. n., A. S. Packard, Rep. Peab. Ac. iv. p. 88. Allied to *Hemileuca.* Type *E. tricolor,* sp. n., p. 89; Stretch, Illustrations, p. 143, pl. 6. figs. 3 & 4, New Mexico.

Rhodia, g. n., Moore, P. Z. S. 1872, p. 578. Type *R. newara,* sp. n., *id. l. c.,* Nepal.

Attacus cæsar, Maassen & Weymer, *l. c.* figs. 22 & 23, Mindanao, Bohol.

Antheræa simplicia, iid. *l. c.* p. 20, E. Indies; *A. gueinzii,* Staudinger, S. E. Z. 1872, p. 120, Natal.

Platysamia gloveri, Strecker, Lepidoptera, p. 5, pl. 1, Arizona.

Saturnia dyops, Maassen & Weymer, *l. c.* fig. 21, Natal.

Eudæmonia derceto, iid. *l. c.* figs. 13 & 14, New Friburg.

Actias diana, Java, fig. 12, *astarte,* E. Indies, fig. 16 (=*A. selene,* var. ?), *iid. l. c.*; *A. cometes* (Boisd. MS.), Guénée, in Vinson's 'Voyage,' &c., Annexe F, p. 46, pl. 7, Madagascar; *A. rossi,* Ross [!], Cat. Lep. Canada, p. 5, note, Toronto.

Hyperchiria euryopa, Rio, *maasseni,* Cayenne, Möschler, S. E. Z. 1872, p. 361.

Hemileuca nevadensis, Stretch, *l. c.* p. 108, pl. 4. fig. 10, Nevada; *H. juno,* Packard, *l. c.* p. 87, Arizona and Sonera.

Caligula cachara, Moore, *l. c.* p. 578, N. Cachar.

Neoris shadulla, id. *l. c.* p. 577, Shadulla, near Yarkand.

Bombycidæ.

Luppi, G. Dictionnaire de Séricologie, comprenant l'art de produire la soie et de l'apprêter. Synonymie en cinq langues, texte en français. Paris, 1872, 8vo, pp. 530.

Noticed R. Z. xxiii. p. 366.

Clisiocampa americana and *sylvatica*. Larvæ figured by W. Saunders, Can. Ent. iv. p. 134. On destructive swarms of the larva of the latter, *cf.* Bell, Canad. Ent. iv. p. 199.

Lasiocampa potatoria. Larva hibernates full-fed in Scotland, like that of *Bombyx rubi*: J. Boswell Syme, Scot. Natii. p. 176.

Gastropacha cratægi and *quercus*. Hermaphrodites described by O. Nickerl, Verh. z-b. Wien, xxii. p. 731.

Bombyx rubi and *quercus*. On hibernation of larvæ, *cf.* J. R. S. Clifford and G. B. Corbin, Ent. vi. pp. 15, 83, 84.

B. quercus. Guénée describes and figures an hermaphrodite, Mém. Soc. Phys. Genève, xxi. pp. 418–422, fig. 8.

On double cocoons in *B. mori* and *Eriogaster lanestris*, *cf.* P. E. Soc. 1872, p. 5.

Adelocephalides. Boisduval has published a review of the species of this new group, which is closely allied to the *Ceratocampides*. Ann. E. Belg. xv. pp. 79–96. Known species as well as new are described.

Adelocephala pellucida, Smith, probably = *Phalæna virginiensis*, Drury. Boisduval, Ann. Ent. Belg. xv. p. 87.

A. senatoria, Smith. Described (with the other known species of the genus) and larva figured by Boisduval, Ann. E. Belg. xv. p. 87, pl. 3. fig. 5.

Thiala xanthosoma, Wgr.: *cf.* Snellen, Tijdschr. Ent. (2) vii. p. 47, pl. 4. figs. 4–6.

Bombyx mori. P. Eymard ("Rapport de la Commission des Soies sur ses operations de l'année, 1868," Ann. Soc. L. Lyon (4), i. pp. 87–119) publishes a number of reports and statistics on sericiculture which hardly admit of abridgment.

Pasteur's work on the diseases of the silkworm (*cf.* Zool. Rec. vii. p. 309) is reviewed at length by Közli, Term. Közl. 1871, pp. 191–195.

On a dipterous parasite infesting the silkworm, *cf.* E. Cornalia, Rend. Ist. Lomb. (2) iii. pp. 561 & 562.

B. mori. On its parthenogenesis, &c., *cf.* Bull. Ent. Ital. iv. pp. 276–278, 291–298, 302, 303, 384–388. On its most suitable food, *cf.* T. C. Batchelor, Tr. N. Y. Inst. iv. pp. 424–427.

On the progress of sericiculture throughout the world, *cf.* Guérin-Méneville, R. Z. xxiii. pp. 27–32, 123–127.

On sericiculture in Mauritius &c., *cf.* H. C. Descroizilles, P. R. Soc. Maur. (2) vi. pp. 50–56; see also pp. 157–163, 177, 178.

For a detailed paper on sericiculture, with notices and figures of the most important of the large silk-producing *Bombycidæ* and *Saturniidæ* (American and imported), *cf.* Riley, Rep. Ins. Mo. iv. pp. 72–138.

New genera and species:—

Napta, g. n., Guénée, Vinson's 'Voyage' &c. Annexe F, p. 43. Allied to *Lasiocampa*. Type *N. serratilinea*, sp. n., *id. l. c.* Madagascar.

Gloveria, g. n., A. S. Packard, Rep. Peab. Ac. iv. p. 89. Allied to *Lasiocampa* (*Otus*). Type *G. arizonensis*, sp. n., *id. l. c.* p. 90, Arizona and New Mexico.

Norasuma, g. n., Moore, P. Z. S. 1872, p. 575. Allied to *Bombyx* and *Theophila*. Type *N. javanica*, sp. n., *id. l. c.* p. 576, pl. 33. fig. 6, Java.

Ceroderes, g. n., Boisd. Ann. E. Belg. xv. p. 81. Intermediate between

the *Ceratocampides* and *Adelocephalides*. Type *Phalæna medina*, Cr. (described).

Othorene, g. n., Boisduval, Ann. E. Belg. xv. p. 82. Type *Adelocephala cadmus* (Boisd.), H.-S. (described, p. 83).

Astylis, g. n., *id. l. c.* p. 94. To contain *Phalæna bellatrix*, Cr., and *Crino beseckii* and *sommeri*, Hübn. [*vide* also *Notodontidæ*].

Gastropacha hæmat[*o*]*idea*, Snellen, Tijdschr. Ent. (2) vii. p. 44, pl. 3. figs. 13 & 14, Lower Guinea; *G. roseata*, Stretch, Illustrations, pl. 4. fig. 12 (subsequently described as *G. mildi*, p. 113), California; *G. californica*, Packard, *l. c.* p. 91, S. California.

Borocera cajani, Vinson (figured, with descriptions of transformations and remarks on its sericicultural importance), 'Voyage' &c. pp. 562–568, pl. 4. figs. 1 & 2; "Le ver à soie de Madagascar, ou ver à soie de l'Ambrevate" (pupæ eaten by the natives, *ibid.* p. 309). Additions by E. Blanchard, *ibid.* pp. 568–572. ? = *madagascariensis*, Bdv.: Guénée, *ibid.* Annexe F, pp. 45 & 46.

Lasiocampa tamatavæ, Guénée, *l. c.* p. 44, Madagascar.

Othorene jason, Mexico, p. 83, *fallax*, pl. 3. fig. 3, Brazil, *mexicana*, Oaxaca, *wardi*, Brazil, pl. 3. fig. 2, p. 84: Boisduval, Ann. E. Belg. xv.

Adelocephala leucostigma, Guatemala and Oaxaca, p. 85, *tristigma*, Brazil, pl. 3. fig. 4, p. 86, *leucantha*, p. 89, Brazil, *crocata*, Brazil (?), *argyracantha*, New Friburg, p. 90, *erubescens*, Brazil, p. 91, *isias*, p. 92, Mexico, *dissimilis*, *ruspa*, pl. 3. fig. 1, Oaxaca, p. 93: Boisduval, *l. c.*

Theophila mandarina, sp. n., Moore, *l. c.* p. 576, pl. 33. fig. 5, Shanghai.

Duduza sphingiformis, sp. n., *id. l. c.* p. 577, pl. 34. fig. 1, Sikkim.

Hepialidæ.

Sthenopis behrensi and *montana*, Stretch, Illustrations, p. 105, pl. 4. figs. 6 & 7, California: spp. nn.

Noctuidæ.

Vollenhoven, Sepp's Nederl. Ins. (2) ii., gives supplementary observations to his former accounts in the same work, on various (figured) stages of the following species:—*Hadena protea*, p. 222, pl. xlvii. figs. 4–6, egg and larva; *H. nebulosa*, p. 225, pl. xlviii. figs. 1–3, larva; *Luperina pinastri* and *Orthosia stabilis*, p. 226, pl. xlviii. figs. 4 & 5, eggs; *Cymatophora flavicornis*, p. 227, pl. xlviii. figs. 10–12, eggs and detail of larva; *Heliophobus popularis*, p. 231, pl. xlix. figs. 11–13, egg; *Cucullia scrophulariæ*, economy, p. 235; *Herminia barbalis*, ibid. pl. 50. fig. 11, larva and food-plant.

A list of 244 *Noctuæ* (exclusive of varieties) occurring in the northern Hartz Mountains is given by W. Henacker, B. E. Z. 1872, pp. 192, 233–237, pl. 6 (topographical).

On very young larvæ of *Noctuæ*, with a figure of that of *Pachetra leucophæa*, *cf.* Bull. Soc. Ent. Fr. (5) ii. pp. lvi–lviii.

Captures of *Noctuæ* in Morayshire by G. Norman, Ent. M. M. viii. pp. 210, 211, ix. pp. 141–143.

Acronycta occidentalis, Grote. W. Saunders describes the larva, and concludes that the species is identical with *A. psi*. Canad. Ent. iv. pp. 49–52.

A. leporina. A specimen combining coloration of type and var. *bradyporina*: J. Bond, P. E. Soc. 1872, p. 10.

A. superans, Guén. Larva described by W. Le Baron, Rep. Ins Illin. i. p. 52 (Rec. Am. Ent. 1871, p. 20).

Leucania straminea. Larva described by Buckler, Ent. M. M. viii. p. 248.

Xylophasia zollikoferi. A very pale var. from Inverarie described, F. B. White, Scot. Nat. i. pp. 267, 268. The species is new to Scotland.

Hadena hepatica. Larva described by Rössler, S. E. Z. 1872, pp. 310 & 311.

Xylomiges conspicillaris. On its variation, *cf.* H. W. Marsden and T. Goodyear, Ent. vi. p. 130.

Cerigo cytherea. Larva described by E. Newman, Ent. vi. pp. 28, 29.

C. amathusia, Rambur, noticed and figured by P. Mabille, Ann. Soc. Ent. Fr. (5) ii. p. 500, pl. 15. fig. 8.

Crymodes exulis. On its habits in Iceland, *cf.* W. D. Robinson, Scot. Nat. i. p. 266.

Mamestra persicariæ. On habits of larva, *cf.* B. Lockyer, Ent. vi. pp. 198 & 199.

Apamea unanimis. Larva described by Buckler, *l. c.* pp. 207 & 208.

A. oculea. Larva described by G. T. Porritt, Ent. vi. p. 125.

Caradrina grisea, Eversm., ? = *petræa*, Tengstr., but is distinct from 4-*punctata*, F. (*cubicularis*, W. V.): Keferstein, S. E. Z. 1872, p. 362.

Agrotis cursoria. Larva described by Buckler, *l. c.* ix. pp. 14 & 15.

A. porphyrea, W. V. All stages and economy described and figured in detail, with food-plant and dipterous parasite: De Roo van Westmaas, in Vollenhoven's continuation of Sepp's Nederl. Ins. (2) ii. pp. 191–195, pl. xlii.

A. helvetina, Boisd., has occurred in Britain, and is redescribed by Knaggs, Ent. M. M. viii. p. 182.

A. spinifera has occurred in the Isle of Man: Ent. vi. pp. 124 & 125.

A. segetum and *exclamationis.* On the mischief caused by their larvæ in France, *cf.* Girard, Bull. Soc. Ent. Fr. (5) ii. pp. lxii & lxiii.

Triphæna subsequa. Larva described by Buckler, *l. c.* ix. pp. 56–59.

Noctua triangulum, brunnea, and *festiva.* Larvæ described by B. Lockyer, *l. c.* pp. 162–166.

N. ditrapezium new to Scotland: F. B. White, *l. c.* p. 267.

Xanthia citrago. Larva described by G. T. Porritt, *l. c.* pp. 257 & 258.

Cirrhædia [*Cirrhoidia*] *xerampelina.* Var. described by W. Prest, Ent. vi. p. 241.

Tæniocampa cruda. Larva described by G. T. Porritt, *l. c.* pp. 138 & 139.

T. opima. Larva described by E. Newman, *l. c.* pp. 167 & 168.

T. rubricosa. Larva found feeding on seed-vessels of wild hyacinth: A. G. Moore, Zool. s. s. vii. p. 3027.

Anchocelis litura. Larva described by Buckler, *l. c.* pp. 39–41.

A. rufina. Larva described by Newman, *l. c.* pp. 126 & 127.

Euperia fulvago. A var. described by H. Bartlett, Ent. M. M. viii. pp. 187 & 188.

Dianthœcia cæsia. Larva described by Buckler, *l. c.* pp. 64 & 65.

Cucullia umbratica has occurred on an island in the middle of Derwent-

water, half a mile from any point of the shore where *Habenaria chloantha* (butterfly-orchis) grows, with pollen of this plant sticking to its eyes: W. C. Marshall, Nature, vi. p. 393.

Cucullia intermedia, Speyer. On this species, *cf.* J. A. Lintner, Rep. N. York Cab. xxiii. pp. 213–216. The imago, pupa-case, and larva are figured, pl. 8. figs. 5–7 (*C. umbratica*, fig. 4). Speyer's original paper (S. E. Z. 1870, pp. 400–406) is translated by E. L. Graef, Rep. &c. *l. c.* pp. 217–222.

Cloantha solidaginis. Larva described by G. T. Porritt, Ent. M. M. ix. p. 92.

Cosmophila auraginioides, Guén.: Snellen, Tijdschr. Ent. (2) vii. p. 60, pl. 5. fig. 6.

Brephos notha. Larva described by Buckler, *l. c.* pp. 41 & 42.

Catocala. For a list of the N.-American species, *cf.* A. R. Grote, Canad. Ent. iv. pp. 164–167; and for descriptions, *id.* Tr. Am. Ent. Soc. iv. pp. 1–20. *C. neogama*, Guén., *nec* Smith, is renamed *communis*, p. 9.

Plusia gamma. Large flight observed at sea, 20 miles off Oporto: W. H. Tugwell, Ent. vi. p. 80.

Gonoptera libatrix. Larva described by J. A. Lintner, Rep. N. York Cab. xxiii. p. 195, note.

Amphipyra pyramideoides, Guén. Habits noticed by W. Le Baron, *l. c.* p. 56 (Rec. Am. Ent. 1871, p. 20).

Erebus odora, L. On a var. from St. Bartholomew, *cf.* Wallengren, Œfv. Vet. Ak. 1871, p. 918.

E. marquesi, Philippi, = *odora*, L.: Weymer & Dohrn, S. E. Z. 1872, p. 363.

Ophiodes lunaris new to Scotland, but supposed to be imported: J. Stewart, Scot. Nat. i. p. 215.

Trigonodes hippasia, Cr.: Snellen, Tijdschr. Ent. (2) vii. p. 61.

Remigia frugalis, F. (?): *id. l. c.* p. 64, pl. 5. fig. 7.

Craniophora, g. n., *id.* Vlinders &c., p. 262. Type *Acronycta ligustri*, auctt.

Spudæa, g. n., *id. l. c.* p. 289. Between *Orthosia* and *Orrhodia.* Type *Noctua ruticilla*, Esp.

Marasmalus, g. n., Grote, Tr. Am. Ent. Soc. iv. p. 89. Allied to *Eurhipia.* Type *M. ventilator*, sp. n., *id. l. c.*, New York, Massachusetts.

Pleonectyptera, g. n., *id. l. c.* p. 23. Allied to *Catocala.* *Heliothis pyralis*, Hübn. (redescribed, *l. c.*), and *P. geometralis* and *phalænalis*, id. *l. c.* p. 24, Alabama, spp. nn.

Matigramma, g. n., *id. l. c.* p. 22. Allied to *Euclidia.* Type *M. pulverilinea*, sp. n., *id. l. c.*, Alabama.

Eutoremma, g. n., *id. l. c.* p. 21. Allied to *Toxocampa.* Type *E. tenuis*, sp. n., *id. l. c.* p. 23, Alabama.

Phyprosopus, g. n., *id. l. c.* p. 90. Allied to *Calpe.* Type *P. callitrichoides*, sp. n., *id. l. c.*, New York, Texas.

Notocyma, g. n., Snellen, Tijdschr. Ent. (2) vii. p. 67. Allied to *Calpe.* Type *N. pruinosa*, sp. n., *id. l. c.*, Lower Guinea.

Cirrhophanus, g. n., Grote, Canad. Ent. iv. p. 187. Allied to *Gortyna*, but with a superficial resemblance to *Halesidota.* Type *C. triangulifer*, sp. n., *id. l. c.*, Missouri.

New species :—

Leucania brantsi, Snellen, Tijdschr. Ent. (2) vii. p. 48, pl. 4. fig. 7, Lower Guinea.

Sesamia tosta, id. *l. c.* p. 50, pl. 4. fig. 8, Lower Guinea.

Caradrina sericea, id., Vlinders &c., p. 447, Amsterdam [also occurs in Germany, and is described by Speyer in S. E. Z. 1867, p. 73, *teste* Staudinger's Catalogue, ed. 2 : *cf.* also Zool. Rec. v.].

Agrotis golickii, Erschoff, Hor. Ent. Ross. viii. p. 316, Turkestan.

Graphiphora barthelemica, Wallengren, Œfv. Vet. Ak. 1871, p. 915.

Hadena (*Mamestra*) *badistriga*, Grote, Tr. Am. Ent. Soc. iv. p. 20, Canada, N. York.

Agrophila gibbosa, Snellen, Tijdschr. Ent. (2) vii. p. 50, pl. figs. 9–11, Lower Guinea; *A. tortricina*, Zeller, Verh. z.-b. Wien, xxii. p. 461, pl. 2. fig. 5, Texas.

Eumelia (*Agrophila*) *apicella*, Grote, *l. c.* p. 21, Alabama.

Acontia trista [*sic*], Snellen, *l. c.* p. 52, pl. 4. figs. 12 & 13, Lower Guinea.

Erastria hamula, p. 33, pl. 4. fig. 14, *griseola*, p. 34, pl. 4. fig. 15, *stigmatula*, p. 35, pl. 4. fig. 16, Lower Guinea : *id. l. c.*

Xanthoptera africana, p. 56, pl. 5. figs. 1 & 2, *semilutea*, p. 57, pl. 5. fig. 3, Lower Guinea : *id. l. c.*

Micra nuga and *orthogramma*, id. *l. c.* pp. 58 & 59, pl. 5. figs. 4 & 5, Lower Guinea.

Micra stali, Wallengren, *l. c.* p. 916, St. Bartholomew.

Thalpochares mandula, Zeller, *l. c.* p. 460, pl. 2. fig. 4, Texas.

Plusia orbifer, Guénée, in Vinson's 'Voyage' &c., Annexe F, p. 47, pl. 6. fig. 3, Madagascar.

Catocala retecta, Middle States, *flebilis*, p. 4, *coccinata*, p. 6, *habilis*, p. 11, Pennsylvania, *abbreviatella* and *frederici*, Texas, p. 14, *linneella*, p. 18, Eastern States, *robinsoni*, p. 20, hab. —? : Grote, *l. c.*

Cylogramma raboudou, Lucas, Ann. Sc. Nat. xv. no. 22, p. 3, Madagascar.

Trigonia wærdenialis, Snellen, *l. c.* p. 62, pl. 5. figs. 8 & 9, Lower Guinea.

Remigia impressa, Butler & Druce, Cist. Ent. v. p. 117, Costa Rica.

GEOMETRIDÆ.

Vollenhoven, Sepp's Nederl. Ins. (2) ii. gives supplementary observations to his former accounts of various (figured) stages of the following species :— *Macaria notata*, p. 223, pl. xlvii. fig. 8, egg ; *Timandra amataria*, p. 231, pl. xlix. fig. 10, imago, var. ; *Melanippe montanata*, p. 233, pl. 2. figs. 1–8, larva and pupa, with details, and food-plant.

Ellopia fasciaria. On eggs and young larvæ, *cf.* T. Groves, Ent. vi. p. 14.

Angerona prunaria. On its varieties, *cf.* Breyer, Ann. E. Belg. xv. pp. 44 & 45.

Selenia lunaria and *tetralunaria*, F. J. M. Heylaerts, fils, Tijdschr. Ent. (2) vii. p. 123.

Azelina huebneraria, Guén., occurs in California : Packard, P. Bost. Soc. xiii.

Boarmia ilicaria. On this species, *cf.* Speyer, S. E. Z. 1872, pp. 169–171.

B. adustata, Hb. Larva described by E. Gärtner, Verh. Ver. Brünn, viii. pp. 64–66.

Tephrosia crepuscularia and *consonaria*. Larvæ described by G. T. Porritt, Ent. M. M. viii. pp. 208 & 209, ix. pp. 17 & 18. On breeding varieties of the former, *cf.* J. T. D. Llewellyn, *op. cit.* p. 272. A black var. noticed by E. Earl, Ent. vi. p. 127.

Gnophos pullata. A. Fuchs describes var. *nubilata* from the Rhine district: S. E. Z. 1872, pp. 429–432.

On *Nemoria porrinata* and *viridata*, *cf.* Zeller, S. E. Z. 1872, pp. 56 & 57. *N. etruscaria*, Zell., is a false species, founded on *N. pulmentaria* ♂ and *porrinata* ♀.

Iodis vernaria. Life-history by E. Newman, Ent. vi. pp. 168 & 169.

I. vicinitaria and *invenusta*, Wgr., redescribed, Œfv. Vet. Ak. 1872, p. 51.

Eucrostis frustrataria, Wgr., redescribed: *id. l. c.* p. 52.

Omphax plantaria, Guén., occurs in E. Caffraria: *id. ibid.*

Ephyra punctaria. Larva described by G. T. Porritt, *l. c.* viii. p. 183.

Micronia eryeinaria, Guén.: Snellen, Tijdschr. Ent. (2) vii. p. 78, pl. 6. f. 10.

Fidonia atomaria, L. All stages and economy described and figured in detail, with food-plant, by De Roo van Westmaas, in Vollenhoven's continuation of Sepp's Nederl. Ins. (2) ii. pp. 196–201, pl. xliii.

Bupalus, Leach Cat., Stephens, Walk., &c., recharacterized as new under the name *Bupala*. Snellen, Vlinders, p. 602.

Sthanelia hippocastanaria, Hübn. All stages and economy described and figured in detail, with food-plant, by De Roo van Westmaas, *l. c.* pp. 185–190, pl. xli.

Acidalia degeneraria. Larva described by Buckler, Ent. M. M. ix. pp. 115–117.

A. inornata, Haw., and *deversaria*, Hb.: Rössler, S. E. Z. 1872, pp. 309 & 310.

A. imitaria. Larva described by E. Newman, *l. c.* pp. 139 & 140.

A. flaveolaria redescribed: Zeller, *l. c.* pp. 57 & 58.

A. purata, Guén., redescribed: *id.* Verh. z.-b. Wien, xxii. p. 477.

A. pygargata, *nemorivagata*, *antiloparia*, and *gazellaria*, Wgr., redescribed by Wallengren, *l. c.* pp. 52–55.

Timandra viridaria, Walk., = *ledereri*, Wgr.: *id. l. c.* p. 52.

T. neptunaria, Guén.: Snellen, Tijdschr. Ent. (2) vii. p. 78.

Cabera pusaria. A black var. noted by A. Priest, Ent. vi. p. 264.

Macaria ocellinata, Guén., and *æmulataria*, Walk., redescribed by Zeller, *l. c.* pp. 486 & 487.

Lythria plumularia redescribed: *id.* S. E. Z. 1872, pp. 58 & 59.

Abraxas grossulariata. On larvæ feeding on rose and peach, *cf.* J. R. S. Clifford, Ent. vi. pp. 172 & 173.

Abraxas ribearia, Fitch, *cf.* A. S. Packard, Rep. Ins. Mass. i. p. 13.

Phalæna petavia, Cr., 347 F, is a *Nassunia*, perhaps = *N. bupaliata*, Walk.: Wallengren, *l. c.* p. 55.

Chimatobia brumata. On the ravages of its larva, *cf.* Ent. vi. pp. 108 & 109.

Hybernia aurantiaria, ♀: F. J. M. Heylaerts fils, Tijdschr. Ent. (2) vii. p. 124.

Larentia literata, Don. Speyer considers this a good species: *l. c.* pp. 171–173.

Eupithecia. P. Mabille, Ann. Soc. Ent. Fr. (5) ii. pp. 500–502, enumerates 26 species as occurring in the department of the Aude, with short notes:—*oblongata*, Thunb., = *centaureata*, W. V.; *laquearia*, H.-S., = *merinata*, Guén.; *nepetata*, Mab., = *semigrapharia*, Mill.; *denotata*, Hübn., is distinct from *campanulata*, H.-S.; *euphrasiata*, H.-S., = *constricta*[*ta*], Mill., *nec* Guén.; *massiliata*, Mill., = *peyerimhoffata*, Mill.; *tamarisciata*, Frey, may be a summer brood of *innotata*, Hübn.

P. Mabille (*l. c.* pp. 492–499, pl. 15) redescribes and figures his *E. pyreneata*, fig. 5, *chloerata*, fig. 7, *santolinata*, fig. 4, and *lentiscata*, fig. 6, and *pauxillata*, Ramb., Boisd. (*nec* H.-S.), fig. 3 (= *expressaria*, Mill., *nec* H.-S.), = *millieriata*, Staud. He also notices *nepetata*, Mab. (= *semigrapharia*, Mill., ? Guén.), and considers *impurata*, Hübn. (= *minoraria*, Dup., = *semigrapharia*, H.-S., = *modicaria*, H.-S., var., ? = *unitaria*, H.-S.), and *E. modicaria*, Hübn. (*nec al.*, *sed* = *proluaria*, Frey), to be distinct.

Dietze describes the larvæ of *E. semigrapharia*, *fraxinata*, and of an undetermined species: S. E. Z. 1872, pp. 184, 188, 200. He also (pp. 199–204) publishes short notes on several other species, and (pl. 1. figs. 4–7, 10–19) figures the larvæ of *cauchyata*, *virgaureata*, *campanulata*, *denticulata*, *extraversaria*, *libanotidata*, *trisignaria*, *vulgata*, *semigrapharia*, *selinata*, *irriguata*, *euphrasiata*, *fraxinata*, and *laquearia*.

E. acteata. On the larva, *cf.* Speyer, *l. c.* pp. 173 & 174.

E. chloerata, Mab.: Dietze, *l. c.* pp. 329–331.

E. pygmæata and *togata*. Larvæ described by H. H. Crewe, Ent. vi. pp. 166 & 167, 223, Zool. (s. s.) vii. pp. 3193 & 3276; *cf.* also Hellins & Crewe, Ent. M. M. ix. pp. 42, 65, 113–115.

E. subciliata and *pimpinellata*. Larvæ described by Crewe, Ent. vi. pp. 125 & 126, 240; also *E. subciliata*, larva, *cf.* Crewe & Williams, Ent. M. M. ix. pp. 65 & 66.

Coremia propugnata, W. V., occurs in California: Packard, P. Bost. Soc. xiii.

Cidaria miata. Larva described by G. T. Porritt, Ent. vi. p. 49.

C. designata, Bkh., *fluviata*, Hb., and *ferrugata*, L.: *cf.* Zeller, Verh. z.-b. Wien, xxii. pp. 494 & 495.

C. lacteata, Hb., probably = second brood of *C. tristata*, L.: H. de Peyerimhoff, Pet. Nouv. 1872, p. 231.

Carsia imbutata. Larva described by H. Hellins, Ent. M. M. ix. pp. 92 & 93.

Anaitis plagiata. On habits of larva, *cf.* G. F. Mathew, Ent. vi. pp. 27 & 28.

Sudariophora [vox hybr.: ? rectius *Sudarifer*], g. n., Zeller, Verh. z.-b. Wien, xxii. p. 489. Type *S. nasutaria*, id. *l. c.* p. 450 (= *Doryodes acutalis*, Walk., nec *acutaria*, H.-S.), Texas.

New species:—

Chœrodes nubilata, A. S. Packard, P. Bost. Soc. xiii., California.

Drepanodes juniperaria, id. Rep. Ins. Mass. i. p. 13, figured in all stages

(=*D. varius*, Gr. & Rob., *cf.* Packard, Rec. Am. Ent. 1871, p. 21), Massachusetts.

Epione (*Euchlæna*) *mollicularia*, Zeller, *l. c.* p. 481, Texas.

Heterolocha edwardsata, Packard, P. Bost. Soc. xiii., California.

Ellopia californiaria, id. *l. c.*, California.

Tetracis triangulifera, id. *l. c.*, California.

Azelina behrensaria, id. *l. c.*, California.

Odontoptera chalybeata, Moore, P. Z. S. 1872, p. 580, pl. 34. fig. 4, N. India.

Metanema cervinaria, Packard, *l. c.*, California.

Biston lefuarius, Erschoff, Hor. Ent. Ross. viii. p. 317, E. Siberia.

Boarmia psilogrammaria, Texas, *fraudulentaria*, hab. — ?, Zeller, *l. c.* pp. 490 & 492; *B. buxicolaria*, P. Mabille, Ann. Soc. Ent. Fr. (5) ii. p. 490, pl. 15. figs. 1 & 2 (possibly=*B. abstersaria*, Boisd.), Department of the Aude; *B. californiaria*, Packard, *l. c.*, California.

B. derogaria, Snellen, Tijdschr. Ent. (2) vii. pl. 6. figs. 5 & 6, Lower Guinea.

Tephrosia californiaria and *ferruginosaria*, Packard, *l. c.*, California.

Geometra lineata, p. 580, pl. 34. fig. 2, Sikkim, *albiviridis*, p. 581, pl. 34. fig. 3, N. India: Moore, *l. c.*

Nemoria oporaria, Zeller, *l. c.* p. 481, Northern U.S.

Eucrostis (rectius *Euchrostis*, note) *phyllinaria*, id. *l. c.* p. 479, Texas.

Nematocampa expunctaria, Grote, Canad. Ent. iv. p. 101, Alabama.

Acidalia 5-linearia, *granitaria*, *californiaria*, *pacificaria*, and *rubrimarginaria*, Packard, *l. c.*, California; *A. ferruminaria*, Zeller, *l. c.* p. 478, Texas; *A. pulveraria*, p. 75, pl. 6. fig. 7, *reconditaria*, p. 76, pl. 6. figs. 8 & 9: Snellen, *l. c.*, Lower Guinea; *A. erschoffi*, H. Christoph, Hor. Ent. Ross. ix. p. 5, pl. 1. fig. 2, North Persia.

Syngria hamularia, Snellen, *l. c.* p. 79, pl. 6. fig. 11, Lower Guinea.

Macaria consimilata, *galbilineata*, and *succosata*, Zeller, *l. c.* pp. 483–485, Massachusetts; *M. grimmia*, Knisip River, p. 57, *getula*, Swakop River, p. 58, Wallengren, Œfv. Vet. Ak. 1872; *M. californiaria*, Packard, *l. c.*, California; *M. angolaria*, Snellen, *l. c.* p. 81, pl. 6. figs. 12 & 13, Lower Guinea.

Halia cineraria, Packard, *l. c.*, California.

Tephrina marmorata, id. *l. c.*, Nevada; *T. nemorivaga*, Wallengren, *l. c.* p. 59, Caffraria.

Panagra platyrhync[*h*]*ata*, p .59, Rondebosch, *octomaculata*, p. 60, E. Caffraria, Wallengren, *l. c.*; *P. flavifasciata*, Packard, *l. c.*, California; *P. smilodontaria*, Snellen, *l. c.* p. 83, pl. 7. figs. 1 & 2, Lower Guinea.

Scodiona scapularia, Snellen, *l. c.* p. 84, pl. 7. fig. 4, Lower Guinea.

Selidosema californiaria, Packard, *l. c.*, California.

Fidonia halesaria, Zeller, *l. c.* p. 488, Texas.

Conchylia pactolaria, Wallengren, *l. c.* p. 55, E. Caffraria.

Eupithecia schmidi, p. 190, pl. 1. fig. 2, ♂? fig. 1, larva? fig. 3, Tyrol, *chlorofasciata*, p. 192, pl. 1. figs. 8 & 9, Georgia, U.S., *digitaliaria* (=*linariata*, subspecies), p. 194, Odenwald: Dietze, S. E. Z. 1872; *E. provinciata*, P. Millière, R. Z. xxiii. p. 61, Cannes; *E. rotundipuncta*, California, *nevadata*, Nevada, Packard, *l. c.*

Hypsipetes californiata, *5-fasciata*, and *nubilifasciata*, Packard, *l. c.*, California.

Scordylia mortipax, Butler & Druce, Cist. Ent. v. p. 118, Costa Rica.

Melanippe oxybiata, Millière, *l. c.* p. 61, Cannes.

Coremia californiata, Packard, *l. c.*, California.

Camptogramma quaggaria and *sylvicultrix*, Wallengren, *l. c.* pp. 56 & 57, E. Caffraria.

Scotosia californiata, Packard, *l. c.*, California.

Cidaria nubilata, subochreata, leoninata, 4-punctata, multilineata, California, *rubrisuffusata*, Nevada, Packard, *l. c.*; *C. bistriolata* and *parinotata*, Zeller, *l. c.* pp. 493, 495, Texas; *C. guriata*, Emich, R. Z. xxiii. p. 64, and Guria, Hor. Ent. Ross. ix. p. 43, pl. 2*b*. fig. 2, Transcaucasia.

Lithostege staudingeri, Erschoff, Hor. Ent. Ross. viii. p. 317, Turan.

Chesias occidentaliata, Packard, *l. c.*, California.

Baptria californiata, id. *l. c.*, California.

Mesotype textilis, Wallengren, *l. c.* p. 60, E. Caffraria.

Pyralidæ.

A. S. Packard, "Catalogue of the *Pyralidæ* of California, with descriptions of new Californian *Pterophoridæ*," Ann. Lyc. N. York, x. pp. 257–267, enumerates 15 species of the former group, 12 new, and describes 3 new species of the latter. He also (*l. c.* pp. 267–271) publishes "Notes on some *Pyralidæ* from New England, with remarks on the Labrador species of this family," describing 5 new species. The Californian *Pyralidæ* appear to be allied as closely to the fauna of Eastern N. America as to Europe. He does not regard the *Phycidæ* as a distinct family from the *Pyralidæ*, or, at most, considers them a subordinate group connecting the lower *Pyralidæ*, such as *Botys* and *Scopula*, with the *Crambi*.

On the classification of the *Pyralidina*, *cf.* Snellen, Tijdschr. Ent. (2) vii. pp. 85–87.

P. C. Zeller ("Columbianer Arten der Gattungen Chilo, Crambus et Scoparia," S. E. Z. 1872, pp. 463–481, pl. 2) remarks on the species taken by Von Nolcken, and describes some as new.

Zanclognatha zelleralis (from Neuholdensleben) and *Scoparia zelleri* (from the Upper Harz), both Silesian species, noted by W. Henäcker, B. E. Z. 1872, p. 238.

Pangrapta, Hübn., recharacterized by Grote; and *P. decoralis* (type) redescribed, Tr. Am. Ent. Soc. iv. p. 91.

Bleptina caradrinalis, Guén., redescribed by Grote, *l. c.* p. 93.

B. interior[!], Grote, *l. c.* p. 94, Alabama, Texas.

Hypena. Grote describes 14 species, some new, as occurring in the Atlantic district, U. S., *l. c.* pp. 101–104; *H. erectalis*, var. *subrufalis* is described; *H. benignalis*, Walk.,=*H. baltimoralis*, Guén., ♂, *id. l. c.* p. 102.

Hypena internalis, Robinson (*nec* Guén.) is renamed *torenta*, pp. 24, 103; *H. fallacialis*, Walk.,=*Renia discoloralis*, Guén., p. 25: Grote, *l. c.*

Herminia. Guénée's section §§. S. g. is named *Philometra*, but not recharacterized or adopted as a generic name: *id. l. c.* p. 98.

H. morbidalis, pedipilalis, and *cruralis*, Guénée, redescribed: *id. l. c.* pp. 96 & 97.

H. modestalis, Heyd., *cf.* Zeller, S. E. Z. 1872, pp. 54–56.

Clanyma angulalis, Hübn., and *asopialis*, Guén., redescribed by Grote, *l. c.* pp. 107 & 108.

Epizeuxis phæalis and *americalis*, Guén.; *æmula*, Hübn.: Zeller, Verh. z.-b. Wien, xiii. pp. 470 & 471.

Zanclognatha pedipilalis, Guén., and *Z. lituralis*, Hübn., described, *id. l. c.* pp. 472 & 473.

Aglossa pinguinalis. Erschoff describes var. *asiatica* from Turan and Persia. Hor. Ent. Ross. viii. p. 317.

Pyralis forficalis. Larva destructive to cabbages, *cf.* C. G. H. Brischke, Schr. Ges. Danz. (2) ii. pts. 3 & 4, no. 9. p. 25. Its occurrence in California is recorded by Packard, Ann. Lyc. N. York, x. p. 265.

Pyralis saccharalis, F. On this and other species feeding on sugar-cane, *cf.* Zeller, S. E. Z. 1872, pp. 466 & 467.

Asopia fimbrialis, W. V., and *A. olinalis*, Guér. (=*trentonalis*, Led., =*costalis*, auctt. Amer.): *id.* Verh. z.-b. Wien, xxii. pp. 491–500.

Acentropus. After a thorough examination of the literature of this genus and of numerous specimens, Dunning concludes that *Acentropus* is Lepidopterous, and that there is but one species, *niveus*, Ol., the females of which vary in alar development. Tr. E. Soc. 1872, pp. 121–156, 281, 282. McLachlan (*op. cit.* pp. 157–162) describes and figures the genital segments of several specimens, and withholds his judgment as to the probable number of species (*cf.* also E. Newman, Ent. vi. pp. 153–158; Zool. s. s. vii. pp. 3117–3125).

C. Ritsema admits two species of *Acentropus*—*niveus* and *latipennis*: Pet. Nouv. 1872, p. 200.

Botys opacalis, Hübn., appears to be distinct from *ærealis*, Hübn.; *ærealis*, H. S., =*limbipunctalis*, Zell. Zeller, S. E. Z. 1872, pp. 97–99. *B. fodinalis*, Led., from California, is redescribed by Packard, Ann. Lyc. N. York, x. p. 263. *B. inquinitalis*, Zell., probably = *Scopula glacialis*, Pack.: Packard, *l. c.* p. 271.

B. octomaculata, L. (=*Ennychia glomeralis*, Walk.); *B. laticlaria*, Grote (=*Rhodaria tyralis*, var., Walk.); *B. cinerosa*, Gr. (=*B. laticlaria*, spring brood?); *B. signatalis*, Walk.; *B. marculenta*, G.; *B. citrina*, Gr. (=*B. apertalis*, pt., Walk.); *B. ventralis*, Gr.; *B. rubigalis*, Guén. (=*ferrugalis*, var.?); *B. subjectalis*, Led. (=*euphæsalis*, Walk., ?=*illibalis*, Hübn.?); *B. adipaloides*, Gr. (=*Samea elealis*, *liparalis* [*nec* Guén.], and *B. tædialis*, Walk.); *B. flavidalis*, Gr. (=*lucoalis* and *cinctipedalis*, Walk.); and *B. thesealis*, Led.? (=*partactalis*, Led.). On these N. American species, *cf.* Zeller, Verh. z.-b. Wien, xxii. pp. 503–517.

B. ægrotalis, Zell.: Sellen, Tijdschr. Ent. (2) vii. p. 90, pl. 7. fig. 8.

Conchylodes diaphana, Cr.: Snellen, *l. c.* p. 95, pl. 7. fig. 13.

Isopteryx fœdalis and *tenellalis*, Guén., appear to be the same species. Snellen, *l. c.* p. 96.

Eurycreon rantalis, Guén., and *crinitalis*, Led.: Zeller, *l. c.* p. 519.

Mesographe stramentalis, Hübn. (=*Pionea cunusalis*, Walk.): *id. l. c.* p. 520.

Ebulea crocealis, Tr. Millière describes var.? *oxybialis*. R. Z. xxiii. p. 62, Valley of Cannet.

Crocidophora tuberculalis, Led.: Zeller, *l. c.* p. 521.

Blepharomastix ranalis, Guén. (= *Botys gracilis*, Grote): *id. l. c.* p. 523.

Homophysa glaphyralis (Guén.?), Led., and *H. sesquistrialis* (Hübn.?), Led.: *id. l. c.* p. 524.

Nomophila noctuella. On its occurrence in California, and general variation and distribution, *cf.* Packard, *l. c.* pp. 258, 260. He adds, "Such cosmopolitan forms give rise to the suspicion that they are relics of a preceding geologic age, which is borne out by the fact that quite a gap separates it from its nearest allies."

Ephestia artemisiella. Larva described by Buckler, Ent. M. M. ix. pp. 143 & 144.

Trachonitis cristella, Hübn. Larva described by A. Gärtner, Verh. Ver. Brünn, viii. pp. 69 & 70.

Pempelia albariella, Zeller. *Phycis davisellus*, Newm., is apparently not this species. Doubleday, Ent. M. M. viii. p. 271.

P. lignosella, petrella, and allies: Zeller, Verh. z.-b. Wien, xxii. pp. 544 & 545.

Eudorea? *frigidella*, Pack., = *P. fusca*, Haw. Packard, Ann. Lyc. N. York, x. p. 270.

Phycita (*Acrobasis*) *nebulo*, Walsh. Fully described and figured in all stages with notice of habits, parasites, &c., by Riley, Rep. Ins. Mo. iv. pp. 38–42.

Anerastia farrella. Larva feeds on *Anthyllis vulneraria*: Schleich and Stainton, Ent. M. M. viii. p. 290.

Epischnia farrella, Curt. (= *Myelois lafauryella*, Const.), and *E. leucoloma* H.-S.: Zeller, *l. c.* p. 558.

Crambus. F. Buchanan White describes all the British species, noting their distribution in Britain and on the Continent. He also notices those continental species which are likely to occur in Britain. Scot. Nat. i. pp. 135–141, 169–174 (also published separately).

C. verellus, Zinck., new to Britain, has occurred at Folkestone: *cf.* H. Vaughan and H. R. Cox, Ent. M. M. ix. pp. 88, 161; also H. G. Knaggs, Ent. Ann. 1873, p. 42, fig. 1.

C. rhombellus, Zell., = *conchellus*, W. V.; *C. pinetellus* and *pauperellus* are distinct. Zeller, S. E. Z. 1872, pp. 99 & 100.

C. prasinellus and *elegans* (*terminellus*), Zell.: *id. l. c.* pp. 470, 473, pl. 2. figs. 3, 5.

C. zermattensis, Frey, redescribed: M.T. Schw. ent. Ges. iii. p. 478.

C. albiclavellus, Schl., = *agitatellus*, var.; *C. polygastrinellus*, Koll., = *decorellus*, Zinck.; *C. terminellus*, Zell., = *elegans*, Clem., and is confounded by Walker with *chalybeirostris*, Zell., as *aurifimbrialis*. On these and other N. American species, *cf.* Zeller, Verh. z.-b. Wien, xxii. pp. 535–540.

Catharylla pulchella, Walk. ?, described and figured from Massachusetts and Texas, p. 541, pl. 3. f. 18; *C. nummulalis* (Hubn. ?), Zell., = *Urola michrochryselle* and *subæneseens*, Walk., according to Grote. The latter may be *fuscipes*, Zell.; and Grote seems to have confounded several species as *nummulalis*, which, however, is a variable species, and widely distributed in N. America. Zeller, *l. c.* p. 542.

Eromene texana, Rob., probably = *C. ocellea*: id. *l. c.* p. 543.

Schœnobius longirostrellus, Clem. Zeller (*l. c.* p. 533) describes its vars. He doubts if *melinellus, clemensellus, dispersellus, tripunctellus*, and *tripunctellus*, Robinson, are distinct.

Chilo neuricellus and *obliteratellus*, Zell.: *id.* S. E. Z. 1872, p. 465.

New genera and species :—

Coptocnemia, Zeller, Verh. z.-b. Wien, xxii. p. 475. Allied to *Pechypogon*, p. 476, pl. 2. fig. 10 *a*, *b*, Texas.

Cavifrons, id. *l. c.* p. 502. Perhaps a mere section of *Sedenia*. Type *C. biundulalis*, sp. n., *id. l. c.* pl. 3. fig. 14 *a–c*, Texas.

Chalcoela, id. *l. c.* p. 528. Type *C. aurifera*, sp. n., *id. l. c.* p. 529, pl. 2. fig. 12 *a*, *b*, Texas.

Dicymolomia, id. *l. c.* p. 530. Allied to the last. Type *D. decora*, sp. n., *id. l. c.* p. 531, pl. 2. fig. 13 *a–c*, Texas.

Colobochila saligna, id. *l. c.* p. 488, Texas.

Hypena albisignalis, p. 463, *achatinalis*, p. 468, pl. 2. fig. 7 (= *madefactalis*, Guén. ?), *trituberalis*, p. 469, fig. 6, Texas, *laciniosa*, p. 464, fig. 8, Massachusetts ?, *pallialis*, p. 466, fig. 9, Texas and Massachusetts, *id. l. c.*; *H. citata*, p. 101, Alabama, *sordidula*, p. 103, and *profecta*, p. 104, Pennsylvania, Grote, Tr. Am. Ent. Soc. iv.

Renia brevirostralis, p. 25, Pennsylvania, Alabama, *larvalis*, p. 26, Pennsylvania, Texas, *restrictalis*, p. 26, Pennsylvania, *centralis*, West Virginia, *pastoralis*, Pennsylvania, *belfragii*, Texas, p. 27 : Grote, *l. c.*

Renia ulutalis and *plenilinealis*, id. *l. c.* p. 99.

Herminia lævigata, p. 95, Atlantic States, *marcidilinea*, p. 97, Pennsylvania, Alabama, *obscuripennis*, Alabama, *ochreipennis*, p. 98, West Virginia, Pennsylvania, *serraticornis*, p. 98, *longilabris*, p. 99, Pennsylvania, Virginia : *id. l. c.*

Madopa interpuncta[*ta*], id. *l. c.* p. 93, Alabama.

Tortricodes bifidalis, p. 105, Atlantic district, *indivisalis*, p. 106, New York, Alabama (? sexes of one sp.) : *id. l. c.*

Zanclognatha deceptricalis, Zeller, Verh. z.-b. Wien, xxii. p. 474, Ohio ?

Platydia selenialis, Snellen, Tijdschr. Ent. (2) vii. p. 64, Lower Guinea.

Rivula terrosa, id. *l. c.* p. 66, pl. 5. fig. 10, Lower Guinea.

Acropteris hypocrita, pl. 6. figs. 1 & 2, Lower Guinea, *mendax*, figs. 3 & 4, Java, Africa : *id. l. c.* p. 71.

Palthis walkeri, Wallengren, Œfv. Vet. Ak. 1871, p. 918, St. Bartholomew.

Aglossa cuprina, Zeller, *l. c.* p. 497, Texas.

Asopia himonialis [? *hemionionalis*], Massachusetts, *binodulalis*, Texas, *id. l. c.* pp. 500 & 501 ; *A. cultralis*, Snellen, *l. c.* p. 88, pl. 7. fig. 5, Lower Guinea.

Hercyna staudingeri, H. Christoph, Hor. Ent. Ross. ix. p. 6, pl. 1. fig. 3, Persia.

Anthophilodes conchylialis, id. *l. c.* p. 7, pl. 1. fig. 4, Sarepta.

Cataclysta metalliferalis, Packard, Ann. Lyc. N. York, x. p. 265, California.

Botys tithonialis, p. 504, pl. 3. fig. 15, Siberia, *fracturalis*, p. 509, fig. 16, Texas, *abdominalis*, p. 515, N. America, Zeller, *l. c.*; *B. auralis*, Peyerimhoff, Pet. Nouv. 1872, p. 252, Alsace ? (*cf.* also 1871, pp. 168 & 169) ; *B. californicalis*[!], p. 260, California, *subolivalis*, p. 261, note, Maine, *unifascialis* and *profundalis*, p. 261, *mustelinalis*, p. 262, *semirubralis*, p. 263, *perrubralis*, p. 265, all from California, Packard, *l. c.*; *B. tridentalis*, p. 89, pl. 7. figs. 6 & 7, *auralis*, p. 90, pl. 7. figs. 9 & 10, Lower Guinea, Snellen, *l. c.*; *B. monialis*, Erschoff, Hor. Ent. Ross. viii. p. 317, Samarcand.

Marasmia rectistrigosa, Snellen, *l. c.* p. 92, pl. 7. figs. 11 & 12, Lower Guinea.

Paraponyx hartoghialis, id. *l. c.* p. 97, pl. 7. figs. 14 & 15, Lower Guinea.

Cataclysta tripunctalis, id. *l. c.* p. 98, pl. 8. fig. 1, Lower Guinea.

Eurycreon (*Spilodes*) *cereralis*, Zeller, Verh. z.-b. Wien, xxii. p. 517, Texas.

Scopula occidentalis, Packard, Ann. Lyc. N. York, x. p. 260, California.

Crocidophora serratissimalis, Zeller, *l. c.* p. 521, Massachusetts, Texas.

Hemophysa lentiflualis and *unicolalis*, id. *l. c.* pp. 525 & 526, Texas.

Scoparia scotica, F. B. White, Ent. M. M. viii. p. 169, Perth (*cf.* also H. G. Knaggs, Ent. Ann. 1873, p. 42); *S. biscutella*, p. 474, pl. 2. fig. 8, *tersella*, p. 476, fig. 9, *tricolor*, p. 478, fig. 10, *longipennis*, p. 479, fig. 11, Zeller, S. E. Z. 1872, Bogota.

Galleria inimicella, Zeller, Verh. z.-b. Wien, xxii. p. 559, pl. 3. fig. 20, Texas.

Melissoblaptes œconomellus, Mann, Verh. z.-b. Wien, xxii. p. 35, Bulgaria; *M. fulminalis*, Zeller, *l. c.* p. 560, pl. 3. fig. 19, Texas.

Zophodia balli, Zeller, *l. c.* p. 550, pl. 3. fig. 21 *a*, *b*, Texas.

Anerastia tetradella, *glareocella*, *binotella*, Texas, *hæmatica*, Massachusetts: *id. l. c.* pp. 552–555.

Acrobasis rubrifasciella, Packard, Ann. Lyc. N. York, x. p. 267, Maine (with remarks on transformations, indicating that 2 species may possibly be included under the name); *A. juglandis* (Le Baron), Riley, Rep. Ins. Mo. iv. pp. 42 & 43, United States, figured and habits described.

Myelois ciliatella, Zeller, *l. c.* p. 557, Sarepta; *M. albiplagiatella*, Packard, *l. c.* p. 269, New Hampshire; *M. stibiella*, Snellen, *l. c.* p. 104, pl. 8. figs. 7 & 8, Lower Guinea; *M.* (?) *diffusella* (Zell. MS.), Christoph, *l. c.* p. 8, pl. 1. fig. 5, Sarepta.

Ematheudes straminella, Snellen, *l. c.* p. 107, pl. 8. fig. 9, Lower Guinea.

Nephopteryx consobrinella, Texas, *basilaris*, Massachusetts, Zeller, *l. c.* pp. 548 & 549, pl. 3. figs. 22 & 23; *N. latifasciatella*, Maine, p. 269, *roseatella*, Massachusetts, p. 270, Packard, *l. c.*

Ephestia polyxenella,, Millière, R. Z. xxiii. p. 63, Cannes, Caucasus.

Pempelia (?) *tartarella* and *incantella*, Zeller, *l. c.* pp. 544 & 545, Texas; *P. fenestrella* and *leoninella*, p. 259, California, *ovalis*, p. 269, Maine, Packard, *l. c.*; *P. hammondi*, Riley, *l. c.* pp. 44–46, fig. 21, described in all stages, Missouri, Illinois.

Tetralopha melanogramma, Zeller, *l. c.* p. 546, pl. 3. fig. 24 *a*, *b*, Texas.

Calamotropha robustella, p. 100, pl. 8. fig. 2 & 3, *abjectella*, p. 101, pl. 8. fig. 4, Snellen, *l. c.*, Lower Guinea.

Chilo cervinellus, Nilghiris, S. India, pl. 34. fig. 7, *bivitellus*, fig. 8, *interruptellus*, fig. 5, p. 581, *inconspicuellus*, fig. 6, p. 582, Bombay: Moore, P. Z. S. 1872.

Scirpophaga [vox hybr.] *vestaliella*, Zeller, *l. c.* p. 532, Texas.

Crambus xiphiellus, p. 467, pl. 2. fig. 1, *falcarius*, p. 469, fig. 2, *pulverulentellus*, p. 473, fig. 7, Bogota, *nolckeniellus*, p. 470, fig. 4, *immunellus*, p. 472, fig. 6, Ubaque, Zeller, S. E. Z. 1872; *C. bidens*, p. 535, pl. 3. f. 17, *floridus*, p. 537, Massachusetts, *id.* Verh. z.-b. Wien, xxii.; *C. oxybiellus*, Millière, R. Z. xxiii. p. 62, Valley of Cannet; *C. inconspicuellus* and *troglodytellus*, Snellen, *l. c.* pp. 102 & 103, pl. 8. figs. 5 & 6, Lower Guinea.

Eromene californicalis [? *californica*, vel *californiæ*], Packard, Ann. Lyc. N. York, x. p. 264, California.

Catharylla contiguella, p. 540, Cuba, *rufisignella*, p. 542, Texas: Zeller, Verh. z.-b. Wien, xxii.

Jartheza biplagella, Moore, *l. c.* p. 582, pl. 34. fig. 9, Bombay.

Tortricidæ.

Vollenhoven, Sepp's Nederl. Ins. (2) ii., supplements former accounts of various (figured) stages of the following species:—*Tortrix variega[ta]na*, p. 226, pl. xlviii. figs. 6 & 7, eggs; *T. ribe[s]ana*, p. 229, pl. xlix. figs. 1–9, eggs and larva, with details; *Grapholitha corticana*, p. 227, pl. xlviii. fig. 8, imago.

On species of *Tortricidæ* destructive to the vine in Switzerland, *cf.* Kübler, Verh. Schw. Ges. 1871, pp. 52–54.

A. Gärtner (Verh. Ver. Brünn, viii. pp. 70–84) describes the larvæ or transformations of *Conchylis zoegana, roseana, kindermanniana, smeathmanniana, tischerana, cruentana, atricapitana, pulvillana, Grapholitha cæcimaculana, reliquana, servilliana*, and *Dicrorampha alpinana*, and mentions the larvæ and pupæ of several other species.

Barrett (Ent. M. M. ix. pp. 124–130) publishes "Notes on British Tortrices, with descriptions of two new species." *Hypermecia augustana*, Hübn., *Antithesia grevilliana*, Curt., and *Dichelia gnomana*, L., are redescribed (the last new to Britain: *cf.* Knaggs, Ent. Ann. 1873, p. 43). The paper mainly consists of short synonymic notes, not original.

Barrett (*l. c.* pp. 25–31) notices the British species of the genera *Dicrorampha* and *Endopisa*, as restricted by Wilkinson. *D. flavidorsana*, Knaggs, =*petiverella*, var.; *D. politana*, Hübn., is apparently distinct; *D. tanaceti*, Staint., =*saturnana*, Hein. (*nec* Guén., Wilk., Staint.), but not *plumbagana*, Tr.; *Endopisa nigricana*, Steph., =*tenebrosana*, Dup., =*pisana*, Guén., =*proximana*, Wilk., =*nebritana*, Wilk., Doubl., *nec.* Tr. Guénée's description of his *D. senectana* is reproduced.

Steganoptycha augustana new to Scotland: J. Dunsmore and F. B. White, Scot. Nat. i. p. 176.

Teras mixtana, Hübn. Peyerimhoff describes and figures var. *provinciana* from Cannes: Ann. Soc. Ent. Fr. (5) ii. p. 8, pl. 5. fig. 2.

Retinia turionella, var. *mughiana*, Zell.: Zeller, S. E. Z. 1872, pp. 103 & 104.

Grapholitha pflugiana, Hübn., var. *alsatiana*, from Alsace, described and figured: Peyerimhoff, *l. c.* p. 10, pl. 5. figs. 4 & 4 *a*.

G. pusillana, Peyerimhoff, from the Vosges, is redescribed and figured by him, *l. c.* p. 9, pl. 5. figs. 3 & 3 *a*.

Sciaphila wahlbomiana, L., and *minusculana*, Zell. On their structure, transformations, variation, &c., *cf.* Zeller and O. Hofmann, S. E. Z. 1872, pp. 102 & 103, 433–446. (Hofmann's paper is translated, Ent. Ann. 1873, pp. 50–69.)

New species:—

Tortrix albardana, Snellen, Tijdschr. Ent. (2) vii. p. 108, pl. 8. fig. 10, Lower Guinea; *T. cinderella*, Riley, Rep. Ins. Mo. iv. pp. 46 & 47, fig. 22, described and figured in all stages, Missouri; *T. malivorana*, Le Baron, Rep. Ins. Illin. pp. 16 & 20, Illinois, Am. Nat. v. pp. 209–212 (habits noticed by Riley and Wier, Rep. Ins. Mo. iv. pp. 47–49).

Antithesia staintoniana, Barrett, Ent. M. M. ix. p. 127, Perthshire (*cf.* Knaggs, Ent. Ann. 1873, p. 44).

Dicrorhampha herbosana, Barrett, *l. c.* p. 27, England (*cf.* Knaggs, Ent. Ann. 1873, pp. 45 & 46).

Atteria leopardina, p. 89, New Granada, *volcanica*, p. 90, Costa Rica, Butler, Cist. Ent. iv.

Steganoptycha languentana, Staudinger, Verh. z.-b. Wien, xxii. p. 733, Upper Engadine.

Teras cyaneana, Peyerimhoff, Ann. Soc. Ent. Fr. (5) ii. p. 7, pl. 5. figs. 1 & 1 *a*, Switzerland.

Phthoroblastis fraxinana, id. *l. c.* p. 12, pl. 5. fig. 5, Colmar.

Retinia amethystana, id. Pet. Nouv. 1872, p. 289, Alsace? (?=*R. obesana*, Delaharpe).

Conchylis exasperatana (Zell. MS.), p. 9, pl. 1. fig. 6, *halophilana*, p. 10, pl. 1. fig. 7, *coagulana* (Zell. MS.), p. 11, pl. 1. fig. 8, H. Christoph, Hor. Ent. Ross. ix., Sarepta; *C. robinsonana*, Grote, Canad. Ent. iv. p. 161, Alabama.

Aspis jaspidana, Christoph, *l. c.* p. 12, pl. 1. fig. 9, Sarepta.

Aphelia robustana, id. *l. c.* p. 13, pl. 1. fig. 10, Sarepta, Bogdo.

Grapholitha conformana, Mann, Verh. z.-b. Wien, xxii. p. 36, S. Europe, Brussa; *G. cæmentana* (Zell. MS.), p. 14, pl. 1. fig. 11, *agnatana*, p. 15, pl. 1. fig. 12, *sarmatana* (Zell. MS.), p. 16, pl. 1. fig. 13, *labyrinthicana* (with notice of larva), p. 17, pl. 1. fig. 14, Christoph, *l. c.*, Sarepta; *G. improbana*, Snellen, *l. c.* p. 109, pl. 8. fig. 11, Lower Guinea.

Sericoris doubledayana, Barrett, *l. c.* viii. p. 246, England (*cf.* Knaggs, Ent. Ann. 1873. p. 45).

Tineidæ.

H. T. Stainton has republished the scattered papers of the late Dr. Brackenridge Clemens, under the title of 'The Tineina of North America' (London: 1872, 8vo, pp. xv & 232, woodcuts), adding a classified arrangement of species, brief notes on those described, and on Clemens's writings on other groups of *Lepidoptera*; and extracts from the correspondence of Clemens, Walsh, and Stainton. The work is illustrated by reproductions of Clemens's drawings of structural detail of various genera, &c.

A tabular arrangement of the groups of *Tineidæ* by Clemens (who regarded the *Tortricidæ* as a section of this family) is given by Stainton, *l. c.* pp. 34 & 35.

On various leaf-mining larvæ, *cf.* E. L. Ragonot, Pet. Nouv. 1872, p. 232. An unknown mine is figured by Clemens, *l. c.* p. 27.

On fungus-feeding *Tineina*, *cf.* C. G. Barrett, Ent. M. M. viii. pp. 250 & 251.

Gärtner notices the larvæ or pupæ of *Argyresthia gædartella*, *Hypsolopha barbella*, *Anacampsis subsequella*, *Gracilaria stigmatella*, *G. phasianipennella*, *Coleophora fuscedinella*, *limosipennella*, *otitæ*, *tiliella*, &c.: Verh. Ver. Brünn, viii. pp. 84–90.

An hitherto unpublished plate by Clemens, representing details of the genera *Tinea*, *Xylesthia*, *Amydria*, and *Anaphora*, is given by Stainton, *l. c.* p. 60.

Erapate duratella, v. Heyd., redescribed: H. Frey, MT. schw. ent. Ges. iii. p. 478.

Tinea biflavimaculella, Clemens, = *T. rusticella*, Hübn., v. *spilotella*, Tengstr.; *T. carnariella*, Cl., = *T. pellionella*, L.?; *T. lanariella*, Cl., = *T. biselliella*, Humm.; *T. nubilipennella*, Cl., = *T. fuscipunctella*, Haw.; *T. variatella*, Cl., = *T. granella*, L.?; Stainton, *l. c.* p. viii.

T. pallescentella and *rusticella*. Larvæ found feeding on a dead and dried-up cat. C. Eales, Ent. M. M. viii. pp. 209, 210.

T. tapetzella, egg described and figured: Vollenhoven, Sepp's Nederl. Ins. (2) ii. p. 223, pl. xlvii. fig. 7.

Anaphora agrotipennella. ♀ described: Grote, Canad. Ent. iv. pp. 142, 143.

Nemophora reaumurella, Peyerimhoff, redescribed and figured by him, Ann. Soc. Ent. Fr. (5) ii. p. 13, pl. 5. figs. 6 & 6 *a*.

Nemotois inauratellus, Dup., redescribed: *id. l. c.* p. 14.

Plutella vigilariella, Clemens, = *porrectella*, L.; *P. limbipennella*, Cl., = *cruciferarum*, Zell.; *P. mollipedella*, Cl., = *cruciferarum*, ♀ ?: Stainton, *l. c.* p. ix.

Gelechiidæ. V. T. Chambers seems inclined to unite all the genera of this family. Canad. Ent. iv. p. 148.

Psecadia flavitibiella noticed by Zeller, S. E. Z. 1872, p. 104.

P. funerella. Larva described and figured: Vollenhoven, Sepp's Nederl. Ins. (2) ii. p. 227, pl. xlviii. fig. 9.

Scythropia crataegella, L. All stages and economy described and figured with details and food-plant: De Roo van Westmaas, in Vollenhoven's continuation of Sepp's Nederl. Ins. (2) ii. pp. 208–211, pl. xlv.

Chimabacche phryganella, Hübn. The like notice: *id. l. c.* pp. 212–219, pl. xlvi.

Depressaria yeatiana feeds on wild carrot. Stainton, Ent. M. M. ix. p. 113.

D. depressella. On variation in larva, *cf.* L. Webb, Ent. M. M. ix. p. 144.

D. liturella, W. V., = *Phalæna kækritziana*, L. Speyer, S. E. Z. 1872, pp. 174 & 175.

Gelechia tripunctella (and var. *maculosella*, H.-S.) and *continuella*, Zell.: Zeller, *l. c.* pp. 104–108. *G. libertinella* and allies: *id. l. c.* pp. 112–115.

G. hermanella, Staint. Comments by V. T. Chambers, Canad. Ent. iv. pp. 67 & 68.

Holcocera glandulella, Riley, Canad. Ent. iv. pp. 18 & 19; Rep. Ins. Mo. iv. pp. 144 & 145, fig. 66 (described in all stages), United States.

Endrosis (?) *kennicottella*, Clemens, ? = *fenestrella*, Scop. [*lacteella*, W.V.; *fenestrella*, Scop., is a *Thyris*, sec. Werneburg]: Stainton, Tin. N. Amer. p. xi.

Anarsia pruniella, Cl., = *lineatella*, Zell.: Chambers, Can. Ent. iv. p. 208.

Butalis fallacella, *amphonycella*, *laminella*, and *chenopodiella*: Zeller, *l. c.* pp. 115–117.

B. flavifrontella, Clem., ? = *basilaris*, Zell.; *B. malutella*, Cl., ? = *impositella*, Zell.: Stainton, *l. c.* p. xi.

Antispila rivillii. On its rediscovery, *cf.* Stainton, P. E. Soc. 1872, pp. 23, 24; fully described, Ent. M. M. ix. pp. 54–56.

A. nyssiifoliella. On its transformations, *cf.* Clemens, *l. c.* p. 20.

Aspidisca. A species bred from poplar by Stainton, Ent. M. M. ix. p. 18.

A. splendoriferella. Transformations described by Clemens; imago noticed by Stainton, Tin. N. Amer. pp. 26, 27, 105.

Argyresthia oreasella, Clemens, = *andereggiella*, Dup. Stainton, *l. c.* p. xi.

Elachista apicipunctella, Staint. All stages and economy described and figured with details and food-plant. H. Albarda, in Vollenhoven's continuation of Sepp's Nederl. Ins. (2) ii. pp. 179–184, pl. xl.

Lithocolletis robiniella. On its transformations, *cf.* Clemens, *l. c.* pp. 9–12.

Phyllocnistis vitigenella. On the larva, *cf.* Clemens, *l. c.* p. 25.

Zelleria saxifragæ, Staint., new to Britain. Trail & White, Scot. Nat. i. p. 176; Ent. M. M. viii. p. 271; Stainton, Ent. Ann. 1873, pp. 48 & 49, fig. 3 (who also, *l. c.* fig. 2, notices and figures *Z. fasciipennella*, Logan).

Gracilaria. V. T. Chambers classes the genera *Coriscium*, Zell., *Parectopa*, Clem., and *Euspilapteryx*, H.-S., under this, thinking it is quite premature to subdivide it. He also notices *G.* (*Parectopa*) *robiniella*, Cl., pp. 8 & 9; *G. desmodifoliella*, Cl., = *violacella*, Cl., *olim*, pp. 26 & 27. Canad. Ent. iv. pp. 7 & 8.

G. syringella. Larva: L. Glaser, Pollich. 28 & 29, pp. 34 & 35.

Coriscium sulphurellum, Haw. Peyerimhoff describes and figures var. *aurantiellum* from Hyères. Ann. Soc. Ent. Fr. (5) ii. p. 200, pl. 6. fig. 10.

Coleophora cistorum, Peyerimhoff, redescribed and figured by him, *l. c.* p. 199, pl. 6. figs. 9 & 9 *a*.

Bedellia staintonella, Clemens, = *B. somnulentella*, Zell.: Stainton, Tin. N. Amer. p. xii.

Chauliodus daucellus, Pey., new to Britain: Stainton, Ent. Ann. 1873, p. 49.

Stagmatophora albiapicella. Transformations noticed: G. R. v. Frauenfeld, Verh. z.-b. Wien, xxii. pp. 395 & 396.

Cemiostoma. Chambers, Am. Nat. iv. pp. 489 & 490.

C. coffeellum. Life history by B. P. Mann, Amer. Nat. vi. pp. 332–341, with figs. pp. 596–607.

Bucculatrix pomifoliella, Clem., figured, with description of larva, pupa, and habits, by Riley, Rep. Ins. Mo. iv. pp. 49–51, fig. 23.

New genera and species:—

Enæmia, g. n., Zeller, Verh. z.-b. Wien, xxii. p. 562. Allied to *Psecadia*. *E. psammitis*, and *crassivenella*, spp. nn., *id. l. c.* pp. 562 & 563, pl. 3. figs. 26 & 27, Texas.

Agnippe, g. n., Chambers, Canad. Ent. iv. p. 194. Allied to *Gelechia* by the palpi, but with more pointed and convoluted wings, and by the neuration to *Anorthosia* and *Chrysochorys*, Clem. *A. bicolorella* and *fuscipulvella*, spp. nn., *id. l. c.* p. 195, Kentucky.

Adrasteia[*-tia*], g. n., *id. l. c.* p. 149. Allied to *Gelechia*; 2nd joint of palpi clothed beneath with a dense spreading but scarcely divided brush; basal joint of palpi distinctly clavate; wings with distinct though small tufts of raised scales, and rows of separate raised scales not in tufts. *A. alexandriacella* and *fasciella*, spp. nn., *id. ibid.*, Kentucky; *A. quercifoliella* (= *Depressaria bicostomaculella*, Chamb., *olim* [less appropriate name !], *id. l. c.* p. 206; *D. querciella* is also referred to this genus, p. 207.

Hagno, g. n., *id. l. c.* p. 129. Probably identical with *Psilocorsis*, Cl. Types *Depressaria cryptolechiella*, Chamb., and *H. faginella*, sp. n., *id. l. c.* p. 131.

Telphusa [*Thelphusa*, Latr.], g. n., *id. l. c.* p. 132. Allied to *Depressaria*; abdomen not depressed; antennæ more setiform; palpal brush very small, though with a trace of a longitudinal division; terminal joint of palpi shorter than second. Type *T. curvistrigella*, sp. n., *id. l. c.* p. 132 (= *Gelechia longifasciella*, Clem., *cf.* p. 174).

Cirrha, g. n., *id. l. c.* p. 146. Allied to *Depressaria*; antennæ more di-

stinctly pectinated; brush on the palpi long, ragged, not divided; abdomen less flat. Type *C. platanella* (=*Depressaria albisparsella*, Chambers, *olim* [name changed for one more appropriate!]).

Venilia [long preocc. in *Geometridæ*], g. n., *id. l. c.* p. 207. Allied to *Anarsia*, *Cleodora*, and *Hypsilophus*. Neuration and tuft at the end of 2nd joint of palpi resembles *Anarsia*; antennæ slender, as in *Cleodora*, but wings wider, and terminal joint of palpi too long and slender. Type *V. albipalpella*, sp. n., *id. l. c.* p. 208, Kentucky.

Begoe, g. n., *id. l. c.* p. 209. Allied to *Hypsilophus*; terminal joint of palpi a little more robust, 2nd joint clavate, rounded at apex, laterally compressed, vertically thickest just before the end, forming a thick, rather compact, undivided brush. Type *B. costolutella* [rectius *luteicostella*], sp. n., *id. ibid.*, Kentucky.

Sagaritis [used on a plate by Hübner in *Rhopalocera*, and preoccupied in *Ichneumonidæ*], g. n., *id. l. c.* p. 225. Possibly=*Chætochilus*; allied to *Anorthosia*, except in neuration, and to *Hypsilophus* in neuration and palpi. Type *S. gracilella*, sp. n., *id. l. c.* p. 226, Kentucky.

Promiba yuccasella, Riley, g. & s. nn. Habits &c. described: Nature, vi. p. 444, in a report of Amer. Assoc.

Solenobia pretiosa, Stainton, Ent. M. M. viii. p. 233, Tangiers.

Tinea prætoriella (Zell. MS.) H. Christoph, Hor. Ent. Ross. ix. p. 19, pl. 1. fig. 15, Sarepta.

Anaphora mortipennella and *agrotipennella*, Grote, Can. Ent. iv. p. 137, Central Alabama.

Lampronia dumicolella, Peyerimhoff, Pet. Nouv. 1872, p. 240, Alsace.

Hyponomeuta evonymella and *longimaculella*, Chambers, *l. c.* pp. 42, 43, Kentucky (the first species renamed *orbimaculella*: id. *l. c.* p. 88).

Heribeia (?) *incertella*, id. *l. c.* p. 44, Kentucky (with notice of structural characters).

Psecadia semilugens, Zeller, *l. c.* p. 561, pl. 3. fig. 25, Texas.

Depressaria lepidella and *niviferella*, Christoph, *l. c.* pp. 19 & 20, pl. 1. figs. 16 & 17, Sarepta.

Strobisia aphroditella and *venustella*, Chambers, *l. c.* pp. 88 & 90, Kentucky.

Depressaria cryptolechiella, p. 91, *D.* (?) *dubitella* and *albisparsella*, Kentucky, *D. bistrigella*, Ontario (?), p. 92, *rileyella*, *fusciochrella*, *fuscilutella*, *obscurusella*[!], p. 106; *pseudacaciella*, p. 107, *bimaculella*, and *cercerisella*, p. 108, *pallidochrella*, p. 126, *versicolorella*, *bicostomaculella* [? *bimaculicostella*], and *querciella* [*sic*], p. 127, Chambers, *l. c.*, Kentucky (revised, pp. 128 & 129). [On the position of some of these species, *cf.* p. 147; and also p. 379 of this Record.]

Gelechia squamulella, Peyerimhoff, Ann. Soc. Ent. Fr. (5) ii. p. 15, pl. 5. fig. 7, Hyères; *G. succinctella*, p. 108, *feralella*, p. 110, *terrestrella*, p. 111, Zeller, S. E. Z. 1872, Grisons; *G. brucinella*, (larva in tamarisk-galls at) Palermo, Brussa, and Cairo; *gallincolella* (larva in tamarisk-galls at) Spalato, p. 37, *decuriella*, Raibl, p. 38, Mann, Verh. z.-b. Wien, xxii.; *G. tephrianella* and *palpiannulella* [? *annulipalpella*], p. 68, *thoraceochrella* [? *ochreithoracella*], p. 169, *obscurella*, *fuscipulvella*, *fuscimaculella*, and *quercinigrac*[*il*]*ella*, p. 170, *gris*[*e*]*ella*, *albistrigella*, *suffusella*, p. 171, *discimaculella*, *aurimaculella*, *G.* (?) *curvilinecella*, p. 172, *G. physaliella*, *quercivorella*, p. 173, *varicella*, p. 174, *G.* (?) *quinqueannulella*, p. 191, and *badiimaculella*, p. 191, *G. æquipulvella*, ibid.,

similella and *rubensella*, p. 193, *discoocellella* [*? ocellatidiscella*], p. 194, Chambers, *l. c.*, Kentucky; *G. interstratella*, Christoph, *l. c.* p. 21, pl. 1. fig. 18, Sarepta.

Evagora difficilisella[!], Chambers, *l. c.* p. 66, Kentucky. (For an amended description, referring the species provisionally to *Gelechia*, *cf.* pp. 192 & 193).

Lita schleichi, Christoph, *l. c.* p. 22, pl. 1. fig. 19, Sarepta.

Ptochenusa sublutella (Zell. MS.), *id. l. c.* p. 23, pl. 2 *a*. fig. 20, Sarepta.

Parasia griseella, p. 88, Ontario (?), *apicistrigella*, p. 66, Kentucky, Chambers, *l. c.*

Ergatis calastomella (Zell. MS.), Christoph, *l. c.* p. 24, pl. 2 *a*. fig. 21, Sarepta; *E. rogenhoferi*, Staudinger, Verh. z.-b. Wien, xxii. p. 734, Upper Engadine.

Doryphora? praticolella (Zell. MS.), Christoph, *l. c.* p. 25, pl. 2 *a*. fig. 22 Sarepta.

Hypsolophus [*Hypsil-*] *eupatoriellus*, p. 221, *reedellus* and *quercipominellus* [*sic*], p. 222, *querciellus* [*sic*], p. 223, *caryifoliellus* and *straminiellus*, p. 224, Chambers, *l. c.*, Kentucky.

Anarsia obliquistrigella, id. *l. c.* p. 65, Kentucky; *A.* (?) *saniculella*, Christoph, *l. c.* p. 27, pl. 2 *a*. fig. 23, Persia.

Pleurota sublustrella, Mann, Verh. z.-b. Wien, xxii. p. 39, Brussa; *P. dorsella* and *contignatella* (Zell. MS.), Christoph, *l. c.* pp. 28 & 29, pl. 2 *a*. figs. 24 & 25, Sarepta.

Œcophora hirticruralis (Frey, MS.), Peyerimhoff, *l. c.* p. 16, pl. 5. fig. 8, Vosges.

Gracilaria eupatoriella, *plantaginasella*[*-niella*], and 12-*lineella*, pp. 9–11, *G.* (*Coriscium*?) *albinatella* and *salicifoliella*, p. 25, *G. packardella* and *purpuriella* [*sic*], p. 27, *juglandiella*, p. 28 (the last renamed *juglandisnigrella*[!], p. 88), Kentucky, Chambers, *l. c.*; *G. inquinatella* (Zell. MS.), Christoph, *l. c.* p. 30, pl. 2 *a*. fig. 26, Sarepta.

Butalis tangerensis, Stainton, Ent. M. M. viii. p. 235, Tangier, *B. leucogaster*, Mann, *l. c.* p. 40, Sangraben; *B. ericetella*, v. Heinemann & Snellen, Tijdschr. Ent. (2) vii. p. 280, Holland.

Bucculatrix thuiella, A. S. Packard, Rep. Ins. Mass. i. p. 24. fig., Massachusetts (Rec. Am. Ent. 1871, p. 22, and Zool. Rec. viii. p. 216).

Tinagma matutinellum (=*perdicellum*, var. ?), Zeller, *l. c.* p. 117, Grisons; *T. dryadis*, Staudinger, *l. c.* p. 735, Upper Engadine.

Elachista sepulchrella, Stainton, *l. c.* p. 235, Tangier.

Coleophora uliginosella, Glitz, S. E. Z. 1872, p. 23, Hanover; *C. falcigerella*, *asperginella*, p. 31, *æqualella*, p. 32, *cartilaginella* (with notice of larva), p. 33, *delibutella*, p. 35, *serinipennella*, p. 36, *trientella*, p. 37 (Zell. MS.), Christoph, *l. c.* pl. 2 *a*. figs. 27–33, Sarepta.

Lithocolletis tangerensis, Stainton, *l. c.* p. 236, Tangiers, *L. cerisolella*, Hyères, *triflorella*, Cannes: Peyerimhoff, Ann. Soc. Ent. Fr. (5), ii. pp. 201 & 202, pl. 6. figs. 11, 11 *a* & 12, 12 *a*.

Nepticula ilicivora, Peyerimhoff, *l. c.* p. 203, pl. 6. figs. 13 & 13 *a*, Cannes; *N. potentillæ*, Hanover, Brunswick, *diversa*, p. 24, *hannoverella*, p. 25, Hanover: Glitz, *l. c.*

PTEROPHORIDÆ.

Pterophorus pergracilidactylus, p. 265, *sulphureidactylus*, and *cervinidactylus*, p. 256, spp. nn., Packard, Ann. Lyc. N. York, x.

Lioptilus trimmatodactylus (Zell. MS.), Christoph, Hor. Ent. Ross. ix. p. 38, pl. 2 *a*. fig. 34, Sarepta.

Aciptilia marptys (Zell. MS.), *id. l. c.* p. 39, pl. 2*a*. fig. 35, Sarepta.

DIPTERA

By E. C. Rye.

Loew, H. Diptera Americæ septentrionalis indigena (Centuria decima). B. E. Z. xvi. pp. 49–124.

100 new species and some new genera are characterized; the latter incidentally, at the end of specific descriptions. This "century" completes the work; and some general observations, corrections, and additions, with an index to it as a whole, are given, pp. 112–124. The genera *Triglyphus*, *Arthropeas*, *Bolbomyia*, *Synamphotera*, *Cacozenus*, *Stilpon*, and *Rhicnoessa*, founded by the author in other publications, are quoted, with proper references, at p. 113.

Pouchet, M. G. De l'influence de la lumière sur les larves de diptères privées d'organes extérieurs de la vision. R. Z. (2) xxiii. pt. 1, pp. 110–117, 129–138; pt. 2, pp. 183–186, 225–231, 261–264, 312–316, pls. 12, 13, 16, woodcuts.

From varied experiments and observations upon the eyeless larvæ of *Lucilia cæsar* and *Eristalis tenax*, the author concludes that they not only perceive light, but immediately appreciate its intensity and the direction in which it comes, that this sensibility is not by means of the antenniferous organs, and that it is only completely developed when the larvæ are full-grown. The name *actinæsthesia* is proposed for this sense. The plates are reproductions of the actual movements of the larvæ under the influence of light of various natures.

General observations: R. H. Meade, Ent. vi. pp. 251–255.

Deafness for two years in a boy caused by a fly blocking the external meatus of the ear. J. J. K. Duncanson, Scot. Nat. i. p. 212.

Dipterous parasite on *Bombyx mori*: E. Cornalia, Rend. Ist. Lomb. (2) iii. pp. 561 & 562.

Heligoland: v. Röder, B. E. Z. xvi. p. 102, names 9 species of shore-frequenting *Diptera* observed by him and not mentioned by Zetterstedt in his account of Dahlbom's collection from this island.

The Grisons: a list of species (with indications of some being new) by Zeller, S. E. Z. xxxiii. pp. 31 & 32.

Granada: v. Röder gives a list of species taken by Ribbe: *l. c.* pp. 190 & 191.

Madagascar: in Aug. Vinson's 'Voyage à Madagascar au couronnement de Radama ii.' (Paris: 1865), Annexe E, pp. 23 & 24, is a list of 62 species, by C. Coquerel.

Cecidomyiidæ.

Larvæ, dubiously referred to a *Cecidomyia*, recorded as found in mines of *Sesia tipuliformis*: J. R. S. Clifford, Ent. vi. p. 59.

Galls on *Glechoma hederaceum* caused by *Cecidomyia bursaria*: A. Müller, Ent. vi. p. 180.

Galls on *Quercus pubescens*, from the Crimea, referred to a *Cecidomyia*; and observations on galls of *C. circinans* and *C. cerris*: Gernet, Hor. Ent. Ross. viii. Bull. p. iv.

Mycetophilidæ.

T. Beling, S. E. Z. xxxiii. pp. 322–329, recapitulates instances of the appearance of swarms of the "Heerwurm" [not well to be translated by "Army-worm," a recognized term for the larvæ of an *Agrotis* in America]. It appears to be the larva of a species of *Sciara*.

Sciara thomæ: migrations of larvæ in Russia. J. Portchinsky, Hor. Ent. Ross. viii. Bull. p. xi.

Molobrus sp. 2 ♂ and 1 ♀ observed flying *in copulâ*. C. W. Dale, Ent. M. M. ix. p. 46.

Sciara atrata, p. 51, *gregaria*, p. 53, *arenaria*, p. 58: T. Beling, Verh. z.-b. Wien, xxii., Hartz, spp. nn. (notices of economy of the last two).

Rhyphidæ.

Rhyphus punctatus, F., and *R. fenestralis*, Scop.: metamorphoses and economy described fully. T. Beling, Arch. f. Nat. xxxviii. (Bd. i.) pp. 48–54.

Bibionidæ.

T. Beling (Verh. z.-b. Wien, xxii. p. 617 *et seq.*) fully describes the early stages and economy of *Bibio marci* (p. 619), *pomonæ* (p. 625), *hortulanus* (p. 626), *varipes* (p. 627), *laniger* (p. 630), *johannis* (p. 632), *albipennis* (p. 635), *ferruginatus* (p. 638), *clavipes* (p. 640), *venosus* (p. 644), and *Dilophus vulgaris* (p. 648).

Bibio marci. Laboulbène, Ann. Soc. Ent. Fr. (5) ii. p. 209, notes its appearance in large numbers in Paris, in April and May 1872, and refers to its economy. Lucas, *ibid.*, Bull. p. xliv, quotes a similar account from the journal 'La France,' in which it is referred to the *Ichneumonidæ*! On its occurring in immense abundance at Brighton, *cf.* G. D. Rowley, Ent. vi. p. 143.

Culicidæ.

Culex. C. Rondani, Bull. Ent. Ital. iv. p. 29 *et seq.*, analyzes the Italian species, with the conclusion that there are 12. Of these he gives a dichotomous table, indicating as new *C. articulatus, albipunctatus, penicillaris, pulchritarsis, pulchripalpis*, and *spathipalpis*. None of them are described, but the characters inferred from their position in the table are possibly meant to be equivalent to descriptions.

Swarmings of ♀ gnats in one room of a house at Oxford noted by J. O. Westwood, P. E. Soc. 1872, p. xxxi.

Scales of *Culex*: a general account in Ent. vi. pp. 9–11.

Tipulidæ.

Dixa venosa, sp. n., Loew, B. E. Z. xvi. p. 50, Texas.

Tipula præcisa, sp. n., *id. l. c.* p. 51, California.

Ctenophora angustipennis, sp. n., *id. ibid.*, California.

Stratiomyiidæ.

Odontomyia arcuata, p. 52, California, *plebeia*, Connecticut, *nigerrima*, Middle States, p. 53, Loew, *l. c.*, spp. nn.

Stratiomyia insignis, p. 54, California, *constans*, p. 55, Texas, *id. l. c.* spp. nn.

Clitellaria lata, sp. n., *id. l. c.* p. 55, California.

Nemotelus glaber, sp. n., *id. l. c.* p. 56, Texas.

Hermetia chrysopila, sp. n., *id. ibid.*, Texas.

Xylophagidæ.

Rhachicerus, Hal., Walk., apparently uncharacterized, has the 3rd joint of its antennæ distinctly annulated, with many more rings in the ♂ than in the ♀. Loew, *l. c.* p. 113.

Tabanidæ.

Hæmatopota pluvialis avoids any thing coloured white. J. Portchinsky, Hor. Ent. Ross. viii. Bull. p. xii.

Chrysops gigantulus, sp. n., Loew, *l. c.* p. 57, California.

Leptidæ.

Triptotricha, g. n., Loew, *l. c.* p. 59. Differs from *Leptis* in being glabrous, with a lesser thorax, wider abdomen, and 4th post. cell closed before the margin of the wing. *T. lauta*, sp. n., *id. ibid.*, California.

Atherix varicornis, sp. n., *id. l. c.* p. 58, California.

Chrysopila modesta, sp. n., *id. ibid.*, Texas.

Leptis incisa, sp. n., *id. ibid.*, California.

Therevidæ.

The specific name of *Psilocephala laticornis* being preoccupied, is changed to *platycera*: Loew, *l. c.* p. 114.

Thereva melanoneura and *fucata*, spp. nn., *id. l. c.* p. 74, California.

Xestomyza planiceps, sp. n., *id. l. c.* p. 75, California.

Acroceridæ.

Oncodes melampus, California, *eugonatus*, Texas, spp. nn., Loew, *l. c.* p. 60.

Eulonchus tristis, sp. n., *id. ibid.*, California.

Bombyliidæ.

Anthrax hottentota and pupa figured; ? parasitic on *Agrotis porphyrea*. De Roo van Westmaas, in Snellen v. Vollenhoven's continuation of Sepp's Ned. Ins. (2) ii. pl. xlii. figs. *a* & *b*, p. 195.

Aphœbantus, g. n., Loew, *l. c.* p. 77. Allied to *Argyramœba*, but with a short appendage to 3rd joint of antennæ. *A. cervinus*, sp. n., *id. l. c.* p. 76, Texas.

Leptochilus, g. n., *id. l. c.* p. 78. Differs from *Aphœbantus* in its 2nd submarginal cell not being appendiculated, more prominent face, much longer oral aperture, &c. *L. modestus*, sp. n., *id. l. c.* p. 77, Texas.

Allocotus, g. n., *id. l. c.* p. 82. Neuration somewhat as in *Sparnopolius*. *A. edwardsi*, sp. n., *id. l. c.* p. 81, California.

Bombylius semirufus, Hayti, *albicapillus*, California, spp. nn., *id. l. c.* p. 78.

Sparnopolius brevicornis, sp. n., *id. l. c.* p. 79, Texas.

Ploas atratula, ibid., *nigripennis*, *obesula*, p. 80, *id. l. c.*, California, spp. nn.

Phthiria egerminans, sp. n., *id. l. c.* p. 80, California.

Mydasidæ.

Mydas (? *Leptomydas* or *Cephalocera*) *tenuipes*, sp. n., Loew, *l. c.* p. 61, California.

Asilidæ.

Van der Wulp, Tijdschr. Ent. (2) vii. pp. 129–279, pls. 9–12, describes the known species from the East-Indian archipelago. According to him, *Laphria horrida*, Walk., ♀ = *gigas*, Macq., ♀; *L. fervens* and *sæva*, Walk., and ? *Asilus apicatus*, Walk., = *L. reinwardti*, Wied.; *L. flagrantissima* and *ardescens*, Walk., = *notabilis*, Macq.; *L. senomera*, Macq., = *alternans*, Wied.; *L. splendida*, Guér., = *Mœra spectabilis*, Guér.; *L. socia* and *consobrina*, Walk., = *M. kollari*, Dol.; *L. comes* and *consors*, Walk., *colorata*, Boisd., *pellucida*, Dol., = *M. ænea*, F.; *L. cyanea*, Macq., ? = *M. aurifacies*, Macq.; *Trypanea strenua*, Walk., = *Promachus bifasciatus*, Macq.; *Asilus perplexus*, Wied., = *Philodicus javanus*, Wied.; *Ommatius scitulus*, Walk., = *Allocotasia aurata*, F.; *O. pennus*, *coryphe*, and *androcles*, Walk., *Asilus garnoti*, Guér., = *O. fulvidus*, Wied.; *O. noctifer*, Walk., = *minor*, Dol. V. d. Wulp figures portions of *Damalis maculata*, Wied., pl. 9. fig. 5; *Laphria gigas*, Macq., figs. 11–13; *L. vulcanus*, Wied., pl. 10. fig. 2; *L. notabilis*, Macq., figs. 5 & 6; *L. obliquistriga*, Walk., fig. 7; *Mœra spectabilis*, Guér., figs. 8 & 9; *M. ænea*, fig. 10; *M. kurbinii*, Dol., fig. 11; *Promachus bifasciatus*, Macq., pl. 11. figs. 7 & 8; *Philodicus javanus*, Wied., fig. 15; *Synolcus xanthopus*, Wied., ♂, fig. 19, and pl. 12. figs. 1 & 2; *Itamus longistylus*, Wied., pl. 12. figs. 4 & 5; *Allocotasia aurata*, F., fig. 7; *Ommatius fulvidus*, Wied., fig. 12; and also figures portions (sometimes the whole insect) of several new species.

Nicocles (*Pygostolus*, Lw., *nec* Hal.) differs entirely from *Brachyrhopala*; *Dasypogon lucasi* and 4-*maculatus*, Bell., belong to *Dizonia*, *Dasyp. spathulatus*, Bell., to *Ospriocerus*; *Dasyp. magnificus*, Walk., is a *Microstylum*. Loew, *l. c.* pp. 65 & 68.

Stichopogon. Schiner, Verh. z.-b. Wien, xxii. p. 74, refers to capture by C. Koch, at Nuremburg, of individuals supposed by the latter to constitute two new species, but which are evidently considered by Schiner to be sexes of one species, the difference in coloration of the mouth-pubescence being apparently only sexual; if these eventually prove sexes of one species, the name of the ♂ is to stand (C. Koch, *ibid.*).

New genera and species:—

Taracticus, Loew, *l. c.* p. 64 (*Dasypogonides*). Anterior tibiæ spined; allied to *Dioctria*. Type *D. 8-punctata*, Say.

Blax, id. *l. c.* p. 65 (*Dasypogonides*). Allied to *Taracticus* and *Nicocles*. *B. bellus*, id. *l. c.* p. 63, Texas.

Callinicus, id. *l. c.* p. 71 (*Dasypogonides*). Resembles *Diogmites*, but with spurless anterior tibiæ. *C. calcaneus*, id. *l. c.* p. 70, California.

Dioctria resplendens, id. *l. c.* p. 62, California.

Echthopoda formosa, id. *ibid.*, Pennsylvania.

Leptogaster brevicornis, id. *ibid.*, Texas; *L. vitiosus*, p. 137, pl. 9. fig. 1, *macilentus*, p. 139, Java, *habilis*, p. 138, fig. 2, *hirticollis*, p. 139, fig. 3, Timor, *levis*, p. 140, Sumatra, v. d. Wulp, *l. c.*

Heteropogon phœnicurus, p. 71, *lautus*, p. 72, Loew, *l. c.*, Texas.

Stenopogon breviusculus, p. 68, *univittatus*, *obscuriventris*, *gratus*, p. 69, *id. l. c.*, California.

Damalis marginata, p. 142, pl. 9. fig. 4, *major*, p. 143, Borneo; *nigella*, p. 143, Bel Menado; *pallida*, p. 145, Borneo and Sumatra: v. d. Wulp, *l. c.*

Discocephala hirsuta, id. *l. c.* p. 146, Sumatra; *D. calva*, Loew, *l. c.* p. 73, Texas.

Stichopogon albicapillus, v. d. Wulp, *l. c.* p. 147, Java; *S. schineri*, ♂, p. 79, and *arenivagus*, ♀, p. 80, C. Koch, Verh. z.-b. Wien, xxii., Nuremberg.

Habropogon jucundus, v. d. Wulp, *l. c.* p. 148, pl. 9. fig. 6, Java.

Xiphocerus complacitus, id. *l. c.* p. 150, pl. 9. figs. 7 & 8, Waigiou.

Pygostolus æmulator, Loew, *l. c.* p. 66, California.

Diogmites symmachus, id. *ibid.*, Texas.

Microstylum morosum, id. *l. c.* p. 67, Texas.

Hyperechia fera, v. d. Wulp, *l. c.* p. 155, pl. 9. fig. 9, Borneo.

Pogonosoma stigmaticum, p.157, Sumatra; *semifuscum*, p. 158, pl. 9. fig. 10, Batchian: *id. l. c.*

Laphria terminalis, p. 169, pl. 10. fig. 1, Celebes; *blumii*, Java and Sumatra; *pernigra*, Zuid-Halmaheira, p. 170; *auricincta*, p. 171, Timor; *definita*, p. 172, *ferruginosa*, p. 185, Ceram; *ignobilis*, p. 173, *gravipes*, p. 175, *aureola*, p. 180, *tricolor*, p. 181, pl. 10. figs. 3 & 4, Java; *muelleri*, p. 174, Borneo; *bernsteini*, p. 175, Batchian; *solita*, p. 178, Java and Timor; *histrionica*, p. 179, *signatipes*, p. 191, Sumatra; *futilis*, p. 183, Borneo and Sumatra; *amabilis*, p. 186, Gebeh; *rubidifasciata*, p. 188, Waigiou; *soror*, p. 190, Zuid-Halmaheira, Waigiou, Ceram (?=*dissimilis*, Dolesch.); *nigricærulea*, p. 194, New Guinea: *id. l. c.*

Mœra tomentosa, p. 202, Aru and Salawatti; *occulta*, p. 205, pl. 10. fig. 12, Salawatti, Waigiou, New Guinea; *albifacies*, p. 207, Celebes; *nyc[h]themera*, p. 208, pl. 11. fig. 1, Java, Pagowat, Celebes; *nigrithorax*, p. 210, Aru; *tuberculata*, p. 211, pl. 11. fig. 2, Java and Borneo; *hispidella*, p. 213, Java, &c.: *id. l. c.*

Atomosia conspicua, id. *l. c.* p. 214, pl. 11. figs. 5 & 6, Waigiou.

Promachus melampygus, p. 223, *leucopareus*, p. 227, pl. 11. figs. 10 & 11, Java; *xanthostoma*, p. 225, pl. 11. fig. 9, Salawatti; *albicauda*, p. 228, pl. 11. figs. 12–14, Celebes (?=*Trypanea varipes*, Macq.), *inornatus* and *felinus*, p. 250, Borneo: *id. l. c.*

Eccoptopus impiger, id. *l. c.* p. 234, pl. 11. figs. 16–18, Celebes.

Pamponerus nigritulus, id. *l. c.* p. 235, Halmaheira &c. (?=*Asilus atratulus*, Wlk.).

Philonicus longulus, id. *l. c.* p. 237, Celebes.

Antipalus wieneckii, id. *l. c.* p. 238, Timor, Java.

Mochtherus lautus, p. 242, New Guinea, *gnavus*, p. 243, pl. 12. fig. 3, Java, Obi, &c., *patruelis*, p. 244, Java, Bel Menado: *id. l. c.*

Itamus dentipes, id. *l. c.* p. 248, pl. 12. fig. 6, Salawatti.

Allocotasia triangulum, id. *l. c.* p. 251, pl. 12. fig. 8, Java.

Emphysomera peregrina, id. *l. c.* p. 253, pl. 12. figs. 9–11, Borneo, Ternate, Sumatra.

Ommatius concinens (? = *Dasypogon flavescens*, F., var.), p. 260, Timor, *dilatipennis*, p. 261, pl. 12. figs. 13 & 14, *despectus*, p. 268, *argyrochirus*, p. 270, *insularis*, p. 272, *pinguis*, p. 275, Java, *excurrens*, p. 263, pl. 12. fig. 15, Morotai, *fulvimanus*, p. 264, Obi, *spinibarbis*, p. 265, pl. 12. fig. 16, Halmaheira, Borneo, Ternate, *aruensis*, p. 269, pl. 12. fig. 17, Aru, *impeditus*, p. 270, Borneo, *suffusus*, p. 271, Sangir, *infirmus*, p. 273, Gilolo, Ternate, Morotai, *serenus*, p. 274, Waigiou, *rubicundus*, p. 276, Java, Borneo, Sumatra: *id. l. c.*

EMPIDÆ.

The specific name of *Rhamphomyia lugens*, being preoccupied, is changed to *luctuosa*: Loew, *l. c.* p. 114. *R. latipennis*, Meig., corroborated as ♂ of *R. platyptera*, Pz.: Schiner, Verh. z.-b. Wien, xxii. p. 74.

Empis stercorea. G. H. Verrall, Ent. M. M. viii. p. 281, describes the British species allied to this, reviving the prior name *scutellata* of Curtis for *E. parvula*, Egger.

Empis concolor, sp. n., Verrall, *l. c.* p. 283, Scotland.

Drapetis gilvipes, p. 89, *divergens*, p. 90, spp. nn.: Loew, *l. c.*, Texas.

DOLICHOPODIDÆ.

G. H. Verrall, Ent. M. M. ix. p. 71, publishes a revised synonymic list of the British species (154 spp., 34 gg.), of which 17 are recorded as indigenous for the first time.

Xanthochlorus (? *tenellus*, Wied.). A. Müller, Ent. M. M. ix. p. 45, notes a fungoid epidemic occurring in this species.

Paraclius pumilio, sp. n., Loew, *l. c.* p. 90, Texas.

Pelastoneurus furcifer, sp. n., *id. ibid.*, Texas.

Hydrophorus cerutias, sp. n., *id. ibid.*, Texas.

SYRPHIDÆ.

Eristalis tenax attracted by painted flowers: A. Müller, Ent. M. M. viii. p. 273.

Syrphus laziophthalmus: an example with tibia and tarsus malformed, having apparently been broken and badly united during life, referred to by G. H. Verrall, P. E. Soc. 1872, p. xxi.

(?) *Chilosia chalybeata*, Meig., described in all its stages; bred from stems of *Sonchus oleraceus*. J. Hardy, Scot. Nat. i. pp. 177–180.

Spilomyia longicornis, sp. n., Loew, *l. c.* p. 82, N. America.

Brachypalpus frontosus, Columbia, and *B.* (? g. n.) *cyanogaster*, Pennsylvania, spp. nn.: *id. l. c.* p. 83.

Myiolepta nigra, Pennsylvania, *ærea*, Illinois, p. 84, *strigilata*, p. 85, Texas: *id. l. c.*, spp. nn.

Helophilus polygrammus, sp. n., *id. l. c.* p. 85, California.

Microdon baliopterus, sp. n., *id. l. c.* p. 86, Texas.

Ceria tridens, sp. n., *id. ibid.*, California.

PIPUNCULIDÆ.

Pipunculus subvirescens, p. 87, *fasciatus*, p. 88, Texas: Loew, *l. c.*, spp. nn.

Muscidæ.

A. Müller, Ent. M. M. viii. p. 181, describes puparia, dubiously referred to the *Muscidæ*, found in gall-like nidi on fronds of *Athyrium filix-fœmina*.

Schiner, Verh. z.-b. Wien, xxii. p. 74, records capture of rare species of *Tachinides* by Koch at Nuremberg.

Triptocera exoleta, Meig., parasitic on *Polia flavicincta* (*Lepidopt.*), *Tricholyga properans*, Rond. (*Tachina festinans*, Meig., ♀, *diluta*, Meig., *rufiscutellata*, Macq., ♂), on *Liparis chrysorhœa* and *aurifiua* (*Lep.*), *Cyrthophlæba* (*Plagia*) *ruricola*, Meig., on *Spintherops spectrum* (*Lep.*), *Masicera girovaga*, Rond., MS., on *Lophyrus rufus* (*Hym.*): Rondani, Bull. Ent. Ital. iv. p. 210 *et seq.*

Tachina (*Masicera*) *anonyma*. C. V. Riley, iv. Rep. Ins. Mo. p. 129, refers under this name to an undescribed species bred by him from *Attacus polyphemus*, *Citheronia regalis*, *Prodenia autumnalis*, *Noctua* sp., *Cynthia cardui*, *Heliothis armigera*, *Datana ministra*, *Danais archippus*, and ? var. from *Sphinx carolina* (all *Lepidopt.*).

Tachina beelzebul and *diabolus*: affinities with *Megistogaster fuscipennis*, Mcq., = *Cordyligaster petiolata*, Wied., discussed: they should form a new genus: v. d. Wulp, Tijdschr. Ent. (2) vii. p. lviii.

Degeeria seria, Meig., parasitic on larvæ of *Ctenophora ruficornis* and *pectinicornis* (*Dipt.*): Weyenburgh, *ibid.*

Exorista leucaniæ, Kirk, var. *cecropiæ*, Riley, parasitic on *Attacus cecropia* (*Lep.*): economy described, Riley, *l. c.* p. 108.

Cynomyia mortuorum, F., breeds in corpses of any vertebrate animal; its economy referred to: J. Portchinsky, Hor. Ent. Ross. viii. Bull. p. xxii.

Lucilia hominivorax ?: death to human beings in Peru caused by larvæ of a fly proceeding from eggs laid in the nose: Jelski, Pet. Nouv. No. 65, p. 200.

Anthomyia spreta, Mg. Economy recorded by Giraud, Ann. Soc. Ent. Fr. (5) ii. p. 502 *et seq.* It lives in *Sphæria typhina*, Dec., a fungoid growth in *Holcus* and other grasses.

Anthomyia [surely *Tachina*] *larvarum* bred from cocoons of *Saturnia carpini*: W. D. Roebuck, Ent. vi. p. 182.

Schænomyza shows affinities to many families, and is placed in the *Anthomyides* provisionally: Loew, B. E. Z. xvi. p. 96.

The specific name of *Phytomyza ilicis*, being preoccupied, is changed to *ilicifolia*: id. *l. c.* p. 114.

Leucopis obscura, Hal., parasitic on *Chermes* (*Adelges*) *piceæ* and *corticalis* (*Rhynch.*): economy &c. described: J. Hardy, Scot. Nat. i. pp. 256–258.

Trigonometopus, Mcq., usually associated with the *Cordylurides*, should possibly be placed in the *Heteroneurides*: Loew, *l. c.* p. 114.

Schiner, Verh. z.-b. Wien, xxii. p. 75, notes the occurrence of 5 examples of *Chelifer hahni*, Koch, on the hind legs of a living specimen of *Chloria demandata*.

Ceratitis hispanica occurs in Algeria, *C. citriperda* in the island of Bourbon and the Azores. Pet. Nouv. no. 43, p. 171.

Urophora solstitialis, L., bred from galls in flower-heads of *Serratula tinctoria*: E. A. Fitch, Ent. vi. p. 142.

Chlorops. Schiner, Verh. z.-b. Wien, xxii. pp. 61–73, discusses at great length

the confusion in nomenclature of certain members of this genus, which he attributes to one species, redescribed and renamed (p. 70) *copiosa*, and to which he refers his own *C. hypostigma, circumdata, notata,* and *lineata, Chloropisca ornata*, Lw., *Oscinis circumdata* and *notata*, Zett., and (dubiously) *Chlorops hypostigma, notata, circumdata*, and *ornata*, Meig., as synonyms. He recapitulates recorded instances of swarms of this insect, and refers generally to the difficulty of correctly determining members of the group.

Phortica, Schiner, = *Amiota*, Lw.: Loew, *l. c.* p. 112.

Blepharoptera sp.: larvæ and pupæ swarm in bat-excreta, in a cave of the Ariége: Abeille, Étud. Col. Cav. p. 12.

Diplocentra, Lw., = *Cyrtonotum*, Macq. (*nec* Steph.): Loew, *l. c.* p. 112.

Opetiophara, g. n., *id. l. c.* p. 106. *Chloropides.* Agrees somewhat with *Lipara*, but with last abdominal segment of ♀ prolonged into a horny subulate terebra. *O. straminea*, sp. n., *id. l. c.* p. 105, Texas.

New species:—

Tachina (*Exorista*) *phycitæ* (Le Baron, MS.), Riley, iv. Rep. Ins. Mo. p. 40, bred from *Phycita nebulo*, Walsh (*Lep.*).

Gymnosoma filiolæ, Loew, *l. c.* p. 92, Texas.

Blepharopeza adusta, id. *ibid.*, California (from larvæ of *Spilosoma ærea*).

Anthomyia sonchi, p. 209, from *Sonchus oleraceus*, and *A. jacobeæ*, p. 254, from *Senecio*, Scotland: J. Hardy, Scot. Nat. i.

Homalomyia tetracantha, Loew, *l. c.* p. 93, Middle States.

Cœnosia nivea, calopyga, p. 95, Pennsylvania, *modesta*, p. 96, Washington: *id. l. c.*

Schœnomyza dorsalis, id. *l. c.* p. 95, Columbia.

Cordylura vittipes, lutea, p. 96, Sitka, *fulvibarba*, p. 97, Hudson's Bay Territory, *capillata*, p. 88, New Hampshire: *id. l. c.*

Phytomyza hepaticæ, Frauenfeld, Verh. z.-b. Wien, xxii. p. 396, bred from *Hepatica triloba*, Vienna.

Leucopis palumbii, Rondani, Bull. Ent. Ital. iv. p. 213, parasitic on *Pemphigus utricularius*, Pass. (*Aphid.*), Italy.

Sapromyza macula, Loew, *l. c.* p. 101, Texas.

Lauxania eucephala, id. *ibid.*, Texas.

Hippelates pusio, p. 103, *eulophus*, p. 104, id. *l. c.*, Texas.

Crassiseta eunota, id. *l. c.* p. 104, Texas.

Chlorops (*Centor*) *procera*, p. 106, Connecticut, *C.* (*Diplotoxa*) *gundlachi*, Cuba, and *confluens*, p. 107, *microcera, pulchripes*, p. 108, *alternata*, p. 109, *nigricans*, p. 110, *C.* (*Anthracophaga*) *maculosa* and *Chlorops mellea*, p. 111, Texas: *id. l. c.*

Siphonella latifrons, id. *l. c.* p. 106, Texas.

Notiphila pulchrifrons, id. *l. c.* p. 102, Texas.

Drosophila obesa, p. 102, *sigmoides*, p. 103, Texas: *id. l. c.*

Sciomyza tenuipes, p. 99, Middle States, *trabeculata*, p. 100, Texas: *id. l. c.*

Blepharoptera discolor, New Hampshire, *pectinata*, Texas: *id. l. c.* p. 99.

ŒSTRIDÆ.

For observations on a fly developed in the skin of man at Senegal, termed "Ver de Cayor" by Bérenger-Féraud, and wrongly referred to *Ochromyia* (*anthropophaga*, MS.) by Blanchard, *cf.* Guérin-Méneville, R. Z. (2) xxiii. p. 491.

Œstrus equi: larvæ commonly extracted from the intestinal meatus of horses by *Monedula turium* in Russia. J. Portchinsky, Hor. Ent. Ross. viii. Bull. p. xi.

(APHANIPTERA.)

PULICIDÆ.

Pulex. C. Ritsema, Alb. Nat. xi. (1872), p. 65 *et seq.*, figures (woodcuts) and minutely describes the metamorphosis and habits of *P. irritans*.

Pulex felis, Bouché. Metamorphosis described and figured: Laboulbène, Ann. Soc. Ent. Fr. (5) ii. pp. 267–274, pl. xiii.

PLATYPSYLLIDÆ.

Platypsylla. Leconte, P. Z. S. 1872, pp. 799–804, pl. lxviii., describes the single known species very minutely, in all the salient features of its external anatomy. He considers it should form the type of a family, *Platypsyllidæ*, which he places in the *Coleoptera*, between the *Hydrophilidæ* and a family *Leptinidæ* (erected by himself in 1866 for the reception of *Leptinus*), but with a strong tendency to the *Trichopterygidæ* and *Corylophidæ*. Various portions of the insect are figured. The author repeats this opinion in P. E. Soc. 1872, p. xxviii, considering *P. castoris* to be rather an inquiline than a true parasite, living probably on epidermal scales. Westwood, *ibid.*, demurs to the insect being considered Coleopterous.

NEUROPTERA

By R. M'LACHLAN, F.L.S.

M'LACHLAN, R. Notes on the *Neuroptera* of Siberia and European Russia. Nachr. Ges. Mosc. (1872). Translated into the Russian language from the Recorder's MS., with Latin diagnoses of some new spp.

Consists chiefly of notes on a collection of Russian *Neuroptera*. An extract, under the title 'Notes sur quelques espèces de Phryganides, et sur une *Chrysopa*,' appears (in French) in Bull. Mosc. 1872, pt. 3, pp. 187–194.

SELYS-LONGCHAMPS, E. DE, and M'LACHLAN, R. Matériaux pour une faune Névroptérologique de l'Asie septentrionale. Ann. Ent. Belg. xv. pp. 25–77, pls. i., ii.

The *Odonata* are by De Selys, the *Non-Odonata* by the Recorder. They enumerate about 110 spp. as now known from Asia north of the parallel of 50° of latitude. Of these 43 are *Odonata* and 67 *Non-Odonata*. 77 also occur within the limits of Europe, and 49 in the British Isles. The aspect of the fauna is decidedly European, with occasional North American and Exotic elements.

In Ann. Sc. Géol. ii. is a memoir by OUSTALET (see *antè*, p. 224) on the fossil insects of the tertiary formations of France, in which a larva is described and figured as *Libellula minuscula*; the impression of a wing as *Ascalaphus edwardsi* (which the Recorder thinks was no *Ascalaphus*), and

certain forms of the cases of *Trichoptera* from the indusial limestone at Chavroches are noted as *Phryganea gerandiana*.

The Recorder, Ent. M. M. ix. pp. 99–104, 168–176, has commenced a series of articles as "Instructions for the Collection and Preservation of Neuropterous Insects."

TRICHOPTERA.

Limnophilidæ.

M'Lachlan notices the occurrence of a species of this family, apparently a *Limnophilus*, in the Falkland Islands, the group being almost confined to the northern hemisphere. Ent. M. M. viii. p. 273.

Stenophylax dubius, Stephens. For notes respecting the occurrence near Moscow of a second example of this, hitherto only known from the British type specimen, see M'Lachlan, Nach. Ges. Mosc. 1872, and Bull. Mosc. 1872, pt. 3, p. 188.

Thamastes dipterus, Hagen. Copies of Hagen's drawings of this species given by M'Lachlan in Ann. Ent. Belg. xv. pl. ii. fig. 2.

Radema infernale, Hagen (name hitherto only noticed), *id. l. c.* p. 65, pl. ii. fig. 3 (details), Siberia.

Glyphotælius mutatus, sp. n., McLachlan, *l. c.* p. 60, pl. i. fig. 12 (details), Siberia.

Limnophilus abstrusus, sp. n., *id. l. c.* p. 62, pl. i. fig. 13 (details), Siberia.

Stenophylax palatus, sp. n., *id. l. c.* p. 63, pl. i. fig. 14 (details), Siberia.

Platyphylax nigrivittatus, sp. n., *id. l. c.* p. 64, pl. ii. fig. 1 (details), Siberia.

Apatania majuscula, sp. n., *id. l. c.* p. 66, pl. ii. fig. 4 (details), Siberia.

Sericostomatidæ.

Brachycentrus. M'Lachlan records that W. C. Boyd has reared young larvæ from the egg, and that they manufactured decidedly quadrangular cases, but died when very young, so that no opportunity was afforded of completing the investigation. Ent. M. M. ix. p. 166.

Leptoceridæ.

Mystacida trifasciata, Thevenet,=*Setodes interrupta*, F. (M'Lachlan, Ann. Soc. Ent. Fr. (5) ii. p. 18). (*Cf.* Zool. Rec. viii. p. 400.)

Molanna submarginalis, sp. n., M'Lachlan, Nachr. Ges. Mosc. 1872, and Bull. Mosc. 1872, pt. 3. p. 188 (woodcuts), Wologda.

Molannodes steini, sp. n., *id. ibid.* p. 191, Silesia and Finland.

Hydropsychidæ.

Hydropsyche albifasciata, sp. n., *id.* Ann. Ent. Belg. xv. p. 68, pl. ii. fig. 6, Amur Land.

Macronema radiatum, sp. n., *id. l. c.* p. 67, pl. ii. fig. 5, Siberia and Amur Land.

Œstropsidæ.

Amphipsyche, g. n., *id. l. c.* p. 68. With evidently articulated palpi. Spurs 1.4.4; no discoidal cell. The presence of articulated palpi throws doubt on the validity of this family as distinct from *Hydropsychidæ*. *A. proluta*, sp. n., *id. l. c.* p. 70, pl. ii. fig. 7 (details), Amur Land.

Hydroptilidæ.

A. E. Eaton has determined 9 British species and 5 genera. Ent. M. M. ix. p. 120.

Neuroptera Planipennia.

Sialis sibirica, sp. n., M'Lachlan, Ann. Ent. Belg. xv. p. 55, pl. i. fig. 10 (details), Siberia.

An analysis of the Recorder's recent work on the *Ascalaphidæ* (*cf.* Zool. Rec. viii. p. 401) is given by De Selys-Longchamps in CR. Ent. Belg. 1872, pp. xxxiv–xxxvi.

Sisyra dalii occurs in abundance near Reigate (England). R. M'Lachlan, Ent. M. M. ix. p. 62.

Hemerobius inconspicuus occurs at Rannoch (Scotland): *id. ibid.* p. 88.

Chrysopa septempunctata. An account of the mode of oviposition and of the newly hatched larva is given by A. Müller, *ibid.* pp. 60 & 88.

Chrysopa dasyptera, sp. n., McLachlan, Nachr. Ges. Mosc. and Bull. Mosc. 1872, pt. 3, p. 193, South Russia and Samarcand.

Panorpa amurensis, sp. n., *id.* Ann. Ent. Belg. xv. p. 59, pl. i. fig. 11, Amur Land.

Pseudo-Neuroptera.

Thysanura.

Iapyx solifugus, Haliday. Lucas notices its discovery in Burgundy, and discusses the homology of the abdominal segments after the opinions of Haliday, Meinert, and Humbert. Bull. Soc. Ent. Fr. (5) ii. p. lxxi.

Thysanoptera.

Thrips. A. Müller notices damage to framed engravings caused by the insects getting between the paper and the glass. Ent. M. M. ix. p. 13.

Thrips frumentarius, sp. n., T. Beling, Verh. z.-b. Wien, xxii. pp. 651–654, injurious to corn crops in the Harz. Its habits, larva, &c. are noticed at length.

Psocidæ.

Clothilla inquilina. Ritsema (Alb. Nat. 1872, p. 255) notes an instance recorded in Arch. path. Anat. 1871, p. 283, of immense numbers of this insect (so determined by Gerstäcker) appearing suddenly in an old house in August.

Psocus longicornis, F., occurs in North India according to M'Lachlan. *P. cosmopterus*, M'Lach., = *P. taprobanes*, Hag., Ent. M. M. ix. p. 76. *P. palliatus*, Hag., allied in some respects to *Amphipsocus*, probably forms the type of another genus: *id. l. c.* p. 77. *P. roseus*, Hag., is an *Epipsocus*: *id. l. c.* p. 78.

Stenopsocus stigmaticus (redescribed) occurs in Britain: *id. l. c.* p. 63.

Amphipsocus, g. n., *id. ibid.* p. 76. Allied to *Cœcilius*; but the pterostigma emits an abbreviated veinlet. *A. pilosus*, sp. n., *id. l. c.* p. 77 (fore-wing figured), North India.

Psyllipsocus, g. n., Selys-Longchamps, *ibid.* p. 145. Allied to *Cœcilius*, but with a supplementary nervure to the inner margin near the base. Type

Psocus pedicularis, Rambur (*nec* L.), renamed *ramburi*, p. 146 (fore-wing figured).

Hemipsocus, g. n., *id. l. c.* p. 146. Allied to *Psocus* (restricted), but with only 3 cellules on the inner margin. Type *P. chloroticus*, Hag. (fore-wing figured).

Psocus 5-*punctatus* and *clarus*, Ceylon, *malayanus*, Sula: M'Lachlan, *l. c.* p. 75, spp. nn.

Cœcilius pictipennis, sp. n., *id. l. c.* p. 76, Ceylon.

Perlidæ.

Pteronarcys reticulata, Burm. M'Lachlan redescribes this insect, and figures the abdominal characters of ♂ ♀. Ann. Ent. Belg. xv. p. 51, pl. i. figs. 2 & 3.

Dictyopteryx dichroa, id. *l. c.* p. 52, pl. i. figs. 4 & 5, and *D. compacta*, *l. c.* pl. i. figs. 6 & 7, Siberia: spp. nn.

Perla flavitincta, id. *l. c.* p. 54, pl. i. fig. 9, and *P. exilis*, *l. c.* pl. i. fig. 8, Siberia: spp. nn.

Ephemeridæ.

Joly, N. & E. Études sur le prétendu Crustacé au sujet duquel Latreille a crée le genre *Prosopistoma*, et qui n'est autre qu'un véritable insecte hexapode. Ann. Sci. Nat. (5) xvi. no. 7, pp. 1–16, pl. 3.

This very important article contains an amplification of the views already promulgated by E. Joly (*cf.* Zool. Rec. viii. p. 406), that Latreille's supposed genus of branchiopod *Crustacea*, termed *Prosopistoma*, is the immature condition of an insect pertaining to this family. The fact that the animals breathe by means of tracheæ is almost conclusive evidence that they are true insects; but it is difficult to imagine what the imago can be like; for no European species yet discovered offers any analogy in the enormous thoracic development. *Prosopistoma* had never been thoroughly accepted by crustaceologists; and it now rests with entomologists to follow up the clue given by the authors of the above-quoted article, and, which ought not to be difficult, to *prove* the position they assign to the genus with so much show of probability.

Westwood, Proc. Ent. Soc. 1872, p. vi, remarks on types of *Prosopistoma* rom Madagascar.

Palingenia sibirica, sp. n., M'Lachlan, Ann. Ent. Belg. xv. p. 50, pl. i. fig. 1 (details), Siberia.

Odonata.

Cabot, Louis. The immature state of the *Odonata*. Part i. Subfamily *Gomphina*. Illust. Cat. Harvard College, no. 5, pp. 1–17, pls. i.–iii.

Selys-Longchamps, E. de. Note sur plusieurs Odonates de Madagascar et des îles Mascareignes. R. Z. 1872, pp. 175–182.

Attention is called in P. E. Soc. 1872, p. xxv, to the fact that *Merops persicus* is known to line its nest with the wings of dragonflies.

Libellulina.

Libellula lycoris, p. 176, Madagascar or Mauritius, *assignata*, p. 177, Madagascar: Selys, *l. c.*, spp. nn.

Gomphina. Cabot, *l. c.*, has published (with Hagen's assistance) a memoir on the immature state of 17 species of this tribe; but only 4 are referred to their respective genera without doubt, the others not having been bred. The plates (beautifully executed) are supposed to illustrate the following genera:—*Gomphus*, *Herpetogomphus*, *Macrogomphus*, *Progomphus*, *Gomphoides*, *Hagenius*, *Ictinus*, and *Cordulegaster*.

Onychogomphus ruptus is redescribed by Selys from perfect specimens. Ann. Ent. Belg. xv. p. 29, pl. ii. fig. 12 (details).

Gomphus epophthalmus, p. 31, pl. ii. fig. 13 (details), and *maacki*, p. 33, pl. ii. fig. 14 (details), Irkutzk: *id. l. c.*, spp. nn.

Æschnina.

Anax goliath, sp. n., Selys, R. Z. 1872, p. 178, Madagascar.

Æschna arundinacea, sp. n., *id.* Ann. Ent. Belg. xv. p. 36, Irkutzk.

Agrionina.

Agrion concinnum, Johanson, is redescribed from Siberian examples by Selys, Ann. Ent. Belg. xv. p. 40, pl. ii. fig. 8 (details).

Agrion glaciale (Hagen), p. 41, pl. ii. fig. 9 (details), *lanceolatum*, p. 43, pl. ii. fig. 10 (details), *ecornutum* (? race of *mercuriale*), p. 44, pl. ii. fig. 11 (details), Siberia; *hermeticum* (? race of *mercuriale*), p. 45, Algeria, *id. l. c.*; *A.* (?) *insulare*, p. 179, Mauritius and Bourbon; *mauritianum*, p. 180, Mauritius, Selys, R. Z. 1872: spp. nn.

Agriocnemis solitaria, p. 181, Rodrigues, *A.* (?) *exilis*, p. 182, Madagascar or Mauritius: *id.* R. Z. 1872, spp. nn.

Psilocnemis alatipes, sp. n., M'Lachlan, Ent. M. M. ix. p. 1 (leg figured), Madagascar.

ORTHOPTERA

By R. M'Lachlan, F.L.S.

Fischer, L. H. Ueber Vitus Graber's Mittheilungen der Aehnlichkeit der Geschlechtsorgane bei Orthopteren. Verh. z.-b. Wien, xxii. pp. 77, 78.

Glover, Townend. Illustrations of North-American Entomology: *Orthoptera*. Washington, 1872. 4to.

Consists of 13 crowded coloured plates by the author, with explanatory letterpress. The edition is stated to be limited to 50 copies only. Although scarcely a scientific work, it may be found of great use to beginners, the figures appearing to be sufficiently accurate for the identification of species,

though there is an unfortunate absence of details of special structures. On some of the plates are included species of *Thysanura*, *Thysanoptera*, and *Mallophaga*, concerning which the author states that "they may be left out altogether, or removed into other orders if found desirable," according to individual fancy. In all, about 220 species are figured, in many cases from type specimens.

SAUSSURE, H. DE. Mémoires pour servir à l'Histoire Naturelle de Mexique, des Antilles, et des États-Unis: Synopsis des Mantides Américains. Genève, 1871, pp. 184, 2 pl. 4to.

Forms t. ii. 1re partie, of the entire work.

——. Mission Scientifique au Mexique et dans l'Amérique Centrale. Ouvrage publié par l'ordre de l'Empéreur, et par les soins du Ministre de l'Instruction publique. Recherches Zoologiques. 6me partie: Études sur les Insectes Orthoptères. 1e livraison, 1870, pp. 132, 4 pl.; 2e livraison, 1872, pp. 133–292, 2 pl. Folio.

The completion of the magnificent work of which these form portions has been delayed by the political events of the last few years. The Recorder has seen only the first livraison, and is indebted to the courtesy of the author for information concerning both it and the second.

——. Mélanges Orthoptérologiques. Fasc. iv. Mantides et Blattides. Genève et Bâle: 1872, pp. 160, 3 pl. 4to.

Supplementary to previous fascicules of the 'Mélanges,' published as a separate work in 1872, but will appear also in the Mém. Soc. Phys. Genèv. 1873.

THOMAS, C. Notes on the Saltatorial *Orthoptera* of the Rocky Mountain regions. Hayden's Preliminary Report on the U. S. Geolog. Survey of Montana, &c., pp. 423–466, pls. i., ii.

An important article, giving the results of an examination of the materials collected by the author during the expedition. 101 species (including many new) are noticed as occurring west of Iowa, Missouri, and Arkansas. The introductory portion is occupied by a demonstration of the author's views concerning the classification &c. of the order as a whole, with critical remarks on Packard's arrangement, especially in regard to the Darwinian theory. He considers Fieber's classification the best. The figures are copied from Glover's work noticed above.

WALKER gives a list of 26 species of this order found in America "north of the United States." Canad. Ent. iv. p. 30.

L. VON HEYDEN notices 10 known species collected by Noll and Grenacher in the island of Teneriffe. Ber. senck. Ges. 1872, pp. 83–85.

THOMAS, in Hayden's Geological Survey of Wyoming (1871), pp. 265–284, gives a list of 38 species collected by him during the expedition, with notes on synonymy and descriptions of new species.

Blattidæ.

The notices under this heading consist entirely of extracts from the works of H. de Saussure.

In the 'Mission Scientifique au Mexique,' &c., livr. i., he gives generalities on the structure of the abdomen and of the organs of flight, and a synonymic table of the nomenclature of the parts of the wing. The subject is treated in a comparative manner with respect to the author's previous works, and the system laid down by Brunner v. Wattenwyl. There are also numerous modifications of classification, many species redescribed, and beautifully executed coloured plates. Two new genera are established:—

Paraloboptera, p. 86. As in *Loboptera*, but the tarsi without arolia.

Paraletindia, p. 111. Formed to receive *Letindia azteca*.

In the 'Mélanges Orthoptérologiques,' fasc. iv. pp. 91–154, he describes many new species, previously unknown sexes, and other species previously described but hitherto unknown to him. The following are the new species:—

Temnopteryx kaupiana, p. 92, Mexico?; *abyssinica*, p. 93, Abyssinia.

Blatta (*Phyllodromia*) *munzigeri*, p. 94, interior of Africa; *albovittata*, p. 95, New Holland.

Pseudophyllodromia obscura, p. 98, and *lineolata*, p. 99, Brazil; *maximiliani*, p. 100, fig. 35, Mexico.

Ischnoptera ocularis, p. 103, Cayenne; *ectobioides*, p. 104, South China.

Nyctobora intermedia, p. 105, Brazil.

Platyzosteria liturata, p. 108, fig. 36, New Georgia; *bifida* (Brunner), p. 110, fig. 37, Queensland; *finschiana*, p. 111, Cuba.

Periplaneta borrii, p. 113, fig. 38, Java.

Deropeltis antennata, p. 116, fig. 39, South Africa?; *longipennis*, p. 117, Caffraria.

Archiblatta valvularia, p. 118, fig. 40, Java.

Glyptopeltis, g. n., p. 119. Allied to *Archiblatta*. *G. biguttata*, p. 122, fig. 41, Java; *couloniana*, p. 124, fig. 42, Java?

Thorax punctata, p. 125, Brazil.

Epilampra deflexa, p. 126, fig. 43, *borrei*, p. 127, fig. 44, *lævicollis*, p. 129, fig. 45, Java; *quadrata*, p. 129, China and Java.

Chorisoneura pectinata, p. 131, New Holland.

Panchlora tolteca, p. 131, Mexico; *grandis*, p. 132, fig. 46, Sierra Leone.

Nauphœta guineensis, p. 133, fig. 47, Guinea.

Perisphœria pubescens, p. 136, Natal.

Derocalymma virescens (Brunner), p. 138, figs. 48, 49, South Africa; *carinata*, p. 139, fig. 50, Natal; *contigua*, p. 140, fig. 51, New Guinea; *clypeata*, p. 142, fig. 52, Java; *reflexa*, p. 143, Cape?

Paraphormetica punctata, p. 145, Brazil; *obscura*, p. 146, Java.

Panesthia kraussiana, p. 150, Melbourne; *lævicollis*, p. 151, New Holland; *ornata*, p. 152, fig. 54, Java, China?

Paranauphœta javanica, p. 153, Java.

Mantidæ.

Also nearly entirely occupied by the works of De Saussure.

In the "Mission Scientifique au Mexique," livr. ii., he gives notes on habits,

development, mimicry in those species that inhabit sands and deserts, principles of classification, &c. The new species are:—

Thespis vicina, Colombia.

Epaphrodita dentifrons, Antilles.

The 'Mémoires pour servir à l'Histoire Naturelle de Mexique,' &c., t. ii. 1re partie, are entirely occupied by a synopsis of American *Mantidæ*, forming, as the author remarks, a complement to the 3rd fascicule of his 'Mélanges,' from which the American species were excluded owing to the 'Mission' being then in the press. The following are the new genera and species:—

Orthodériens.

Chætessa caudata, p. 11, *brunneriana*, p. 14, Brazil.

Mantiens.

Angela miranda, p. 60, Mexico.

Macromantis, g. n., p. 77, formed to receive *Mantis ovalifolia*, Stoll, and *M. hyalina*, De Geer.

Miopteryx brunneri, p. 113, New Friburg.

Oligonyx brunneri, p. 119, Porto Cabello.

Harpagiens.

Acanthops brunneri, p. 144, Surinam.

Empusiens.

Vates pectinata, p. 163, fig. 34, Mexico?; *paraensis*, p. 168, Para.

The greater part of the recent additions to the fauna were diagnosed by the author in the MT. schw. ent. Ges. iii. (*cf.* Zool. Rec. vii. p. 456), and are here described in detail.

In the 'Mélanges Orthoptérologiques,' fasc. iv., the author revises all his previous works, with many changes in nomenclature (see p. 90), and with again numerous additions to the species previously known; these are:—

Orthodériens.

Eremiaphila numida, p. 6, Algeria.

Orthodera marginata, p. 8, fig. 1, Swan River.

Chiropacha meridionalis, p. 10, fig. 19, and *lenticularis*, p. 11, fig. 18, Natal.

Oxyophthalma collaris, p. 14, fig. 17, Senaar.

Humbertiella ocularis, p. 16, Borneo.

Mantiens.

Acontista brevipennis, p. 21, fig. 20, and *major*, p. 22, Brazil.

Pseudomantis kraussiana, p. 25, fig. 3, New Holland.

Archimantis sobrina, p. 26, Swan River.

Euchomena moluccarum, p. 27, fig. 5, Moluccas.

Gonypeta (*Iridopteryx*) *infumata*, p. 30, Egypt?

Mantis viridis, p. 47, Natal.

Ameles gracilipes, p. 50, Cape?; *alata*, p. 51, Turkestan.

Liturgousa surinamensis, p. 53, Surinam.

Iris rogenhoferi, p. 55, fig. 9, Natal.

Angela fulgida, p. 61, Cayenne.

Oxythespis turcomaniæ, p. 61, Turkestan.

Parathespis anomala, p. 64, fig. 13, Cape.

Miomantis brevipennis, p. 68, Natal; *savignii*, p. 69, Senaar; *semialata*, p. 71, fig. 14, Natal.

HARPAGIENS.

Haania kraussi, p. 75, fig. 26, Swan River.

Pachymantis rogenhoferi, p. 77, fig. 27, Moluccas?

Sibylla tridens, p. 81, fig. 29, Zanzibar.

EMPUSIENS.

Stenovates pantherina, p. 84, fig. 31, Central America.

Heterovates (g. n.) *pardalina*, p. 85, fig. 32, Brazil.

Theoclytes minor, p. 85, fig. 33, Brazil.

Chæradodis squilla, Sauss. Lucas describes the hitherto unkown ♀, from Madras. Ann. Soc. Ent. Fr. (5) ii. p. 31.

PHASMIDÆ.

SAUSSURE, in the 'Mission Scientifique au Mexique,' &c. (liv. i.), gives details on structure, manners, development of the organs of flight, mimicry, &c.; and (livr. ii., not seen by the Recorder) the species are worked out in the same manner as the *Blattidæ* of this work. He describes a new genus, *Phantasis* (to receive *Phasma planula*, Westwood, *Anophelepis vittata*, Westwood, and *A. scythus*, Westwood), and a new species, *Bacteria cubaensis*.

Eurycantha calcarata. LUCAS describes and figures the sexes and larva of this species, and remarks that his *E. insularis* is only the ♀, and larva of the ♂, of the same species. He prefaces his paper by remarks on the habits of insects of this genus according to the observations of Montrouzier. Ann. Soc. Ent. Fr. (5) ii. pp. 19–31, pls. 8–10.

GRYLLIDÆ.

Œcanthus pellucens, Scop. Girard notes the discovery of this abundantly at Champigny and other localities in France. Bull. Soc. Ent. Fr. (5) ii. p. lxxix.

LOCUSTIDÆ.

Thomas describes the following new species:—

Copriophora mucronata, Canad. Ent. iv. p. 17, Washington (introduced).

Stenopelmatus fasciatus, Geolog. Survey Montana, p. 434, Wyoming, Utah, Texas, &c.

Ceuthophilus pallidus, p. 434, Colorado and Wyoming; *castaneus*, p. 435, *pacificus*, p. 436, and *bilobatus*, p. 437, California.

Anabrus coloradus, p. 440, Eastern Colorado.

Thamnotrizon scabricollis, p. 441, Southern Montana.

Decticus pallidipalpis, p. 442, Utah and Idaho.

Locusta fuliginosa, p. 443, Arizona; *occidentalis*, p. 444, California.

ACRYDIIDÆ.

KÖPPEN, F. T. Die geographische Verbreitung der Wanderheuschrecke (*Pachytylus migratorius*, Linn.). Geogr. MT. xvii. pp. 361–386, Taf. 18 (map). 1871.

An exhaustive analysis of this memoir is given by P. de Borre in CR. ent.

Belg. 1872, pp. xviii–xxiii. Köppen, in considering the enormous area over which the species has been found, gives three distinct limits for its distribution:—(1) countries in which it permanently breeds; (2) those beyond these in which it continues for a few years and then disappears; (3) those to which its migrations are occasionally extended, but where it never breeds. De Selys-Longchamps (*l. c.* pp. xxiii & xxiv), in continuation of De Borre's remarks, points out that two species are commonly confounded under *P. migratorius*, viz. this and *P. cinerascens*, F.; and he states that in Belgium the former is only of occasional occurrence, whereas the latter appears every year in certain localities, and no doubt breeds in the kingdom.

Extracts from a South Australian newspaper respecting the ravages caused by "locusts" in that colony appear in P. E. Soc. 1872, pp. xii–xvii.

Œdipoda pruinosa, Thomas, = *trifasciata*, Say; *Boopedon nigrum*, Thomas, = *nubilum*, Say: Thomas, Geolog. Survey of Wyoming, p. 273.

Acrolophitus, g. n., *id. l. c.* p. 278. Type *Gryllus hirtipes*, Say.

New species:—

Stenobothrus obionus, p. 279, *brunneus*, p. 280, Cañon City, *quadrimaculatus*, p. 280, S. Colorado: *id. l. c.*

Acridium ambiguum, id. Geolog. Survey Montana, p. 447, S. Illinois, Kansas, and Tennessee; *frontalis*, p. 448, pl. ii. fig. 1, Kansas.

Caloptenus dodgii, id. Canad. Ent. iii. (1871) p. 168, Pike's Peak, Colorado; *viridis*, id. Geolog. Survey Montana, p. 450, Colorado, Wyoming, and Kansas; *turnbulli*, p. 452, pl. ii. fig. 10, and *occidentalis*, p. 453, pl. ii. fig. 2, Wyoming; *griseus*, p. 454, Ohio.

Pezotettix obesa, p. 454, pl. ii. figs. 13 & 14, between Idaho and S. Montana; *nebrascensis*, p. 455, Nebraska: *id. l. c.*

Œdipoda undulata and *haydeni*, p. 460, Colorado and Wyoming; *kiowa*, p. 461, Colorado; *gracilis*, p. 461, Colorado and Wyoming; *wyomingana*, p. 462, E. Wyoming; *montana*, p. 462, S. Montana; *longipennis*, p. 463, Texas?: *id. l. c.*

Stenobothrus bicolor, p. 465, Colorado and Wyoming: *id. l. c.*

Oxycoryphus obscurus, p. 466, Wyoming: *id. l. c.*

RHYNCHOTA

By E. C. Rye.

HEMIPTERA-HETEROPTERA.

Bold, Thomas John. A Catalogue of the Insects of Northumberland and Durham. Hemiptera-Heteroptera. Tr. North. Durh. iv. (1872), pp. 348–369.

151 species (1 new) are enumerated, with notices of localities, and occasionally of habits &c.

Czernay, A. [See Ivanoff, P.]

Horváth, Geyza v. Beiträge zur Kenntniss der Hemipteren-Fauna Ungarns. Pest: 1871.

Not seen by the Recorder.

Ivanoff, P., & Czernay, A. "Enumération de Hémiptères héteroptères trouvés dans les environs de la ville de Koupiansk," "suivie d'un Supplément—composée d'une liste de Hémiptères héteroptères des environs de la ville de Kharkow, appartenant au musée de l'université et déterminés par feu le professeur Krynicki." Travaux de la Société des naturalistes à l'université Impériale de Kharkow, iv. (1871, 4to) pp. 69–76.

The Recorder has not seen this work, but finds the above notice in Hor. Ent. Ross. viii., Revue Bibliographique, p. ix. The first list appears to be composed of 75 species; and the supplement, by Czernay alone, reproduces short Latin descriptions, found in the catalogue of the University collections made by Krynicki in 1834, of the following spp. nn.:—*Scutellera albipunctata, trigona*, and *obtusata*, and *Ælia panzeri*, and 3 varr. nn. of *Pentatoma festiva, Syromastes scapha*, and *Hydrometra lacustris*.

Oschanine, B. Species novæ Hemipterorum. Moscou: 1870.

——. Hemiptera Sarafschanensia. Moscou: 1871.

Not seen by the Recorder; probably published in Nachr. Ges. Mosc. vi. & vii.

Snellen van Vollenhoven, S. C. Essai d'une Faune Entomologique de l'Archipel Indo-Néerlandais. 3me monographie: famille des Pentatomides. Pt. 1. La Haye: 1868, 4to, pp. 49, pls. i.–iv.

Comprises from the *Asopidæ* to the *Megymenidæ* inclusively. Several new species are described.

Stål, C. Enumeratio Hemipterorum. Bidrag till en förteckning öfver alla hittils kända Hemiptera. Pt. 2. Sv. Ak. Handl. x. (1872), No. 4, pp. 1–159.

Continuing his treatment of the American species, the author in this part discusses his *Cimicina*, pp. 3–65, and *Reduviina*, pp. 66–128; giving additions and corrections affecting pts. 1 & 2, pp. 129–131, and an index (containing several errors), pp. 132–159. In addition to many evidently new genera and species, the author, in tables and elsewhere, indicates various subfamilies, many of which are probably new; but for which, and for the copious synonymy (much of which may be original), reference must be made to the work itself.

Uhler, P. R. Notes of the Hemiptera of the Western Territories of the United States, chiefly from the Surveys of Dr. F. V. Hayden. In Hayden's Preliminary Report of the United States Geological Survey of Montana. Washington: 1872 (pt. iv.), pp. 392–423.

New genera and species are described. Melanism seems to prevail in species belonging to the mountains of Nevada, while in Colorado and Idaho the insects present the richest and brightest colours.

WALKER, FRANCIS. Catalogue of the Specimens of Hemiptera Heteroptera in the Collection of the British Museum. Part v. pp. 1–202 (1872).

Completes the *Supericornia* (containing the completion of the *Coreidæ*, and the *Lygæidæ*, *Anthocoridæ*, and *Microphysidæ*), and commences the *Cæcigenæ* (*Pyrrhocoridæ*, including the *Largidæ*). The title is scarcely correct, as the object of the work is to give a complete list of all the genera and species known to exist in the collections of European and American Entomologists.

Captures near London: J. W. DOUGLAS, Ent. M. M. viii. p. 289.

F. BUCHANAN WHITE, under the heading "Notes on Scottish Hemiptera," refers to the habits of various well-known species. Scot. Nat. i. pp. 223–226, 263–265.

Corsica. T. A. MARSHALL, Ent. M. M. viii. p. 191, gives localities for, and a few general remarks concerning, species found by him in this island. Descriptions of new species &c. are added by J. Scott.

Madagascar. In Aug. Vinson's 'Voyage à Madagascar au couronnement de Radama II.' (Paris: 1865, roy. 8vo), Annexe D, pp. 19–22, is a list of 191 species by C. COQUEREL.

Names of a few species occurring north of the United States of America are given by F. WALKER: Canad. Ent. iv. p. 29.

E. Colorado and N.E. New Mexico. In Hayden's Geological Survey of Wyoming (1871) is a list of species collected by C. Thomas during the survey of 1869.

The figures and descriptions by Blasquez, in 'Naturaleza,' of *Lystra bombycida* and *Velia* (? *Harpactor*) *agavis*, mentioned in the 'Bericht' published in 1873, p. 114, have not been seen by the Recorder.

On collecting and preserving, *cf.* PUTON, Pet. Nouv. No. 65, p. 262.

[SCUTATA.]

STÅL, Œfv. Ak. Förh. xxix. (1872) No. 3, pp. 31–40, revises the European genera of his family *Pentatomidæ*, including therein as subfamilies the *Scutellerina*, *Pentatomina*, *Asopina*, *Acanthosomina*, *Dinidorina*, and *Phyllocephalina*. These groups will be here discussed as a whole, to avoid confusion with the references to other now recorded works of the author. The *Scutellarina* are composed of the divisions *Elvisuraria* (*Solenostethium*, Spin.), *Odontotarsaria* (*Odontarsus*, Lap., *Ellipsocoris*, Mayr, *Phimodera*, Germ.), *Eurygastraria* (*Psacasta*, Germ., *Eurygaster*, Lap.), and *Odontoscelaria* (*Irochrotus*, Am. & S., *Odontoscelis*, Lap.); the *Pentatomina* of the *Tarisaria* (*Tarisa*, Am. & S.), *Trigonosomaria* (*Trigonosoma*, Lap., *Vilpianus*, St., *Crypsinus*, A. Dohrn), *Graphosomaria* (*Sternodontus*, Muls. & R., *Ancyrosoma*, Am. & S., *Tholagmus*, St., *Graphosoma*, Lap.), *Podoparia* (*Podops*, Lap., *Scotino-*

phara, Stål, type *Podops siculus*, Costa), *Halyaria* (*Mustha*, Am. & S., *Apodiphus*, Spin.), *Sciocoraria* (*Dorydera*, Spin., *Sciocoris*, Fall., *Menaccarus*, Am. & S.), *Æliaria* (*Ælia*, F., *Neottiglossa*, Kby.), *Eusarcocoraria* (*Dalleria* and *Onylia*, Muls., *Analocus*, g. n., p. 36, for *Eusarcocoris misellus*, Stål, and *E. melanocephalus*, F., *Eusarcocoris*, Hahn, type *E. perlatus*, F.), *Pentatomaria* (*Rubiconia* and *Staria*, Dohrn, *Peribalus*, Muls., = *Dryocoris*, Muls., *Palomena*, Muls., *Holcostethus*, Fieb., type *H. jani*, Fieb., and to which genus *Pentatoma scapularis*, Thunb., *apicalis*, H.-S., and *goniodes*, Dall., are to be referred, *Carpocoris*, Kol., *Codophila*, Muls., St., *Dolycoris*, Muls., *Pentatoma*, Ol., *Chroantha*, g. n., p. 38, type *Pentatoma ornatula*, H.-S., *Brachynema*, Muls., *Nezara*, A. & S., *Acrosternum* and *Piezodorus*, Fieb., *Rhaphidogaster*, Lap., *Tropi[do]coris*, Hahn, *Holcogaster*, Fieb.), and *Strachiaria* (*Eurydema*, Lap., = *Strachia*, Fieb., *Stenozygum*, Fieb., = *Minodia*, Muls., *Bagrada*, St., = *Nitilia*, Muls.); the *Acanthosomina* of *Acanthosoma*, Curt., *Elasmostethus*, Fieb., *Clinocoris*, Hahn, *Cyphostethus*, Fieb.; the *Asopina* of *Cimex*, L. (subgg. *Cimex*, L., = *Pieromerus*, Am. & S., and *Pinthæus*, St., = *Platynopus*, Fieb., *nec* A. & S.), *Ialla*, Hahn, *Troilus*, St. (*Asopus*, Fieb.), *Arma*, Hahn, *Rhacognathus*, Fieb., *Zicrona*, A. & S.; the *Dinidorina* of *Aspongopus*, Lap.; the *Phyllocephalina* of *Schizops*, Spin.

The author, *ibid.* No. 6, pp. 56–58, publishes some addenda to his synopsis of this family :—Subf. *Pentatomina*, div. *Trigonosomaria*, gen. *Putonia*, Stål (*P. torrida*, Stål, Algeria, p. 57, evidently a new species, although no indication of its novelty is given by the author. The Recorder wishes to remark that it is not improbable that some of Stål's genera in this series of papers may also be new, but that, as that author has in only two instances placed the letters "n. g." after generic names, no others but these two have been indicated as new in this Record), *Crypsinus*, transferred from the *Graphosomaria*, and *Leprosoma*, Bär.; div. *Graphosomaria*, gen. *Vilpianus*, St., transferred from the *Trigonosomaria*; div. *Halyaria*, gen. *Mecidea*, Dall. (*M. pallida*, Stål).

Puton, Ann. Soc. Ent. Fr. (5) p. 508, reviews this work.

Pachycoridæ.

Homæmus bijugis, sp. n., Uhler, in Hayden's Geol. Surv. Montana, p. 393, Colorado, Nebraska.

Podopidæ.

Oncozygia, g. n., Stål, Sv. Ak. Handl. x. p. 15. Differs from *Podops* in structure of head, approaching *Aspidestrophus*, but narrower, with longer head, antero-lateral lobe of thorax spinose, and no tubercle to apical angles of ventral segments. *O. clavicornis*, sp. n., *id. l. c.* p. 16, Texas.

Asopidæ.

Cazira verrucosa, Westw., var. figured, pl. 1. fig. 1; *Audinetia*, Ellenrieder, = *Arma*, Hahn; *Zicrona illustris*, A. & S., ? = *cærulea*, L., local var.: Vollenhoven, Essai &c. iii. (i.). *Zicrona cuprea*, Dall., Hudson's Bay, Idaho, New Mexico, = *cærulea*, L.: Uhler, in Hayden's Geol. Surv. Montana, p. 395.

Picromerus bidens. A. Müller, Tr. E. Soc. 1872, pp. 283-285, narrates the manner in which this insect has been observed by himself to check the ravages of larvæ of a *Nematus* (? *ochraceus*, Htg.) on *Salix cinerea*.

Canthecona rufescens, Java, pl. 1. fig. 2, *apicalis*, Ternate &c., pl. 1. fig. 3, p. 6; *plebeia*, Ternate, pl. 1. fig. 4, *mitis*, Timor, pl. 1. fig. 5, p. 7; *biguttata*, Aru, pl. 1. fig. 6, *variabilis*, Timor, pl. 1. figs. 7 & 8, p. 8; *acuta*, Timor, pl. 2. fig. 1, *decorata*, Halmaheira, pl. 2. fig. 2, p. 9: Vollenhoven, *l. c.*, spp. nn.

Asopus carnifex, Ternate, p. 12, pl. 2. fig. 3; *distigma*, Amboina, pl. 2. fig. 4, *semiviolaceus*, Halmaheira, pl. 2. fig. 5, p. 13; *bernsteini*, p. 14, pl. 2. fig. 6, New Guinea: *id. l. c.*, spp. nn.

CYDNIDÆ.

Vollenhoven, *l. c.* p. 18, reproduces descriptions of *Hahnia gibbula* and *Æthus? rariciliatus*, Ellenrieder (from Tijd. Nederl. Ind. xxiv.).

Cyrtomenus insignis, sp. n., Vollenhoven, *l. c.* p. 16, pl. 2. fig. 7, Java &c.

Æthus pallidicornis, sp. n., *id. l. c.* p. 17, pl. 2. fig. 8, Java, Ceram.

Acatalectus luteimarginatus, sp. n., *id. l. c.* p. 19, pl. 2. fig. 9, Timor.

Microporus obliquus, sp. n., Uhler, in Hayden's Geol. Surv. Montana, p. 394, Utah.

SCIOCORIDÆ.

Dryptocephala latiloba, Brazil, *obtusiceps*, New Granada, Stål, Sv. Ak. Handl. x. p. 4, spp. nn.

Discocephala (*Platycarenus*) *marginella*, sp. n., *id. l. c.* p. 6, Mexico.

HALYDIDÆ.

Brochymena 4-*pustulata*, H.-S., *nec* F., renamed *myops*: Stål, *l. c.* p. 16. *B. harrisi*, Uhler, and ? *B. carolinensis*, Westw., = *annulata*, F.; *Apateticus halys*, Dall., = *Halys lineolata*, H.-S.: *id. l. c.* p. 17. *Allocotus*, Mayr, is to be removed from the *Asopidæ* and placed in this family, near *Alphenor*: *id. l. c.* p. 129.

Caracia, g. n., *id. l. c.* p. 14. Of uncertain position, possibly best next to *Macropygium*. *C. sexdens*, sp. n., *id. l. c.* p. 15, Venezuela.

Melanodermus picipes, sp. n., *id. l. c.* p. 14, New Granada.

Chlorocoris subrugosus, sp. n., *id. l. c.* p. 36, Mexico.

PENTATOMIDÆ.

Euschistus punctipes, Say. Earlier stages described and figured: it is parasitic upon *Doryphora* 10-*lineata*. In its larva and pupa the tarsi and antennæ have one joint less than in the perfect insect, the second joint of each subsequently dividing into two. This structure may be general in the *Scutelleridæ*; it is mentioned by Westwood with regard to *Pentatoma rufipes*, and has been also observed by the author in *Arma spinosa*, *Brochymena annulata*, *Stiretrus fimbriatus*, *Rhaphidogaster*, and *Nazara*. C. V. Riley, iv. Rep. Ins. Mo. p. 20, fig. 9.

Cimex baccarum, Lichtenstein, Pet. Nouv. no. 45, p. 179, considers this name should be retained for the downy species with annulated antennæ and

obtuse shoulders, in spite of the Linnæan type (glabrous, dark antennæ, pointed shoulders, = *nigricornis*, F.).

Strachia (*Murgantia*) *histrionica*, Hahn, extends now further north: in the south its dark colours prevail, *M. munda*, Stål, from Mexico, being merely a race of it. Uhler finds that in specimens reared in the dark the pale red predominates, and in others reared in bright daylight the dark blue prevails. Earlier stages described and figured, and an account of its ravages to cruciferous plants given. C. V. Riley, *l. c.* pp. 35–38, fig. 17.

Eurydema ornatum. Chalcididous parasites on its eggs described by Rondani, Bull. Ent. Ital. iv. pp. 202 & 203.

Acanthosoma griseum: dates of brooding &c. given by J. Hellins, Ent. M. M. ix. p. 13.

Melanostoma [Schiner, *Diptera*; 1860], subg. n. of *Neottiglossa*, Kby. (itself a subg. of *Pentatoma*), Stål, Sv. Ak. Handl. x. p. 18. *N.* (*M.*) *sulcifrons* and *cavifrons*, Texas, *id. ibid.*, spp. nn.

Melanochila, subg. n. of *Mormidea*, A. & S., for *M. lugens*, F.: *id. l. c.* p. 19.

Sibaria, g. n., *id. l. c.* p. 23. Allied to *Mormidea*, but head more narrowed in front, larger eyes, spinose femora, sulcated tibiæ, &c.; differs from *Euschistus* in obtuse and transversely rugose lateral margins of thorax. *Mormidea armata*, Dall.

Rhytidolomia, subg. n. of *Lioderma*, Uhler, for *L. senilis*, Say, and *belfragii*, sp. n., Illinois: *id. l. c.* p. 33.

Chlorochroa, subg. n. of same genus, for *L. ligata*, Say, and *uhleri*, Mexico, *sayi*, California, spp. nn.: *id. ibid.*

Modicia, g. n., *id. l. c.* p. 46. Size of *Mormidea*; allied to *Phineus*, *Serdia*, &c., but with 2nd joint of antennæ more than twice the length of 3rd. *M. sexlineata*, sp. n., *id. ibid.*, Cuba.

Blaudus, g. n., *id. l. c.* p. 61. Differs from *Bebæus*, Dall., in its shorter head &c. *B. ruficornis*, sp. n., *id. l. c.* p. 62, New Granada.

Præsus, g. n., *id. l. c.* p. 63. Nearest to *Ditomotarsus*, Spin. *P. incarnatus*, sp. n., *id. l. c.* p. 64, New Granada.

New species:—

Cosmopepla cruciaria, id. *l. c.* p. 19, New Granada.

Mormidea albisignis, Cuba, *metallica*, New Granada, p. 20, *fusca* and *angulosa*, New Granada, *sordidula*, Texas, *grisescens*, Mexico, p. 21: *id. l. c.*

Œbalus insularis, id. *l. c.* p. 22, Cuba.

Euschistus picticornis, p. 23, *cribrarius* and *trilobus*, p. 24, *bilobus* and *armipes*, p. 25, Brazil, *tauricornis*, p. 25, Uruguay, *impictiventris*, p. 26, Texas, *rugifer*, p. 26, *integer*, p. 28, Mexico, *trisinuatus* and *rufimanus*, p. 27, New Granada: *id. l. c.*; *E. fissilis*, Uhler, in Hayden's Geol. Surv. Montana, p. 396, Colorado, Nebraska, Illinois.

Holcostethus abbreviatus, id. *l. c.* p. 397, Kansas, Colorado, California.

Pentatoma granulosa, id. *l. c.* p. 398, Montana, Utah.

Proxys obtusicornis, Stål, *l. c.* p. 29, New Granada.

Hymenarcys reticulata, id. *l. c.* p. 30, Mexico.

Œnopia pallidula, id. *l. c.* p. 31, Buenos Aires.

Melpia inermis, p. 31, *sinuata*, p. 32, Brazil, *id. l. c.*

Trichopepla atricornis, id. *l. c.* p. 34, Illinois.

Peribalus limbolarius, id. *ibid.*, N. America; *P. modestus*, Uhler, *l. c.* p. 396, Arizona, eastern States of Mississippi.

Arocera rufilimbata, Stål, *l. c.* p. 38, S. Brazil.

Nezara nigritarsis and *rogenhoferi*, p. 40, *napæa*, p. 42, Brazil; *impicticornis*, New Granada, *bipunctula*[*ta*], Bahia, p. 42: *id. l. c.*

Banasa packardi, p. 43, *euchlora*, p. 44, N. Carolina: *id. l. c.*

Piezodorus herbaceus; id. *l. c.* p. 44, I. St. Thomas.

Sinopla bicallosa, id. *l. c.* p. 62, New Granada.

Edessidæ.

Pygoplatys ralandii, Ellenr.; description reproduced, p. 24. *Tesseratoma angularis*, Dohrn, and *proxima*, Hope, =*javanica*, Thunb.; anus of ♂ figured, *T. javanica*, pl. iii. fig. 4 *b*, *chinensis*, 4 *a*. *T. conspersa*, Stål, =*stictica*, de H., and *nigripes*, Dall., =*javanica*, varr., and var. n. *timorensis*, p. 26, described and figured, pl. iii. fig. 4. *Eurostus grossipes*, Dall., is queried as a local var. of *Eusthenes scutellaris*, Hagenbach (no description by that author mentioned), which is figured pl. iii. fig. 5. *Eusthenes scutellaris*, Herr.-Sch., is renamed *minor*, p. 29, as Hagenbach's type in Leyden Museum is referable to the last-mentioned species [which, however, if grounded on a type only, with no description published, could not possibly have precedence over Herrich-Schäffer's name]. *Oncomerus flavicornis*, Guér., var. n. *chrysoptera*, Wagiou, p. 30, pl. 4. fig. 2. *O. dilatatus*, Montr., ?=*merianæ*, F., var. *Pycanum amethystinum*, F., =*rubens*, F., of which 5 varr. are noted. *P. westwoodi*, Voll., figured, pl. iii. fig. 7. *Lyramorpha vollenhoveni*, Stål, figured, pl. iv. fig. 3; differences in the number of joints to the antennæ in this genus commented on, p. 35, note. *Cyclopelta obscura*, Lep. & S.; var. (? sp.) n., *trimaculata*, p. 37, pl. iv. fig. 4, Malacca, Borneo. Javan var. of *Aspongopus ochreus*, Hope, described, p. 38. Vollenhoven, Essai &c. iii. (i.).

Edessa (*Aceratodes*) *cordifer*, Walk., is renamed *albicors*: Stål, Sv. Ak. Handl. x. p. 58.

Acidosterna, g. n., *id. l. c.* p. 129. Allied to *Hypencha*, A. & S. *A. nitida*, sp. n., *id. l. c.* p. 130, Malacca.

Liphæmus, subg. n. of *Cyclogaster*, Westw., for *C.* (*L.*) *exsanguis*, sp. n.: *id. l. c.* p. 130, Brazil.

Edessa thunbergi, p. 49, *costalis*, p. 50, *pictiventris*, p. 52, *falleni*, p. 53, *fuscispina*, p. 55, New Granada; *laticornis*, p. 50, *bonasia*, p. 54, *conspersa*, *westringi*, *picticornis*, p. 58, *mexicana*, *punctiventris*, p. 59, Mexico; *cylindricornis*, *flavinervis*, p. 51, *biguttata*, p. 52, *rugifera*, p. 53, *sahlbergi*, p. 54, *aulacosterna*, p. 56, *ovalis*, p. 57, Brazil; *antennata*, p. 51, Surinam; *limbolaria*, p. 55, locality unknown: *id. l. c.*, spp. nn.

Mucanum patibulum, sp. n., Vollenhoven, Essai &c. iii. (i.) p. 22, pl. 3. fig. 1, Sumatra.

Pygoplatys subrugosus, pl. 3. fig. 2, Amboina; *minax*, pl. 3. fig. 3, Borneo, p. 23; *roseus*, p. 24, note, Malacca: *id. l. c.*, spp. nn.

Oncomeris bernsteini, sp. n., *id. l. c.* p. 30, pl. 4. fig. 1, Halmaheira.

Aspongopus muelleri, sp. n., *id. l. c.* p. 39, pl. 4. fig. 5, Java.

Phyllocephalidæ.

Placosternum, A. & S., belongs to the true *Pentatomidæ*; description of *Gonopsis setadjemdei*, Ellenr., reproduced. Vollenhoven, *l. c.* pp. 40 & 44.

Megarhynchus intermedius and *fuscus*, spp. nn., *id. l. c.* p. 44, Ningpo.

Megymenidæ.

Megymenum merati, Le Guillou,=*cupreum*, Guér. (figured pl. iv. fig. 8), of which *inerme*, H.-S., is probably only a var.; *M. affine*, Boisd., description reproduced, p. 48. *M. crenatum*, De G., ?=*insulare*, Hope. *Eumenotes obscura*, Westw., occurs in Java, Celebes, and Sumatra: Vollenhoven, *l. c.*

Byrsodepsus, g. n., Stål, *l. c.* p. 130. Allied to *Megymenum*. *B. coriarius*, sp. n., *id. l. c.* p. 131, Silhet.

Megymenum semivestitum, fig. 6, Amboina; *quadratum*, fig. 7, Morotai; *anacanthum*, fig. 9, Sumatra, p. 46; *parallelum*, fig. 10, p. 48, Java and Sumatra: Vollenhoven, *l. c.* pl. iv., spp. nn.

Mictidæ.

Metapodius thomasi, sp. n., Uhler, in Heyden's Geol. Surv. of Montana, p. 399, Arizona.

Alydidæ.

Alydus rupestris, "Meyer," figured, MT. schw. ent. Ges. iv. pl. 1. fig. 5.

Alydus ater, Dall.,=*curinus*, Say, ♀: Uhler, *l. c.* p. 401.

Alydus pluto, sp. n., *id. l. c.*, Colorado, Kansas.

Coreidæ.

Stål, Œfv. Ak. Förh. xxix. (1872), no. 6, pp. 49–58, under this name revises the European genera of the subfamilies *Coreina*, *Pseudophlœina*, *Alydina*, and *Corizina*. The *Coreina* consist of the divisions *Gonoceraria*, gen. *Gonocerus*, Latr.; *Corearia*, gg. *Verlusia*, Spin., *Haploprocta*, Stål (type *Verlusia sulcicornis*, F.), *Coreus*, F. (*Enoplops*, Am. & S., *Palethrocoris*, Kol.), *Syromastes*, Latr., *Centrocoris*, Kol. (*Centrocarenus*, Fieb.; *Centrocoris*, Fieb., = *Vilga*, Stål, and is American), and *Cercinthus*, St. (*Coccodocephalus*, Fieb.); *Atractaria*, gen. *Atractus*, Lap. (*Spathocera*, Stein); *Prionotylaria*, gen. *Prionotylus*, Fieb. (*Myrmidius*, Costa); and *Phyllomorpharia*, gen. *Phyllomorpha*, Lap.: the *Pseudophlœina* of *Pseudophlœus*, Burm., *Bathysolen*, Fieb., *Arenocoris*, Hahn, *Nemocoris*, Sahlb. (*Aoplochilus*, Fieb., of which an error in diagnosis is suggested, p. 53, note), *Ceraleptus*, Costa, *Strobilotoma*, Fieb., *Dasycoris*, Dall. (*Coreus*, Lap., Fieb.), *Bothrostethus* and *Loxocnemis*, Fieb.: the *Alydina* of the divisions *Stenocephalaria*, gen. *Stenocephalus*, Latr. (*S. neglectus*, H.-S.,=*Reduvius albipes*, F., which is a *Stenocephalus*); *Micrelytraria*, gen. *Micrelytra*, Lap.; *Leptocorisaria*, gen. *Leptocorisa*, Latr.; *Alydaria*, gg. *Camptopus*, A. & S., *Alydus*, F., and *Megalotomus*, Fieb. (*Alydus ornaticeps*, St.,=*sareptanus*, Bärenspr.): and the *Corizina* of the divisions *Conizaria*, gg. *Corizus*, Fall., *Liorhyssus*, St. (*Colobatus*, Muls.), *Rhopalus*, Schill. (subg. *Æschyntelus*, Stål), *Brachycarenus*, Fieb., *Stictopleurus*, Stål (*Rhop. crassicornis*, L., and *abutilon*, Rossi), *Maccevethus*, Dall., *Agraphopus*, Stål (with an evidently new species, although no indication whatever is

given of its novelty beyond the description; *A. lethierrii*, Bone, p. 56), and *Myrmaria*, genn. *Myrmus*, Hahn, *Chorosoma*, Curt.

Puton, Ann. Soc. Ent. Fr. (5) ii. p. 500, reviews this work.

Namacus rufescens, p. 1, Orizaba, *semialbus*, p. 2, Villa Nova: Walker, Cat. Hem. Brit. Mus. pt. v., spp. nn.

Clavigralla spinigera, Penang, *dispar*, no locality given: *id. l. c.* p. 6, spp. nn.

Dasycoris humilis, sp. n., Uhler, in Hayden's Geol. Surv. Montana, p. 403, Colorado, California.

Rhopalidæ.

Corizus viridicatus, sp. n., Uhler, *l. c.* p. 404, Colorado, Dakota.

Berytidæ.

Neides decurvatus, sp. n., Uhler, *l. c.* p. 402, Colorado, New Hampshire.

Pyrrhocoridæ.

Roscius 4-plagiatus, p. 173, Congo; *Odontopus bœrhaviæ*, p. 176, Natal; *Dysdercus ruficeps*, p. 183, ? S. America; *D. superstitiosus*, p. 185, Angola; *D. cingulatus*, p. 187, Wagiou; *D. philippinus*, p. 188: forms (? spp., ? varr.) described, not named, by Walker, Cat. Hem. Brit. Mus. pt. v., who describes the following new species:—

Pyrrhocoris vittiventris, N. Hindostan, *maculicollis*, N. China, p. 171; *indecorus*, Siam, *ramosus*, Sarawak, *lateralis*, Moreton Bay, p. 172.

Roscius fasciatus, p. 174, Sierra Leone.

Odontopus dilectus, p. 176, Aden; *scutellaris*, p. 178, North Bengal.

Dysdercus mundus, p. 181, Mexico; *jamaicensis*, Jamaica, *fervens*, St. Domingo, p. 182; *coloratus*, p. 189, Ceram, Java; *albescens*, Fiji Isles, *concinnulus*, Flores, p. 190; *discolor*, ibid., *pectoralis*, p. 191, locality unknown.

Lygæidæ.

Stal, Œfv. Ak. Förh. xxix. (1872) no. 7, pp. 37–62, revises the European genera under the subfamilies *Lygæina*, *Cymina*, *Blissina*, *Henestarina*, *Geocorina*, *Artheneina*, *Teracriina* (to which the *Pachygronthina*, *Pachygrontha* and *Œdancala*, are very closely allied), *Oxycarenina*, *Myodochina*, *Pyrrhocorina*, and *Heterogastrina*. The *Lygæina* are composed of the following divisions:—1. *Lygæaria*, gg. *Oncopeltus*, Stål (*L. aulicus*, F.), *Melanospilus*, St. (*L. venustus*, Bœber), *Lygæus*, F., and subgg. *Cosmopleurus*, St. (*L. fulvipes*, Dall.), *Graptolomus*, St. (*L. equestris*, L., and *creticus*, Luc.), *Spilostethus*, St. (*L. militaris*, F., and *saxatilis*, Scop., and *Lygæodon marmottani*, Puton, = *Lygæus longulus*, Dall.), and *Melanocoryphus*, St. (*L. apuans*, Rossi, and *punctatiguttatus*, F., which is sometimes hemelytrous, and *Lygæosoma tristrami*, D. & S.), *Lygæosoma*, Spin., and subgg. *Graptostethus*, St. (*L. maculicollis*, Germ., *Apterola kuenckeli*, Muls., = *L. pedestris*, St., *G. rubicundus*, Palestine, p. 42, apparently sp. n.), and *Lygæosoma* proper; *Arocatus*, Spin. (*Tetralaccus*, Fieb.; *A. rufipes**, ? Siberia, and *longiceps**, Greece, p. 42), and *Cœnocoris*, Fieb. 2. *Orsillaria*, gg. *Nysius*, Dall., comprising subgg. *Macroparius*, St. (*Nysius graminicola*, Kol.), *Nysius* proper (*N. jacobeæ*,

thymi, &c.), and *Ortholomus*, St. (*N. punctipennis*, H.-S.), and *Orsillus*, Dall. (♂ unknown). The *Cymina* are composed of divisions *Cymaria* (gg. *Cymus*, Hahn, and *Cymodema*, Spin., the latter unknown as European) and *Ischnorhyncharia* (*Ischnorhynchus*, Fieb.); the *Blissina* of *Ischnodemus*, Fieb., *Dimorphopterus*, St. (*Micropus spinolæ*, Sign., and *D. signoreti**, A. Kusch, probably a MS. name, described, p. 45, from Sarepta), and *Blissus*, Klug; the *Henestarina* of *Henestaris*, Spin., and *Engistus*, Fieb. (*E. exsanguis**, Stål, p. 45, Biskra); the *Geocorina* of *Piocoris*, St. (*Geocoris erythrocephalus*, St. F. & S., and *P. obesus**, Stål, p. 45, Biskra), *Geocoris*, Fall. (with subgg. *Geocoris* proper and *Ophthalmicus*, Schill.), and *Mallocoris*, St. (*M. discifer**, St., p. 46, Biskra); the *Artheneina* of *Artheneis*, Spin., and *Chilacis*, Fieb.; the *Teracriina* of *Cymophyes*, Fieb. (*C. decolor**, St., p. 47, Biskra), and, extra-European, *Teracrius* and *Phlegyas* (p. 39, note); and the *Oxycarenina* of *Anomaloptera*, Am. & S., *Philomyrmex*, Sahlb., *Camptotelus*, ? Fieb. (*C. lineolatus**, Schill., p. 48, and *C. costalis*, H.-S., p. 49, Germany, both probably MS. names), *Macropterna*, Fieb., limited to *M. convexa*, Fieb., *Microplax*, *Brachyplax*, *Metopoplax* (*M. fuscinervis**, St., p. 50, Bone), and *Oxycarenus*, Fieb., and *Bycanistes*, St. (*B. naso**, St., p. 50, Bone). The *Myodochina* are composed of the following divisions:—1. *Myodocharia*, gg. *Paromius*, Fieb., *Diplonotus*, St. (*Plociomerus fracticollis*, Schill., and *luridus*, Hahn), *Ligyrocoris*, St. (*P. silvestris*, L.). 2. *Rhyparochromaria*, gg. *Rhyparochromus*, Curt., with subgg. *Rhyparochromus* proper (*Megalonotus*, Fieb.), and *Piezoscelis*, Fieb., *Proderus* and *Tropi*[*do*]*stethus*, Fieb., *Aphanosoma*, Costa (*Pterotmetus*, Am. & S.), *Macrodema*, Fieb., with subgg. *Macrodema* proper (*Pionosomus*, Fieb.) and *Aoploscelis*, Fieb., *Lamprodema*, Fieb., *Plinthisus*, Westw., *Lasiosomus*, *Acompus*, *Stygnus*, and *Lasiocoris*, Fieb., *Pasatus*, St. (*Peritrechus luniger*, Schill.), *Peritrechus*, Fieb., and *Anepsius*, Puton. 3. *Beosaria*, gg. *Hyalochilus* and *Trapezonotus*, Fieb., *Gnopherus*, Stål (*Trapezonotus nigripes*, Fieb., = *anorus*, Flor.), *Trapezonotus*, Fieb. (apparently repeated in error for *Sphragisticus*, Stål, which stands as its sole subgenus, type *T. nebulosus*, Fall., and other spp., including *T. dispar**, St., p. 56, S. France), *Microtoma*, Lap. (*Polyacanthus*, Lap., and *Rhyparochromus leucodermus*, Fieb.), *Pachymerus*, St. F. & S. (*Aphanus*, Lap.), with subgg. *Calyptonotus*, D. & S., *Graptopeltus*, St. (*lynceus*, F., and *adspersus*, Muls.), *Xanthochilus*, St. (*Beosus*, Fieb., *nec* A. & S., for *quadratus*, F., *saturnius*, Rossi, and *douglasi* and *tristis*, Fieb.), *Melandiscus*, St. (*pini*, L., *vulgaris*, Schill., and *phœniceus*, Rossi), and *Raglius*, St. (*caffer*, Thunb., and *pineti*, H.-S.), *Beosus*, A. & S. (*B. luscus*, F., *sphragadimium*, Fieb., and *pulcher*, H.-S.), and *Dieuches*, Dohrn, to which *Elasmolomus*, St., for *Rhyparochromus sordidus*, F., *v-album* and *mendicus* (*caffer*, St.), St., and *transversus*, Sign., possibly European, is at p. 58, note, stated to be very close. 3. *Gonianotaria*, gg. *Neurocladus* (*Acanthocnemis*, Sign.), *Ischnopeza*, *Emblethis*, *Gonianotus* and *Diomphalus*, Fieb. 4. *Lethæaria* for *Lethæus*, Dall. (*Coptoneurus*, Puton; *L. cribratissimus*, St., = *niger*, Fieb.). 5. *Drymaria*, gg. *Ischnocoris*, *Scolopostethus* (? = *Tritomacera*, Costa), *Eremocoris*, *Drymus* (*D. scambus**, St., p. 60, Bone), *Thaumastopus* (including *Notochilus gandolphii*, Puton), and *Notochilus*, Fieb., *Taphropeltus*, St. (*Scolopostethus contractus*, H.-S., with which *hamulatus*, Thoms., is identical, and *S. nervus* and *Notochilus limbatus*, Fieb.), and *Platygaster*, Schill., including subgg. *Platygaster* proper and *Gastrodes*, Westw. The *Pyrrhocorina* are composed of *Pyrrho-*

coris, Fall. (*P. sanguineus*, F., is S. African), and *Scantius*, St. (*S. ægyptius*, L.); and the *Heterogastrina* of *Heterogaster*, Schill., and *Platyplax*, Fieb.

Such of the species above mentioned as are marked * are probably new, being fully described and their localities given; but there is no other indication of their novelty, and none whatever as to the generic divisions of the author, some of which may possibly be now first published.

Reviewed by Puton, Ann. Soc. Ent. Fr. (5) ii. p. 509, who objects to *Aphanosoma*, Costa, being used for *Pterotmetus*, A. & S., as it was originally proposed on insufficient grounds, and, as amended, = *Gryllocoris angusticollis*, Bär. Puton proposes to retain both *Pterotmetus* and *Gryllocoris*. *Drymus scambus*, Stål, = *pilipes*, Fieb.

Lygæus reclivatus, Say, = *turcicus*, L., var.; *L. vicinus* and *marginellus*, Dall., = *bistriangularis*, Say, varr.: Uhler, in Hayden's Geol. Surv. Montana, p. 405.

Lygæus punctatiguttatus is gregarious, and occurs in the Channel Isles, Natal, Teneriffe, and elsewhere: F. Walker, Ent. vi. p. 7.

Emblethis verbasci, F.: a new genus and species for the British lists. J. W. Douglas, Ent. M. M. ix. p. 4.

Mimocoris, g. n., Scott, Ent. M. M. viii. p. 194. Facies of *Camaronotus*, but with projecting eyes &c. *M. camaronotoides*, sp. n., *id. l. c.* p. 195, Corsica.

Anisocoris, g. n., Walker, Cat. Hem. Brit. Mus. pt. v. p. 148 (no differential characters mentioned). *A. punctifer*, id. *ibid.*, Columbia, Venezuela.

New species:—

Astacops anticus, delineatus, p. 35, *spinipes, nigricornis*, p. 36, New Guinea &c.; (*A.?*) *caligatus*, p. 36, Australia: Walker, *l. c.*

Lygæus californicus, p. 42, California; *marginalis, dimidiatus*, p. 45, Oajaca; *anticus*, p. 46, St. Domingo; *conspersus*, p. 47, Rio Janeiro; *cognatus*, Santarem, *inæqualis* (*turcicus*, Walk., olim, *nec* F.), Columbia, p. 49; *marginifer, angulifer*, p. 55, Madagascar, *inæqualis* [again!], p. 57, Silhet; *semiruber*, Hindostan, *japonicus*, Japan, p. 58; *diffusus*, p. 59, Celebes; *dispar* and varr., Batchian, Borneo; *concisus*, Lombok, p. 60; *dissimilis*, p. 61, Sarawak; *contiguus*, Moreton Bay, *subjectus*, Australia, *divisus*, N. S. Wales, p. 62; *ruficeps, singularis*, p. 63, Australia; *ruficollis*, New Zealand, *maoricus*, I. of Pines, *incertus*, locality unknown, p. 64: *id. l. c.* *L. admirabilis*, Uhler, *l. c.* p. 405, Colorado.

Nysius angustatus, Uhler, *l. c.* p. 406, Colorado, Canada; *N. raphanus*, W. R. Howard, Canad. Ent. iv. p. 219, N. America; *N. contiguus, proximus, mundus*, p. 69, Madeira, *subcinctus*, p. 70, *pallipennis*, p. 71, Ceylon: Walker, *l. c.*

Heterogaster punctosus, p. 72, *notatipes, atriclava*, p. 73, Madeira, *signifer*, Ceylon, *cymoides*, Celebes, p. 74: Walker, *l. c.*

Rhyparochromus (*Beosus*) *armatipes*, p. 91, America, (*B.*) *serripes*, Petropolis, *discifer*, Tejuca, p. 92, *R. luscinus, concinnulus*, p. 93, *glaberrimus, mundulus*, p. 94, Madeira, *circumcinctus*, p. 97, Seychelles, *leucospilus*, p. 98, Silhet, *semilucens*, N. Hindostan, *extremus*, Siam, p. 99, (*B.*) *incisus*, Ceylon, and *anticus*, Hindostan, p. 100, (*B.*) *testaceipes, leucoceras*, p. 101, Ceylon, *siamicus*, p. 102, Siam, (*B.*) *delineatus*, p. 103, (*B.*) *terminalis*, p. 105, Ceram, and *descriptus*, p. 103, Sula, (*B.*) *obscuripes*, p. 104, and *divisus*, p. 105, New

Guinea, (*B.*) *repressus*, p. 104, Celebes, (*B.*) *alienus*, p. 105, and *nigritulus*, p. 106, Sarawak, *phœophilus*, p. 106, *luteicornis*, p. 107, Celebes, *dimidiatus*, ibid., New Guinea, *coleopteroides*, Ceram, *cincticornis*, Batchian, and *R.* (? *Peritrechus*) *strictus*, Sarawak, p. 109, *rubiginosus*, Victoria, *diffinis*, Moreton Bay, p. 110, (*B.*) *maculicollis*, Adelaide, *collaris*, Tasmania, p. 111, (*Scolopostethus*) *inornatus*, p. 112, N. Zealand, (*Beosus*) *erosus*, p. 113, locality not known: *id. l. c.*

Plociomerus seychellesus [!], *reductus*, p. 120, Seychelles: *id. l. c.*

Gastrodes terminalis, id. *l. c.* p. 122, Celebes.

Ischnodemus longus, p. 127, Orizaba, *velutinus*, p. 128, Petropolis, *strigatus*, S. Africa, *basalis*, Natal, p. 130, *multilinea*, Cape of G. Hope, *varipennis*, Cambodia, p. 131, *centralis*, Ceylon, *punctatus*, N. Hindostan, p. 132, *sulcatus*, *talpa*, p. 133, Mt. Ophir, *divisus*, p. 134, N. Australia: *id. l. c.*

Ophthalmicus cinerascens, p. 138, Hindostan, *cincticornis*, ibid., *dispar*, *discifer*, p. 139, Ceylon: *id. l. c.*

Cymus trancatulus, *immunis*, id. *l. c.* p. 142, Madeira.

Thaumastopus (? g. n., characterized, but not named) *alacer*, Canaries, *alacris* [!], N. America: *id. l. c.* p. 147.

Herœus insignis, Uhler, *l. c.* p. 407, Utah, Canada, Minnesota.

Macropterna bicolor, Scott, Ent. M. M. viii. p. 193, Corsica.

Brachyplax linearis, id. *ibid.*, Corsica.

Anthocoridæ.

Anthocoris subcruciatus, p. 151, Cape of G. Hope, *proximus*, Hindostan, *pubescens*, Celebes, p. 152, *arctatus*, p. 153, Australia: Walker, Cat. Hem. Brit. Mus. pt. v., spp. nn.

Lyctocoris (?) *albifer*, sp. n., *id. l. c.* p. 154, Madeira.

Xylocoris balteatus, *latus*, p. 159, Madeira, *fulvescens*, *fumipennis*, p. 160, Ceylon: *id. l. c.*, spp. nn.

Capsidæ.

Thomson, Opusc. Ent. (iv.) pp. 410–452, revises the Swedish species, adopting various new characters. With *Capsus* he reunites *Phytocoris*, *Calocoris*, *Derœocoris*, *Megacœlum*, *Pycnopterna*, *Oncotylus*, *Dichrooscytus*, *Plesiocoris*, *Lygus*, *Hadrodema*, *Orthops*, *Camptobrochus*, *Liocoris*, *Charagochilus*, *Systratiotus* [quoted as "Dallas and Scott"], *Pœciloscytus*, *Allœotomus*, *Rhopalotomus*, *Lopus*, *Pithanus*, *Myrmecoris*, *Labops*, *Orthocephalus*, *Stiphrosoma*, *Monalocoris*, *Bryocoris*, *Brachycerœa* and *Dicyphus* (*Idolocoris*), *Cyllocoris*, *Globiceps*, *Blepharidopterus*, *Chlamydatus*, *Cyrtorhinus*, *Orthotylus*, *Litocoris*, *Malacocoris*, *Heterocordylus*, *Halticus*, *Camaronotus*, *Systellonotus*, *Cremnocephalus*, *Eroticoris*, *Phylus*, *Harpocera*, *Brachyarthrum*, *Byrsoptera*, *Atractotomus*, *Apocremnus*, *Psallus*, *Plagiognathus*, *Criocoris*, *Sthenarus*, *Agalliastes*, *Placochilus*, *Oncotylus*, *Hoplomachus*, *Mermimerus*, *Macrotylus*, and *Conostethus*, mostly genera of Fieber's, and nearly the whole of which are universally recognized, thus associating no less than 121 species from his own country alone in one cumbersome genus—a strange arrangement coming from one who stands alone in Europe in splitting the Coleopterous genus *Homalota* into very many new genera. According to him, *Capsus divergens*,

Mey., = *ulmi*, L.; *C. ulmi*, Flor., = *varipes*, Boh.; *C. annulicornis*, Sahlb., = *4-punctatus*, F.; *C. flavivarius*, Fall., = *kalmii*, L.; *C. pastinacæ*, Fall., = *transversus*, F.; *Phytocoris puncticollis*, Fall., = *Lygæus resedæ* = *didymus*, Zett.; *P. pallens*, = *Anthocoris domestica*; *C. gothicus*, Fall., *nec* L., is renamed *pilipes*, p. 429 [but *marginipunctatus*, H.-S., seems available]; *C. fairmairii*, Sign., ? = *pilosus*, Boh.; *C. mutabilis*, Fall., = *coriaceus*, F.; *C. flavinervis*, Fieb., = *virens*, Fall.; *C. diaphanus*, Fieb., = *prasinus*, Fall.; *C. angustus*, Fieb., = *diaphanus*, Flor, = *tenellus*, Fall.; *C. viridipennis*, Dbm., = *flavisparsus*, Sahlb.; *C. geniculatus*, Stål, = *salicicola*, St., ♀, = *roseri*, Scholtz; *C. signatus*, J. Sahlb., = *opacus*, Zett.

Myrmecophyes tricondyloides, Osch., = *Diplacus albiornatus*, Stål, apterous form: Oschanine, Bull. Mosc. xliv. 2, Séances, p. 3.

Teratocoris viridis, D. & S.: ♀ described, J. Buchanan White, Scot. Nat. i. p. 225.

Lygus redimitus and *diffusus*, Uhler, = *oblineatus*, Say, = *lineolaris*, Pal. de B.: Uhler, in Hayden's Geol. Surv. Montana, p. 413.

New genera and species:—

Myiomma, Puton, Pet. Nouv. no. 44, p. 177. Allied to *Isometopus*; eyes enormous, simulating certain *Diptera*. *M. fieberi*, id. *ibid.* Ste. Baume, Var.

Lopidea, Uhler, *l. c.* p. 411. *Capsus medius*, Say, of which *C. robiniæ*, Uhler, is a var.

Hadronema, id. *l. c.* p. 412. Facies of *Lopus*. *H. militaris*, id. *ibid.*, Colorado, Cheyenne.

Dacota, Uhler, *l. c.* p. 413. Allied to *Polymerus*. *D. hesperia*, id. *l. c.* p. 414, Colorado, Dakota.

Megaloceræa debilis, p. 408, *rubicunda*, p. 409, Colorado: *id. l. c.*

Leptopterna amœna, id. *l. c.* p. 409, Idaho, Dakota.

Calocoris palmeri, id. *l. c.* p. 410, Arizona.

Resthenia confraterna, id. *l. c.* p. 411, Colorado, Maryland.

Lygus annexus, id. *l. c.* p. 413, Colorado.

Pœciloscytus venaticus, p. 414, Colorado, Massachusetts, *diffusus*, p. 415, Utah: *id. l. c.*

Rhopalotomus pacificus, p. 415, Montana, *brachycerus*, p. 416, Colorado: *id. l. c.*

Labops hesperius, id. *l. c.* p. 416, Colorado, British America.

Camptobrochis nebulosus, id. *l. c.* p. 417 (? Colorado).

Litosoma atricapillum, Scott, Ent. M. M. viii. p. 194, Corsica.

Tinicephalus simplex, Uhler, *l. c.* p. 417, Colorado.

Plagiognathus obscurus, id. *l. c.* p. 418, Colorado, Maine, Maryland, Michigan, &c.

Agalliastes associatus, id. *l. c.* p. 419, Utah; *A. ochraceus* and *unicolor*, Scott, Ent. M. M. viii. p. 243, Corsica.

Macrocoleus hardii, Bold, Tr. North. Durh. iv. p. 358, Wooler, Cheviots.

Systellonotus alpinus, Frey-Gessner, MT. schw. ent. Ges. iv. (pub. in 1873), p. 21, pl. i. fig. 3, Valais.

TINGIDÆ.

Orthostira, Thomson, Opusc. Ent. (iv.) p. 398 *et seq.*, revises the Swedish species. According to him, *O. cervina*, Fieb., = *cassidea*, Fall.; *O. inter-*

media, Flor, = *platychila*, Fieb.; *O. pusilla*, Fieb., Fall., *cinerea*, Flor, = *nigrina*, Fall.; *O. obscura*, Fieb., = *parvula*, Fall.

Agramma femoralis, sp. n., *id. l. c.* p. 397, Sweden.

Monanthia ajugarum, sp. n., Frey-Gessner, MT. schw. ent. Ges. iv. (pub. in 1873) p. 21, pl. i. figs. 4 & 4*a*, Valais.

Orthostira cylindricornis, p. 401, *biseriata* and *recticosta*, p. 402, Thomson, *l. c.*, Sweden: spp. nn.

Reduviidæ.

Stål, Œfv. Ak. Förh. xxix. (1872) no. 6, pp. 43–48, revises the European genera, under the subfamilies *Reduviina*, *Piratina*, *Acanthaspidina*, *Stenopodina*, *Saicina*, *Plœariina*, and *Emesina*. The *Reduviina* consist of *Nagusta*, Stål (*N. gœdeli*, Kol., = *rugulosa*, St.), *Coranus*, Curt., *Amphibolus*, Klug, *Vachiria*, St., *Cosmolestes*, St. (type *Reduvius pictus*, Klug), *Sphedanolestes*, St. (*Reduvius pulchellus*, Klug, *Harpactor lividigaster* and *carnifex*, Muls.), *Reduvius*, F. (*Harpactor*, Fieb., *nec* Lap., which is American only), with subgg. *Reduvius* (type *H. bipustulatus*, Fieb.), *Oncauchenius*, St. (*H. annulatus*, L., and *niger*, H.-S.), and *Rhinocoris*, Hahn; the *Piratina* of *Ectomocoris*, Mayr, and *Pirates*, Serv.; the *Acanthaspidina* of *Holotrichius*, Burm., *Pasira*, St. (*Aphleps*, Fieb.), and *Opsicœtus*, Klug (*Reduvius*, Fieb., *nec* F.); the *Stenopodina* of *Pygolampis*, Germ., *Sastrapada*, Am. & S. (*Ctenocnemis*, Fieb.; *Harpagochares bœrensprungi*, St., = *C. flavescens*, Fieb.), and *Oncocephalus*, Klug (*Centromelus*, Fieb., is American); the *Saicina* of *Acanthothorax*, Costa (*Saica*, Am. & S. [why not then adopt *Acanthothoracina*?]); the *Plœariina* of *Plœaria*, Scop.; and the *Emesina* of *Metapterus*, Costa (*Carambis*, Stål; for *Emesa barbara*, Luc., and *caspica*, Dohrn), and *Cera*[*to*]*scopus*, Heinek. (*Emesodema*, Spin.).

Reviewed by Puton, Ann. Soc. Ent. Fr. (5) ii. p. 510.

Acanthiscium maculatum, A. & S., varr. nn. *flavipenne*, *maculicolle*, *plagiatum*, *fuscipictum*, *seminigrum*, *semiflavum*, *flaviceps*, *thoracicum*, *nigrum*, pp. 83 & 84; *Apiomerus flavipennis* and *ochropterus*, St., combined and renamed *proteus*; *A. hirtipes*, Hahn, renamed *nigrilobus*, p. 26; *A. guttativenosus*, *geniculatus*, *nigripes*, *rufipes*, Stål, = *rubricinctus*, H.-S., p. 98; *Conorhinus* 8-*tuberculatus*, *paulseni*, and *gracilipes*, Phil., are described from larvæ or pupæ, p. 112: Stål, Sv. Ak. Handl. x. no. 9. The author describes the following new genera and species, &c.:—

Lycimna, p. 70. Differs from *Sinea* and its allies in having the anterior acetabula closed behind. *L. annulosa*, New Granada.

Erbessus, subg. n. of *Harpactor*, Lap., p. 73. *E. validus* and *grossus*, St.

Ambastus, p. 87. Differs from *Pyrrhosphodrus*, St., in longer and unarmed head, thorax with a posterior median tubercle, structure of rostrum, non-produced scutellar apex, and more slender legs. *A. villosus*, p. 88, New Granada.

Spiniger, Burm. "Divisio prima," *Acidoparius*, p. 113, characterized, type *S. festivus*, St.; Div. secunda, *Micracidius*, p. 114, type *S. nitidiventris*, St.; Div. quinta, p. 117, also characterized, but not named, type *S. rubripictus*, H.-S.

Hoplogenius, p. 118. Nearest to *Spiniger*, but with head spinose beneath, longer anterior coxæ, and anterior tibiæ with no spongy fossa. *Reduvius obsoletus*, Blanch.

Sinea denticulosa, p. 71, New Granada.
Acholla ampliata, p. 72, Mexico.
Prionotus gallus, ibid., New Granada.
Harpactor tuberculosus, p. 73, ? Brazil.
Plæogaster (Passalentus) longicornis, p. 75, N. Brazil.
Heza ventralis, p. 76, locality unknown, *annulicornis*, p. 77, Mexico.
Ricolla nigripes, p. 77, N. Brazil.
Phorobura fusca, p. 78, Cartagena, S. America.
Fitchia spinosula, p. 79, Texas.
Castolus multicinctus, p. 81, New Granada.
Graptocleptes cingulatus, p. 81, New Granada.
Hiranetis atra, p. 82, New Granada.
Myocoris nugax, p. 83, Brazil.
Notocyrtus (Cystingonotus) depressus and *foveatus*, p. 85, *N. (Cœlocyrtus) wallengreni*, p. 86, New Granada.
Cosmoclopius annulosus, p. 87, St. Catharine's, Brazil.
Zelus cervicalis, p. 90, N. America, Mexico; *Z. (Diplodus) chamæleon*, and varr. *niger*, *marginellus*, *thoracicus*, *maculicollis*, *rubricosus*, *fasciativentris*, *cingulatus*, *lemniscatus*, p. 90, New Granada, *subimpressus*, p. 91, Cuba.
Amauroclopius bispinus, p. 95, Cayenne.
Apiomerus venosus, Mexico, *emarginatus*, New Granada, p. 97, *amazonus*, *lituratus*, *nitidicollis* and varr. *nigripennis* and *discopterus*, p. 99, N. Brazil.
Homalocoris maculicollis, p. 101, Mexico.
Mindarus sanguinosus, p. 102, N. Brazil.
Ectrichodia cinctiventris, Texas, *crucifera*, Mexico, p. 103; *E. (Rhiginia) crudelis*, St., renamed *ruficollis*, p. 103.
Pothea haglundi, p. 104, locality unknown.
Rasahus thoracicus, Mexico, *arcitenens*, Brazil, p. 106, *flavivittatus*, p. 107, New Granada.
Melanolestes picinus, p. 107, N. Brazil.
Rhodnius pictipes, p. 110, N. Brazil.
Meccus pallidipennis, p. 110, Mexico.
Conorhinus venosus, p. 111, New Granada.
Spiniger obscuripennis, S. America, *nigripennis*, Surinam, p. 113, *fulvicrus*, p. 115, ? S. Brazil, *formosus*, New Granada, *melanochrus*, locality unknown, p. 116, *ruficollis*, p. 117, ? Brazil.
Leogorrus pallipes, Brazil, *picturatus*, New Granada, p. 119.
Gnathobleda tumidula, p. 121, N. America, Cuba.
Ctenotrachelus macilentus, p. 122, N. Brazil.
Pnohirmus spinifer, p. 122, Surinam.
Rhyparoclopius annulirostris, p. 123, N. Brazil.
Spilalonius geniculatus, p. 123, Texas.

Pindus socius, sp. n., Uhler, in Hayden's Geol. Surv. Montana, p. 420, Idaho, Arizona.

SALDIDÆ.

Salda. Thomson, Opusc. Ent. (iv) p. 403 *et seq.*, revises the 20 Swedish species. According to him, *S. litoralis*, Stål, varr. *b* & *c*,=*flavipes*, F.; *luteipes*, Fieb.,=*affinis*, Zett.,=*riparia*, Fall.; *riparia*, Stål, *nec* Fall., is re-

named *bifasciata*, p. 404; *pulchella* and *bicolor*, Curt., = *lateralis*, Fall.; *marginella*, Fieb., = *opacula*, Zett.

Salda pilosella, id. *l. c.* p. 407, Sweden; *S. coriacea*, Uhler, *l. c.* p. 421, Utah, British America &c.; *S. venustula*, Scott, Ent. M. M. viii. p. 243, Corsica: spp. nn.

Hydrometridæ.

Macrovelia, g. n., Uhler, *l. c.* p. 422. General form of *Microvelia*, but much more elongated. *M. horni*, sp. n., *id. ibid.*, New Mexico, California, Arizona.

Hebrus ruficeps, sp. n., Thomson, Opusc. Ent. (iv.) p. 395, Sweden.

Notonectidæ.

Antipalocoris, g. n., Scott, Ent. M. M. viii. p. 244. Differs from *Anisops* in not having the crown elongated nor the eyes separate, and in the not decidedly different proportions of the various parts of the hind legs. *A. marshalli*, sp. n., *id. l. c.* p. 245, R. Gravone, Corsica.

Corixidæ.

Sigara fovcifrons, sp. n., Thomson, *l. c.* p. 396, Sweden.

HEMIPTERA HOMOPTERA.

Fieber, F. X. Katalog der europäischen Cicadinen, nach Originalien mit Benützung der neuesten Literatur. Wien: 1872, 8vo, pp. 19.

This posthumous list contains the names of various new species which the author did not live to describe. He recognizes 107 genera and 823 species contained in the following families:—*Membracida, Cicadæa, Fulgorida, Cercopida, Ulopida, Paropida, Scarida, Iassida.*

Fieber (Verh. z.-b. Wien, xxii. pp. 27–33) gives the results of his examination of the types of the species unknown to him, and described or referred to in Kirschbaum's 'Cicadinen der Gegend von Wiesbaden, Frankfurt a. M. und anderer Gegenden.' These results will be noticed *seriatim*, so far as they affect the validity or position of Kirschbaum's own species and genera; but the Recorder does not think it necessary to reproduce Fieber's corrections of Kirschbaum's erroneous views of species described by other authors. Fieber also (*l. c.* pp. 33 & 34) gives the results of his examination of some of Germar's types, which will be here discussed in like manner.

T. S. Bold, Tr. North. Durh. iv. pp. 369 & 370, mentions localities &c. of species new to the Northumbrian fauna.

Cicadidæ.

Cicada concinna, Germ., *exx. typp.*, = *C. atra*, Ol., and *Cicadetta megerlii*, Fieb. (*dimidiata*, Fab.): Fieber, Verh. z.-b. Wien, xxii. p. 34.

CERCOPIDÆ.

Cercopis distinguenda, Kirschb., = *Triecphora mactata*, Germ.; *C. intermedia* and *obliterata*, Kirschb., = *sanguinolenta*, L.: *id. l. c.* p. 30.

Aphrophora apicalis, Germ., *ex. typ.*, = *Philænus spumarius*, var.: *id. l. c.* p. 33.

CENTROTIDÆ.

Centrotus siculus, gallicus, italicus, turcicus, and *abbreviatus*, Kirschb., = *cornutus*, L., varr.: *id. l. c.* p. 30.

IASSIDÆ.

FIEBER, *l. c.* pp. 30-34, gives the following synonymy affecting species described by Kirschbaum:—*Acocephalus nigritus* = *interruptus*, Fieb., var.; *A. heydeni* = *Atractotypus cinctus*, Perr.; *Ac. confusus* = *polystolus*, Fieb., var.; *Eupelix zelleri* = *cuspidata*, Germ.; *Selenocephalus pallidus* = *obsoletus*, Germ.; *Iassus heydeni* = *Allygus atomarius*, Germ.; *I. atomarius* (Kb., *nec* Germ.) = *A. commutatus*, Fieb.; *I. mayri* is an *Allygus*: *I. zelleri* = *Athysanus prasinus*, Fall.; *I. longicornis* = *Thamnotettix frontalis*, H.-S.; *I. diminutus* = *Athys. interstitialis*, Germ.; *I. confusus* = *A. sordidus*, Zett.; *I. validinervis* = *A. grisescens*, Zett.; *I. guttulinervis* belongs to *Goniagnathus*, Fieb.; *I. sulphureus* = *Athys. impictifrons*, Boh.; *I. rubritinctus* and *opacus* belong to *Thamnotettix*; *I. badiellus* = *T. tenuis*, Germ.; *I. eximius* = *Parabolocratus glaucescens*, Fieb.; *I. nigricans* = *Deltocephalus penthopittus*, Am.; *I. oxypterus* = *Thamnotettix crocea*, H.-S.; *I. croceus* = *T. attenuata*, Germ.; *I. breviceps* is of doubtful stability, being mostly *flavidus*, Fieb.; *I. pallipes* = *Deltocephalus languidus*, Flor; *I. pascuellus* and *luteolus* = *D. minki*, Fieb.; *I. striifrons* ? = *D. mulsanti*, Fieb.; *I. obtusivalvis* = *D. picturatus* and *D. flori*; Fieb.; *Agallia homeyeri* = *sinuata*, Muls. & R.; *A. versicolor* (Flor) = *puncticeps*, Germ.; *Idiocerus distinguendus* ? = *cognatus*, Fieb.; *Id. vittifrons* = *tibialis*, Fieb., ♂; *Id. ochroleucus* and *minki* = *fulgidus*, F.; *Id. mesopyrrhus* = *socialis*, Frey.; *Id. prasinus* = *ustulatus*, Muls. & R.; *Bythoscopus crenatus* = *scurra*, Germ., *B. scurra* = *crenatus*, Germ.; *B. trifasciatus* = *Id. nobilis*, Fieb.; *Macropsis punctuosus* = *microcephala*, H.-S.; *Pediopsis heydeni* = *Bythoscopus alni*, Schrk.; *P. diadema* = *scutellata*, Boh., var.; *P. hippophaes* ? = *mulsanti*, Fieb.; *Typhlocyba 4-punctata* = *Notus stigmatipennis*, Muls. & R.; *T. flori* = *Notus molliculus*, Boh., and *N. facialis*, Flor; *T. manderstjerni* = *N. dilatatus*, Mus. Hal.; *T. candidula* = *Anomia nivea*, Muls. & R.; *T. heydeni* = *ornata*, Frey, ♂, and *binotata*, Fieb., ♀; *T. zelleri* = *melissæ*, Curt. Fieber indicates (p. 31) a new species of *Athysanus* (*Opsius*) under the name *heydeni*, founded on ♂ and ♀ examples in Heyden's collection, named *tamaricis* by Kirschbaum, other examples so named by the latter in Mayr and Mink's collections being *A. stactogalus*, Am. & S. He also (p. 32) names another new species (*Deltocephalus*) *heydeni*, from Mombach, erroneously named *Iassus striatus* by Kirschbaum in Von Heyden's collection.

Fieber (*l. c.* p. 34) gives the following synonymy referring to species described by Germar:—*Iassus scurra* is ♂ and *I. crenatus* ♀ of one and the same species, to be united as *Bythoscopus* (*Rhytidodus*) *germari*; *I. stigma* = *Idiocerus populi, laminatus, frontalis*, and *fasciatus* mixed, and must be abandoned; *Iassus subrusticus* = *Acocephalus albifrons*, L., *polystolus*, Fieb., and

bifasciatus; *I. frenatus* ♀ = *Athysanus striola*, Fall.; *I. albiger* ♂ = *Acoceph. polystolus*, Fieb., var.; *I. obliquus* = *Ac. ornatus*, Fieb., *bifasciatus* and *albifrons*, L.; *I. pectoralis* = *Athysanus subfusculus*, Fall.; *I. tenuis* and *attenuatus* are to be referred to *Thamnotettix* (*I. attenuatus*, H.-S., = *tenuis*, Kbm.).

Iassus (*Cicadula*) *salsolæ*, sp. n., Puton, Pet. Nouv. No. 44, p. 177, Thau.

Typhlocyba (*Zigyna*) *tamaricis*, sp. n., *id. ibid.*, Agde.

Fulgoridæ.

Dictyophora heydeni, Kbm., = *Dictyophara multireticulata*, Muls. & R.; *D. italica*, Kbm., = *europæa*, L.: Fieber, *l. c.* p. 20.

Fieber, *l. c.* pp. 28–30, gives the following synonymy affecting genera and species described by Kirschbaum:—*Pentastira* = *Oliarus*, Stål; *P. major* = *O. roridus*, var. *opalinus*, Fieb.; *Pentastiridius* = *Oliarus pallens*, Germ.; *Cixius eurypterus* = *cunicularius*; *C. distinguendus* = *simplex*, H.-S., and *stigmaticus*, Germ.; *Liorhinus* = *Hyalesthes*, Sign.; *L. albilimbatus* = *H. obsoletus*, Sign.; *Araeopus crassicornis* = *pulchellus*, Curt.; *Atropis latifrons* is a *Metropis*; *Delphax truncatipennis* = *Megamelus notulus*, Germ.; *D. major* and *colorata* = *Stenocranus fuscivittatus*, Stål; *D. smaragdula* = *Chloriona prasina*, Fieb.; *D. longipes* = *Liburnia reyi*, Fieb.; *D. punctulum* = *Kelisia pallidula*, Boh.; *D. guttulifera* = *K. vittipennis*, J. Sahlb.; *D. dubia* and *herrichi* = *Liburnia pellucida*, F.; *D. sordidula* and *fuscipennis* are *Liburniæ*; *D. albilimbata* = *L. leptosoma*, Flor; *D. obsoleta* = *L. cognata*, Fieb.; *D. nitidula* = *L. venosa*, Ger.; *D. patens* = *L. discolor*, Boh.; *D. heydeni* = *L. leptosoma*, Flor; *D. hamulata* = *L. propinqua*, Fieb.; *D. ferruginea* = *spinosa*, Mk.; *D. 4-vittata* = *Eurysa vittata*, Perr.; *Dicranotropis basilinea* = *Euides speciosa*, Boh.; *Ditropis fasciata* = *Kelisia scotti*, Fieb., var.; *Ditr. atratula* = *Iassidæus morio*, Fieb.; *Hysteropterum heydeni* = *apterum*, F.; *Tettigometra tumidifrons* = *brachycephala*, Fieb.; *T. piceola* and *læta* = *atra*, Hagb.; *T. sicula* = *virescens*, Latr., var.; *T. marginipunctata* = *picta*, M. Dür; *T. heydeni* = *costulata*, Fieb., var. *albifasciata*.

Delphax hemiptera, Germ., *ex. typ.*, = *Liburnia forcipata*, Boh., ♀; *Tettigometra umbrosa*, Germ., *exx. typp.*, = *T. obliqua*, var. *platytænia*, Fieb., and *T. vulgaris*; *Issus discolor*, Germ., *ex. typ.*, belongs to *Hysteropterum*, Spin.: *id. l. c.* pp. 33 & 34.

Aphididæ.

General observations by F. Walker, Ent. vi. p. 25 *et seq.* On reproduction in equably warm climates, *cf.* E. Blyth, *ibid.* p. 176.

P. M. Ferrari, Ann. Mus. Genov. ii. pp. 49–85, catalogues the Ligurian species, 109 in number, with synonymic and other references and notes of food-plants. He again, *l. c.* iii. pp. 209–236, discusses them, increasing their number to 134, redescribing many, and giving a fresh catalogue. *Siphonophora artemisiæ*, Koch, *nec* Boy. de Fonsc., is named *kochi*, p. 212; *Phorodon inulæ*, Pass., is queried as a form of *Rhopalosiphum hippophaes*, Koch; the winged form of *Myzus ribis*, L. (?), is described, p. 220; a var. of ? *Mizocallis quercus*, Kalt., is described and named *insignis*, p. 231, and another of *Chætophorus leucomelas*, Koch, under the name *lyratus*, p. 232; the peculiar motions of different species are recorded, p. 233, note; a var. of *Pemphigus spyrothecæ*, Pass., described and named *infaustus*, p. 235.

Phylloxera vastatrix. C. V. Riley, iv. Rep. Ins. Mo. pp. 55–71, fig. 28, describes and figures the earlier stages &c., under the earlier name of *P. vitifoliæ*, Fitch, which he thinks must give way to the more correct and better-known one of *vastatrix*, Planchon. The author gives further proofs of the identity of the American and European insects, and of the "leaf-gall louse" with that found in the root. The habits of the latter are fully discussed, and fresh facts as to its economy recorded; the susceptibility of many different vines to attack, and the means of contagion, being stated in detail. European vines are supposed to succumb more readily than American, because they are of a more highly improved and tender character, and, the disease being in Europe of recent introduction, are not descended from sturdy plants that have withstood or survived the infection in former years. Practical suggestions are given for preventing contagion; and various remedies are enumerated, of which carbolic acid seems the most satisfactory. A new species (*P. rileyi*, Lichtenstein, MS.), from leaves of American "post-oak," is indicated, p. 66, note.

A general account by Gervais, J. Zool. i. pp. 112–120, figs. 1–4.

Guérin-Méneville, R. Z. (2) xxiii. pp. 458–462, summarizes recent observations, adhering to his opinion that this insect is only a secondary agent, the consecutive phenomenon of a profound malady in the vine.

A. Müller, Canad. Ent. iv. p. 167, quoting the Report of Scientific Committee of Royal Horticultural Society as to loss occasioned by this species to vineyards in Portugal, considers national cooperation required in order to check its further progress.

Observations on its ravages in Swiss vineyards by Stierlin, MT. schw. ent. Ges. iii. p. 434.

Von Frauenfeld, Verh. z.-b. Wien, xxii. pp. 567–572, refers generally to this pest, and especially as to its occurrence in Germany.

Boisduvalia lataniæ, Sign., is an *Aphis* infested by gregarines: Leprieur, Bull. Soc. Ent. Fr. (5) ii. p. xxx.

Psylloptera, g. n., Ferrari, *l. c.* ii. p. 85. *Chermesinæ*: antennæ short, 4-jointed (winged ♀), last joint bisetulose; wings horizontal, anterior with a costa and stigma, the cubital and radial veins each with a single fork; no veins to posterior wings; no nectaries or tail; tarsi with 2 hooks. *P. quercina*, sp. n., *id. ibid.*, Stazzano, on *Quercus cerris*.

Siphonophora dubia, p. 55, Stazzano, on *Artemisia campestris*, *S. inulæ*, p. 57, Genoa, on *Inula viscosa*, *S. atra*, p. 58, on *Artemisia camphorata*, Genoa and Stazzano, Ferrari, *l. c.* ii.; *S. leucanthemi*, p. 214, Stazzano, on *Leucanthemum vulgare*, *S. lilacina*, p. 216, Serravalle, on *Tanacetum vulgare*, id. *l. c.* iii.: spp. nn.

Phorodon pruni, sp. n., *id. l. c.* ii. p. 69, Genoa, on *Prunus mahaleb*.

Aphis holci, p. 62, Genoa, on *Holcus mollis*, *A. spectabilis*, p. 64, Serravalle Scrivia, on *Salix*, *A. helianthemi*, p. 65, Stazzano, on *Helianthemum vulgare*, *A. convolvulicola*, p. 66, Stazzano, on *Convolvulus arvensis*, *A. vicitis*, p. 67, Genoa, on *Vicitis agnicasti*, *A. coronillæ*, p. 69, Stazzano, on *Coronilla pusilla*, *A. brunnea*, p. 70, Stazzano, on *Ononis natrix*, *A. silenea*, p. 72, Stazzano, on *Silene inflata*, *A. jani*, p. 73, Genoa: *id. l. c.* ii.; *A. vitalbæ*, p. 225, Stazzano, on *Clematis vitalba*, *A. cirsina*, p. 226, Diano Marina, on *Cirsium arvense*, *A.* (?) *mimosæ*, p. 227, Genoa, on *Mimosa*, *A. arbuti*, p. 228, Genoa, on *Arbutus unedo*, id. *l. c.* iii.: spp. nn.

Pterocallis pictus, sp. n., *id. l. c.* ii. p. 77, Genoa.

Lachnus longitarsis, sp. n., *id. l. c.* ii. p. 80, Stazzano, on *Artemisia campestris*, id. *l. c.* iii. p. 233, on *Phaseolis vulgaris*.

Rhopalosiphum elegans, sp. n., *id. l. c.* iii. p. 217, Genoa, on *Salvia rectiflora*.

Myzus mali, p. 221, Terrazzi, on *Pyrus malus*, *M. pyrinus*, p. 222, Stazzano, on *P. communis*, id. *l. c.* iii.: spp. nn.

Pemphigus diani, sp. n., *id. l. c.* iii. p. 234, Diano Marina.

Coccidæ.

Signoret, Ann. Soc. Ent. Fr. (5) ii. pp. 33–46, pl. 7 (pt. ix. and pl. 9 of the treatise as a whole) continues his 'Essai sur les Cochinelles,' discussing the genera *Vinsonia* and *Ceroplastes*. One of the *Lecaniides*, found on a leaf of *Mangifera indica* with *V. pulchella*, Sign., is queried as possibly the ♂ of that species. *Ceroplastes radiatus*, *testudineus*, and *hydatis*, Costa, united rightly by Targioni as forms of one species, under the name *testudiniformis*, must retain the name of *rusci*, L., and *Lecanium artemisiæ*, Rossi, is possibly identical with it. Various stages of this insect are figured. A species of *Ceroplastes* from the Mauritius, living on *Eriobotrya japonica* and *Psidium*, is described as new (p. 38) under the name *vinsoni* (fig. 2), and is also queried as being a form of *C. psidii*, Chav., or *janeirensis*, Gray, or possibly of *C. myricæ*, L. Details of *C. ceriferus*, Anders. (fig. 3), and *psidii*, Chav. (fig. 6), are given, the latter being queried as a var. of *janeirensis* (fig. 4). *C. fairmairii*, Targ. (fig. 7), *cassiæ*, Chav., *chilensis*, Gray (fig. 5), *jamaicensis*, White (?=*janeirensis* and *psidii*), and a species from Egypt, occurring on *Mimosa nilotica*, and briefly described (p. 46) under the name *mimosæ*, are also noticed. The same author (*ibid.* Bull. p. xxxv *et seq.*), referring to species observed by him in S. France and Italy, incidentally mentions two supposed new species under the names *Antonia purpurea* and *Fairmairia bipartita*, and others to which no names are assigned. He also briefly redescribes *Lecanopsis rhyzophylla*, Targ., and mentions various species found on *Genista*, *Mesembrianthemum*, &c. *Coccus vitis*, according to his experience, does not hibernate at the roots of the plant. [The semicolloquial and unscientific treatment employed renders an analysis of this work extremely difficult.]

Ceroplastes mimosæ, Boisd., and a new *Lecanium* from *Viburnum tinus*: id. *ibid.* pp. xlvii & xlviii.

Both sexes of *Aspidiotus visci*, Löw, = *Diaspis* (*Coccus*) *visci*, Schrank, from the mistletoe, Vienna, are fully described (with account of economy) and figured, with details of external anatomy, by Löw, Verh. z.-b. Wien, xxii. pp. 273–278, pl. iv. The subfamily *Diaspides* is briefly characterized, and *Aspidiotus*, *Diaspis*, *Chionaspis*, *Fiorinia*, *Parlatoria*, *Mytilaspis*, *Leucodiaspis*, *Aonidia*, and *Targionia* are referred to it.

Coccus vitis colonizing a gooseberry-bush in Northumberland: T. J. Bold, Tr. North. Durh. iv. p. 370.

Dorthesia characias, Latr.: egg-nidus (doubtfully referred to this species) described: *id. ibid.*

VERMES

BY

C. F. LÜTKEN, Ph.D., F.R.D.A., &c.

I. ROTATORIA.

1. HUDSON, C. T. On *Pedalion mira*. Q. J. Micr. Sci. xii. pp. 333–338, pl. 19.

2. LANKESTER, E. RAY. Remarks on *Pedalion*. Ibid. pp. 338–342.

3. MARION, M. A. F. Rotateurs parasites des Nébalies. C. R. lxxiv. p. 1115.

4. SALENSKY, W. Beiträge zur Entwickelungsgeschichte des *Brachionus urceolaris*. Z. wiss. Zool. xxii. pp. 455–466, pl. 38.

5. SEMPER, C. Zoologische Aphorismen. III. *Trochosphæra æquatorialis*, das Kugelräderthier der Philippinen. Ibid. pp. 311–322, pl. 24.

SALENSKY's paper (4) is important, as contributing the first illustration of the evolution of a Rotatorian and its external and internal organs. Of the first two cleavage-cells of the egg, the smaller builds up the external, and the greater the internal cellular layer of the embryo. From the first of these the foot, velum, shell, nerve-ganglion, and armed pharynx are formed, from the second the other internal organs; the muscles originate from an intermediate layer, making its appearance at a rather late period. The first stages of the male embryo correspond entirely with those of the female, but in the place of the other internal organs only a gigantic *testis* and the "primordial kidney" are developed from the endoblast.

HUDSON (1) figures the remarkable new Rotifer *Pedalion* (female), with a circle of six movable, but non-articulate, feathered "limbs"; also the much reduced male and the strongly transversely striated muscular system.

LANKESTER (2) speculates ingeniously on the part possibly played by this type in the developmental series leading from *Annulata* to *Arthropoda*, pointing out the (rather slight) analogies between the limbs in *Pedalion*, the arms in the male *Asplanchna*, and the movable spines of *Polyarthra* and *Triarthra*.

MARION (3) announces the discovery of a new parasitic Rotatorian of the

genus *Saccobdella*, which lives attached to the branchial feet of *Nebalia straussi* in the gulf of Marseilles.

Trochosphæra, g. n., Semper (5). A very remarkable form, spherical, apodal, free, pellucid, revolving, circumscribed by a median ciliated band, dividing its surface in two equal hemispheres:—one aboral (almost devoid of all organs, answering to the front in *Ploscularia*); the other oral, in which all interior organs are situated. The ciliated mouth lies close below the ciliated band; the pharynx (armed with jaws), œsophagus (with which a salivary gland communicates on either side), stomach, rectum, cloaca, and anus are demonstrated; in the cloaca two secretory organs (? kidneys) and an oviduct also open. Muscles are only developed in a few places. A nerve-ganglion close above the pharynx supplies two eyes and three symmetrically disposed organs of sense (?) with nerves. As eggs and embryos were observed, but neither males nor spermatozoa, the author presumes that he only met with the parthenogenetic generation. *T. æquatorialis*, in ditches between rice-fields, Zamboanga.

II. CHÆTOPODA.

1. Allman, E. J. On the structure and development of *Mitraria*. Q. J. Micr. Sci. xii. p. 392.

2. Eisen, G. Om några Arktiska Oligochæter. Œfv. Ak. Förh. 1872, No. 1, pp. 119–124, pl. 2.

3. Grube, E. Mittheilungen über St. Vaast-la-Hougue und seine Meeres- besonders seine Annelidenfauna. Abh. schles. Ges. 1868–1869, pp. 91–128, pl. 2.

4. ——. Mittheilungen über St. Malo und Roscoff, und die dortige Meeres- besonders die Annelidenfauna. Ibid. 1869–72, pp. 75–146, pls. 1 & 2.

5. ——. Ueber neue Arten der Gattung *Sabella*. Ueber die Amphicteneen und Amphareteen, Mgr. Ueber zwei neue Heteronereis-Formen und Pycnogoniden. JB. schles. Ges. 1870, pp. 67–86.

6. ——. Ueber die Gattung *Lycastis*, und ein Paar neue Arten derselben; z. kritischen Uebersicht der bisher beschriebenen Terebellen und über *T. anguicomus* und einige Serpulaceen; Vorlage einer *Lumbriconereis gigantea*, Q., einer neuen *Œnone*, &c. Ibid. 1871, pp. 47–58.

7. Lespès, C. Études anatomiques sur un Chætoptère. Ann. Sc. Nat. (5) xv. no. 14, pl. 4.

8. Marion, M. A. F. Sur les organes reproducteurs de l'*Oria armandi*, Cl. C. R. lxxiv. pp. 1254–1256.

9. M'Intosh, W. C. On the abyssal theory of light, the protozoic absorption-theory, and the azoic-mud theory, propounded in the Reports of H.M.S. 'Porcupine,' 1869–70. Ann. N. H. (4) ix. pp. 1–12.

10. Perrier, M. Résumé des recherches anatomiques sur les Lombriciens terrestres. C. R. lxxiv. pp. 754–760.

11. ——. Recherches pour servir à l'histoire des Lombriciens terrestres. Arch. Z. expér. i. pp. lxx–lxxxi.
Abstracts of a larger memoir in N. Arch. Mus. viii. (1873).

12. ——. Histoire naturelle du *Dero obtusa*. Arch. Z. expér. i. pp. 65–96, pl. 1.

13. Sars, G. O. Diagnoser af nye Annelider fra Christianiafjorden. (From the manuscript notes of the late Prof. M. Sars.) Forh. Selsk. Chr. 1871, pp. 406–417.

14. ——. On some remarkable forms of animal life from the great deeps off the Norwegian coast. I. (Also partly from posthumous papers of M. Sars). Christiania: 1872 (University programme).

Distribution, Local Lists, &c.

Sars (13) gives the diagnoses of eighteen new species and four new genera from Christiania-fjord; their names and generic characters are given below; those marked * are more fully described and figured in a paper dated 1873.

Eisen (2) notices four species of earthworms from Newfoundland, all European (*Lumbricus terrestris*, L., *rubellus*, Hofm., *puter*, H., and *Rhynchelmis obtusirostris*, Menge); two from Greenland (*Lumbriculus variegatus*, Müll., and *Enchytræus pagenstecheri*, Ratz.).

Nicholson, Ann. N. H. (4) x. pp. 277–287, notices three *Oligochæta* as dredged in Lake Ontario.

Lacaze-Duthiers gives practical hints for detecting and disinterring *Chætopteri* and *Myxicolæ* on the coasts of France. Arch. Z. expér. i. pp. xvii–xxiv.

Lafont contributes a list of twenty-three *Annulata* observed at Arcachon. Act. Soc. L. Bord. xxviii. pp. 262–265.

To Grube (3 and 4) we are indebted for a detailed account of his zoological excursions to the coast of Western France, with many intercalated descriptions and biological notes on the *Annelida* observed, remarks on synonymy &c., and complete lists of the species collected at St. Vaast-la-Hougue, Roscoff, and St. Malo. The new species and the reductions in the systematic catalogue of species described, resulting from the discovery of their identity with others, are recorded below.

Fischer and Folin have published (C. R. lxxiv. pp. 750–753) a short account of the most important types of lower animals characteristic of the various zones, from 24–250 fathoms, off Cape Breton.

In Metzger's "Die wirbellosen Thiere der ostfriesischen Küste," pt. 2, 1871, a few additions to the Annelidan fauna of the north German shores are made.

Cf. also Verrill "On the distribution of marine animals on the southern coast of New England," Am. J. Sc., Nov. 1871, and Ann. N. H. (4) ix. pp. 92–97, for a few notes on the Annelids of the deeper and colder area; and Greeff's 'Madeira und die canarischen Inseln in naturwissenschaftlicher

besonders zoologischer Beziehung' (Marburg: 1872), for a short notice of the marine worms of the Canaries.

Sars gives an interesting sketch of the lower animal life on the submarine banks ("Stor-Eggen") that follow the Norwegian coast at a rather considerable distance, in a depth of 80 fathoms, separated from the mainland by a broad sheet of water, enumerating the different species (*Crustacea, Annulosa, Mollusca, Tunicata, Polyzoa, Echinodermata, Cœlenterata*) which inhabit, 1, the deep water outside the "edge," at 400 fathoms; 2, the reef itself, at a depth of 80–100 fathoms; and, 3, the sea-bottom inside the reef, at 50–60 fathoms. The new species are recorded below. This author also gives an admirable sketch of the animal life in one of the deep "fjords" of western Norway, in the introductory part of which he records the occurrence of several mollusks, worms (10), 1 Echinoderm, and 16 Rhizopods at 500 fathoms in the innermost part of the Hardanger-fjord. Forh. Selsk. Chr. 1871, p. 252 *et seq.*; *l. c.* 1872, pp. 73–119.

65 Annelids, 3 *Chætognatha* (*Sagitta*), 2 *Acanthocephala*, 4 *Nematoda*, 6 *Cestoida*, 3 *Trematoda*, and 67 *Turbellaria* observed in the Black Sea are noticed by Basil Ulianin in his "Materials for a fauna of the Black Sea" (in Russian), 1872, 4to, pp. 53–58.

Anatomy, Evolution, &c.

Greeff, SB. ges. Marb. 1872, p. 106, gives a preliminary account of the anatomy of *Thalassema* and *Echiurus*.

Kowalewsky, Z. wiss. Zool. xxii. p. 284, publishes short notes on the respiratory and generative organs of *Thalassema*, and the evolution of the embryo into a larva of the "Lovenian" type.

Allman (1) contributes a short note on the development of a *Mitraria* in the gulf of Spezzia, and the differences between it and the species studied by Metschnikoff.

Marion (8) describes the testes and ovaria in *Oria armandi* and in a new Annelid of the family *Maldaniæ* as provided with a distinct enveloping membrane and recalling those of *Enchytræus* and *Tubifex*. The circulatory system in *Oria* (recalling that of *Amphiglene mediterranea*) is also described.

Perrier (12) has published a careful anatomical investigation of *Dero obtusa*.

Vaillant's paper (Zool. Rec. viii. p. 450) on the anatomy and acclimatization of *Perichæta diffringens* is translated in Ann. N. H. (4) ix. pp. 322–324.

Criticizing the theory "that the abyssal regions might depend solely for their light upon the phosphorescence of their inhabitants, and that this luminosity in the dark abysses of the sea fulfils, in regard to the great object of the supply of food, the functions performed in the upper world by the light of day," M'Intosh (9) contributes an interesting series of observations on luminosity in (*Hydrozoa* and) *Annulata* of the littoral and laminarian zones (*Chætopterus, Harmothoe, Polynoe, Eunoe, Eusyllis, Aphlebina*), most of which are tubicolar or of concealed habitat. In discussing the "protozoic-absorption theory," remarkable tenacity of life is noticed in *Eunice norvegica* (and *Lineus marinus*), preserved alive for years without food in small quantities of sea-water. In opposition to the theory that turbidity of the water could explain the want of life in the greater depths of the Mediterranean, it is pointed out that many

worms and other animals of the lower tribes affect a muddy bottom and thrive well in putrid ooze.

Genera and species.

Onychophora. Saenger has published (in Russian) a minute anatomical investigation of *Peripatus capensis* and *P. leuckarti*, sp. n., with two plates (Moscow: 1870). The Recorder regrets his inability to deal with this paper as it would apparently deserve, if written in a language of Gothic or Latin origin.

Polynoidæ.

**Lænilla? mollis*, sp. n., Sars (13, p. 406), Christiania-fjord, 40–50 fath.

Nychia globifera, sp. n., *id.* Forh. Selsk. Chr. 1872, p. 95, Lofoden Isles and off Storeggen, 300–400 fath.

Hermadion [?] *hyalinus*, sp. n., *id. l. c.* p. 96, Storeggen, 80–100 fath.

Amphinomidæ.

Paramphinome, g. n., Sars. Corpus vermiforme, modice elongatum, segmentis paucis. Lobus cephalicus parvus, postice productus, caruncula vero nulla distincta. Oculi nulli. Tentacula capitis 5 brevia, cylindrica, forma et magnitudine subæqualia, unum medianum in parte postica, 2 anteriora et 2 lateralia. Cirrus dorsalis et ventralis in 1^mo^ segmento distincti, elongati, forma tentaculis similes, in ceteris rudimentarii. Os fissuram longitudinalem labiis 4 carnosis circumdatum formans; proboscis brevis et crassa, apice irregulariter lobato, maxillis vel dentibus nullis armato. Anus terminalis. Pedes biremes, remis minimis et longe sejunctis, superiore subdorsali, setis tenuissimis capillaribus, aliis multo brevioribus et robustioribus interpositis, inferiore laterali, setis plerumque obsolete bidentatis, dente altero brevissimo, altero (apice) tenuissimo, margine altero subtiliter dentato, nonnullis multo brevioribus et robustioribus prope apicem dilatatis et ut illis inæqualiter bidentatis. Hamuli præterea adsunt 2 validissimi chitinosi in remo dorsali segmenti 1^mi^ setigeri. Branchiæ sat magnæ dichotomæ, totum fere dorsum tegentes, in segmentis vero paucis (4–6) corporis per paria obviæ in segmentis et anterioribus et posterioribus omnino deficientes. *P. pulchella*, sp. n., Sars (14, p. 45, pl. iv. figs. 19–35), from the shores of Norway, 20–300 fath., mud bottom.

Eunicidæ.

**Onuphis quadricuspis*, sp. n., Sars (13, p. 407), Christiania-fjord, 30–120 fath., Lofoden I. (to 300 fath.); *Œnone vitiensis*, sp. n., Grube (6, p. 58), Fiji Islands; *Lumbriconereis gigantea*, Qu., is made the type of a separate genus, *Maclovia*, Grube (*l. c.*, 4, p. 86); *L. latreillii* = *L. nardonis*, Grube (3, p. 126); *Lysidice punctata*, R., = *L. mahagoni*, Cl., = *L. torquata*, Qu., = *L. ninetta*, A. E.

Nereidæ.

Lycastis littoralis and *L.* (*Paranereis*) *abiuma*, spp. nn., Grube (6, p. 47) Brazil (Desterro). The *Heteronereis* state of *Nereis marioni* and *N. costæ* also shortly noted: *id.* (5, p. 84); *N. fucata*, Sars, = *N. bilineata*, Johnst.; *N. bilineata*, Qu., = *N. cultrifera*, Gr.: *id.* (3, p. 126).

Nephthyidæ.

Nephthys margaritacea, J., = *N. cæca*, Fabr.: Grube (3, p. 126).

Phyllodocidæ.

Phyllodoce griffithsi, J.,=*Eulalia punctifera*, Gr.: *id. l. c.*

**Eteone fucata*, sp. n., Sars (13, p. 407), Christiania-fjord (60 fath.).

Syllidæ.

Umbellisyllis, Sars, g. n. Corpus vermiforme, haud longum, segmentis brevibus, cirris 2 analibus. Lobi capitis frontales minuti, late distincti; oculorum paria 2, anteriora minuta, et ante hos puncti oculares 2 minimi; tentacula 3 æqualia subcylindrica brevissima, non moniliformia: duo anteriora ad sulcum lobos frontales a capite separantem posita, tertium postice in medio vertice. Tentacula 2 oralia iisdem capitis simillima, in segmento buccali ad latera oris posita. Cirri tentaculares nulli. Pedes uniremes, setis compositis spinosis muniti; cirro dorsali elongato non moniliformi, a pede remoto, lateri corporis affixo; cirro ventrali brevissimo ad apicem pedis sito. Margo occipitalis lamina munitus cutacea sub-semilunari, transversa, ciliata, margine inferiore medio adnata ceteroquin libera et supra basin lobi cephalici prominente. *U. fasciata*, Sars (14, p. 41, pl. 4. figs. 12–18), from the northern, western, and southern shores of Norway, 40–300 fathoms.

Sylline flava and *Grubea adspersa*, spp. nn., Grube (3, pp. 126 & 127).

Chætopteridæ.

Lespès (7) describes the external and internal organization of *Chætopterus brevis*, sp. n., allied to *C. norvegicus*, found at a depth of 15–20 fathoms, attached to rhizomes of *Zosteraceæ* on the coast of Provence, and remarkable for the facility with which it could be kept living in captivity.

Ariciidæ.

**Aricia norvegica*, sp. n., Sars (13, p. 407), Christiania-fjord (50–120 fath.), Lofoden Isles (90–100 fath.).

Spionidæ.

**Prionospio plumosus*, id. *l. c.* p. 410, Christiana-fjord (50–60 fath.); **Spiophanes cirrata*, id. *ibid.*, Christiania-fjord (25–30 fath.), Lofoden Isles (90–100 fath.): spp. nn.

Chloræmidæ.

**Trophonia flabellata*, id. *l. c.* p. 409, Christiania-fjord (40–50 fath.), Lofoden Isles (120–300 fath.); **Chloræma pellucidum*, id. *ibid.*, shores of Norway, littoral to 80 fath., spp. nn.

Maldanidæ.

Clymene planiceps, p. 411, Christiania-fjord (40–60 fath.), Hardanger-fjord (15 fath.), *drœbachiensis*, Christiania-fjord (40–50 fath.), and *affinis*, Christiania-fjord (20–30 fath.), p. 412: *id. l. c.*, spp. nn.

Petaloproctus terricola, Q.,=*P. spathulatus*, Gr.: Grube (3, p. 127).

Lumbri[co]clymene, g. n., Sars. Corpus vermiforme, subcylindricum, segmentis 24–25, quorum 18–19 setigera, mediis longissimis, 4 anteanalibus nudis. Lobus cephalicus a segmento buccali biannulo sulco transverso bene distinctus, ovalis, inclinatus, haud limbatus. Setæ superiores, fasciculum componentes, capillares, læves, arcte limbatæ; setæ inferiores uncini: in segmentis 4 anticis setigeris solummodo unicus obvius, validus, conico-acumi-

natus, in ceteris multi minuti, seriem simplicem transversam formantes, rostrati, vertice rostri serrulato. Segmentum anale elongatum, cylindricum, postice paulo oblique truncatum, ano terminali subdorsali, cirris analibus nullis. *L. cylindricauda*, sp. n., Sars (13, p. 413), Dröbak (40–60 fath.).

Amphicteneæ (and *Ampharetеæ*).

Grube (5, p. 68 *et seq.*) gives a synopsis, with critical and descriptive remarks on genera and species. *Pectinaria catharinensis*, Desterro, and *malmgreni*, Trieste, spp. nn., *id. l. c.*

Terebellidæ.

Streblosoma, g. n., Sars. Corpus vermiforme, subteres, postice paulo sensim attenuatum. Lobus cephalicus brevis truncatus, antice tentaculis numerosis elongatis canaliculatis, postice punctis ocularibus nullis. Segmentum buccale primum, orem subtus circumdans, nudum. Branchiæ filiformes dorso segm. 2–3–4^{ti} affixæ, haud ramosæ, utrinque in serie contigua transversa dispositæ. Fasciculi setarum capillarium modo in anteriore corporis parte, in segm. 28–34 obvii, in segm. 2do (primo branchifero) incipientes, e tuberculis elongatis pinnuliformibus prodeuntes. Tori uncinigeri in segm. 5to (4to setigero) incipientes, breves, ovales, pone ultimum segm. setigerum in pinnulas mutati. Setæ capill. leviter curvatæ, anguste limbatæ, acuminatæ. Uncini breves aviculares, vertice uni- vel indistincte bi-dentato, uniseriales. Scuta ventralia in segm. anticis conspicua, latissima. Tubus liber, teres, arenulis aut limo obductus, aut irregulariter flexuosus tortusque aut spiraliter in anfractus regulares convolutus. *S. cochleatum*, Sars (13, p. 414), Christiania-fjord (40–50 fath.), *intestinale*, id. (*l. c.*), Christiania-fjord, (25–60 fath.), Lofoden I. (50 fath.).

Terebella (*Neottis*) *strepsibranchis*, *T. hæmatina* (Brazil, Desterro), *T.* (*Loimia*) *annulicornis* (also script. *annulifilis*) (Fiji Isl.), *T. stenotænia* (Moreton Bay), *T. thuja* (loc. ?), *T. subcirrata* (= *T. megalonema* ?, Reise v. Novara), and *T.* (*Neottis*) *paulina*, sp. n. (St. Paul), Grube (6, pp. 48–50). *T. variegata*, Ehrbg., = *T. medusa*, Sav.; *T. lutea*, Risso, = *T. danielseni*, Mgr.; *Heterote rebella sanguinea*, Cl., = *T. rosea*, Gr.; *Terebellides anguicomus*, M., redescribed by Grube, *l. c.* p. 51.

Thelepodopsis, g. n., Sars. Corpus vermiforme, subteres, postice sensim paul'o attenuatum. Lobus cephalicus brevis, truncatus, antice tentaculis numerosis canaliculatis, margine angusto pone tentac. punctis numerosis fusco-nigris (oculis dictis) sparsis. Segm. bucc. nudum. Branchiæ filiformes dorso segm. 2^{di} 3^{tii}que adnatæ haud ramosæ, utrinque in serie transversa contigua dispositæ. Fasciculi setarum capill. modo in anter. corporis parte, in segm. 28–33 obvii, in segm. 3^{tio} (2do branchif.) incipientes, mediocres, elliptici, pone ultimum segm. setig. in pinnulas mutati. Scuta ventralia in segm. ant. latissima, a toris uncinigeris parum discreta. Setæ capill. anguste limbatæ, acuminatæ. Uncini breves avicul., vertice unidentato. Tubus liber cylindricus fragilis subrectus aut parum curvatus, e quisquiliis (fragmentis testaceorum frustulisque algarum sæpe longe prominentibus) confectus, ideoque maxime hispidus. *T. flava*, sp. n., Sars (13, p. 415), Christiania-fjord (40–50 fath.).

Sabellidæ.

Chone longicirrata, Sars, *l. c.* p. 415 (40–50 fath.), and *Dasychone inconspicua*, id. p. 416 (50–60 fath.), Christiania-fjord.

Sabella (*Dasychone*) *cingulata* (Fiji Isl.), *S. samoensis* (Samoa), *S.* (*Potamilla*) *cerasina* and *tenuicollaris* (Adriatic), *S. scoparia* (Uea): Grube (5, p. 67–68), spp. nn.

Sabella voluticornis, Mont.,=*S.* (*Distylia*) *punctata*, Qu., Grube, *l. c.* p. 68; *S.* (*Dasych.*) *argus*=*dalyelli*, Köll., *polyzonos*, Grube, *verticillata*, Qu.: Grube (3, p. 128).

Serpulidæ.

Protula borealis, sp. n., Sars (13, p. 417), Norway (30–300 fath.).

P. pivanga, sp. n. (Desterro, Brazil), with *Spirorbis brasiliensis*, sp. n., and *Hydroides dirampha*, Mörch: Grube (6, pp. 51 & 52).

Oligochæta.

Dero obtusa investigated anatomically and figured by Perrier (12); the same author's new genera *Digaster*, *Acanthodrilus*, *Rhinodrilus*, and *Titanus* (10) date from 1872, but will be better noticed in Zool. Rec. x.

Enchytræus pagenstecheri, Ratz. (from Greenland), and *E. ratzeli*, sp. n. (Tromsö), are described and figured by Eisen (2).

Echiuridæ.

Thalassema barronii, sp. n. (Canaries, Arecife), Greeff, SB. ges. Marburg, 1872, p. 106.

According to Kowalewsky, *l. c.*, the male *Bonellia* is a *Planaria*-like animalcule, 1½–2 millim. long, which lives in the female generative organs!

III. DISCOPHORA.

1. Philippi, R. A. *Macrobdella*, ein neues Geschlecht der Hirudineen. Z. ges. Naturw. (2) vi. pp. 439–442, pl. 3.

2. Verrill, A. E. Descriptions of North-American freshwater leeches. Am. J. Sc. (3) iii. p. 126.

Jensen enumerates 10 species of freshwater leeches from Southern Norway: N. Mag. Naturw. xix. pp. 154–186.

Grube notices 2 species of *Clepsine* as new to the Silesian fauna: JB. schles. Ges. 1871, p. 56.

Verrill (2) describes 10 new species of leeches, mostly from Connecticut: *Cystibranchus vividus* (on *Fundulus pisculentus*, also in salt water among *Zosteræ*), *Ichthyobdella funduli* (on the same fish), *Clepsine picta*, *modesta*, *ornata*, *papillifera*, *pallida*, *elegans*, *Nephelopsis* (g. n.) *obscura*, *Hexabdella* (g. n.) *depressa* and *Macrobdella* (g. n.) *decora*, Say. *Clepsine parasitica* (Say) *Nephelis quadristriata*, Grube, and *N. lateralis*, Say, are also described.

Nephelopsis, Verrill (2, p. 135). Body broad and flattened behind the clitellus, rounded and tapering in front of it. Upper lip large, dilated, wrinkled, and radially sulcated beneath; œsophagus with 3 broad folds, jaws absent. Intestine simple. (Ocelli 8.) External male organ expanded at the end into a disk-like form with a raised margin and depressed centre, in which there is a four-lobed orifice. Testicles 11 (?) large rounded or pyriform vesicles on each side.

Hexabdella, id. *l. c.* p. 136. Body depressed posteriorly, cephalic lobe

prolonged, composed of 4 segments, with 3 longitudinal folds beneath followed by 3 transverse fleshy lobes or folds; below these the œsophagus is furnished with 6 longitudinal plications. Ocelli 10; 4th pair on the buccal segment, 5th on the 2nd behind the buccal. Anus dorsal, posterior. Acetabulum round, separated from the body by a deep constriction.

Macrobdella, id. *l. c.* p. 137. Body strongly annulated, stout, broad, depressed throughout, tapering but little. Cephalic lobe large, rounded, composed of 5 segments, its lower surface rugose with longitudinal sulcations, at its base a transverse fold, forming sockets for the maxillæ when retracted; max. 3, stout and prominent, denticulate, with about 50–60 teeth. Nine plications within the œsophagus. Stomach voluminous, divided into compartments, with large irregular pouches on each side. Ten eyes. Male orifice between the 26th and 27th segm. behind the mouth; vulva between the 31st and 32nd; anus dorsal, posterior.

Macrobdella valdiviana, Philippi (1). A gigantic leech from Valvidia, 2½ feet long (extended); 92 rings, the first 14 forming a narrow cylindrical neck, the others broad; back convex; belly flat; lateral margins serrate from transverse dorsal ridges. Mouth terminal, small, orbicular, destitute of lips, teeth, jaws, or folds; no eyes. Genital openings after the 32nd and 37th ring. Sucker posterior, turned towards the belly. Lives probably in the earth, feeding on earthworms. [A new generic name will probably be necessary, Verrill's type having priority.]

Pontobdella papillata, Grube (Australia): JB. schles. Ges. 1871, p. 56. A list of new *Hirudineæ* from Lake Baikal (*cf.* Zool. Rec. viii. p. 455) is contained in the same author's lecture on the fauna of that lake (*l. c.* pp. 53–57).

Aulastomum lacustris [*Aulostomum lacustre*], Leidy, swarms in a lake in Wyoming Territory (? also in Lake Superior). Leidy, in Hayden's Geol. Survey Montana, p. 382.

IV. TURBELLARIA.

1. Grube, E. Beschreibungen von Planarien des Baikalgebietes. Arch. f. Nat. xxxviii. pp. 273–292, pls. 11 & 12.

2. Fedchenko, A. P. Zoologitjeskija Samjetki. I. Prjsnovodnie Nemertini. (Moskva: 1872.) pp. 12, 2 pls. (Trans. Imp. Soc. Natur.)

3. Vaillant, Léon. Remarques sur le développement d'une Planarie dendrocœle, le *Polycelis lævigatus*, Qu. Mém. Ac. Montp. vii. (1868), pp. 93–108, pl. 4.

Grube describes (1) a collection of freshwater *Planariæ* from considerable depths in Lake Baikal, partly remarkable for coloration and colossal size; they all belong to the group with 1 genital pore, the mouth in or behind the middle of the belly; pharyngeal tube cylindrical where observed. In most of them the eyes were only visible in young specimens; in a few (*Sorocelis*, subg. n.) they formed a single, double, or triple arch on each side; two are provided with suckers on the front margin, none with tentacular prolongations. *Planaria hepatizon*, *P.* (*Anocelis*) *tigrina*, *pardalina*, and *lanceolata*, Gr.; *P.* (*Sorocelis*) *nigrifasciata*, Gr., and *guttata*, Gerstf., *P. angarensis*, Gerstf., *torva*, var. *albi-*

frons, *P. fulvifrons*, Gr., and *P.* (*Dicotylus*, subg. n.) *pulvinar*, Gr., are described and figured (a preliminary account of these and of the fauna of the Baikal Lake generally is given by the same author in SB. schles. Ges. 1871, p. 53–57).

Leptoplana tuba, sp. n., Grube, *l. c.* p. 56 (Viti Islands). Lists of the species observed at St. Malo, Roscoff, and St. Vaast la Hougue: *id.* Abh. schles. Ges. 1869–72, p. 143, and 1868–69, p. 128.

Fedchenko (2) has described and investigated anatomically two freshwater Nemerteans (*Tetrastemma turanicum* and *Prorhynchus rivularis*) from Taschkend.

A. Agassiz has announced (Am. Natur. vi. p. 636) the startling discovery that *Tornaria* is not, as supposed, the larva of a starfish, but of *Balanoglossus*.

V. TREMATODA.

1. Bütschli, O. Beobachtungen über mehrere Parasiten. 1. Der Verbindungskanal der Hoden und der weiblichen Organe bei *Distomum endolobum*, Duj. Arch. f. Nat. xxxviii. pp. 234–236, pl. 8.
2. Linstow, O. von. Ueber Selbstbefruchtung bei Trematoden. Ibid. pp. 1–5, pl. 1.
3. Semper, C. Zoologische Aphorismen. II. Ueber die Gattung *Temnocephala*, Blanchard. Z. wiss. Zool. xxii. pp. 307–310, pl. 23.
4. Willemoës-Suhm, R. von. Zur Naturgeschichte des *Polystomum integerrimum* und des *P. ocellatum*, Rud. Ibid. pp. 29–39, pl. 3.
5. Zeller, E. Untersuchungen über die Entwickelung und den Bau des *Polystomum integerrimum*, Rud. Ibid. pp. 1–28, pls. 1 & 2.
6. ——. Untersuchungen über die Entwickelung des *Diplozoon paradoxum*. Ibid. pp. 168–180, pl. 12.

New species and other specialities :—

Distomum agamos, sp. n., Linstow (2), pl. 1. fig. 6, encysted in *Gammarus pulex*.

Polystomum ocellatum, the little-known parasite from the pharynx of *Emys europæa*, is figured and redescribed from manuscript notes of Von Siebold by Willemoës Suhm (4).

Temnocephala chilensis, Gay, has been rediscovered in Luzon and Mindanao on different species of freshwater crabs by Semper, who (3) gives an account of its anatomy, correcting and supplementing Philippi's. There is no metamorphosis, the embryo in the egg (which is attached to the shell of the crab) agreeing in shape with the adult.

On Distomes giving origin to pearls in *Bivalvia*: R. Garner, J. L. S. xi. p. 426.

Biology, Evolution.

Zeller's paper on *Diplozoon* (6) throws light on the much-doubted "zygosis" of the young *Diporpæ* (ciliated and provided with two eyes in their first stage) and their subsequent crosswise coalescence into a "double individual." Each of the two *Diporpæ* will seize with its ventral disk the dorsal wart of the other, twisting their bodies in such a manner that in the anterior part the dorsal, in the posterior the ventral surfaces are turned against each other. Sometimes the copulating individuals are of very different ages and sizes; and it may happen that one of them dies before the complete fusion has taken place, without allowing, however, the survivor to extricate itself. After copulation the suckers by means of which this process is effected disappear; and while the *Diplozoon* increases in size, the second, third, and fourth pairs of claspers (if not exceptionally developed before) are formed; at the same time with the last pair the first foundation of the generative organs is laid. In the adult *Diplozoon* the female organs are nevertheless almost invisible during winter; but they develop rapidly if the *Phoxini* (on the gills of which the observed species occurs) are placed in a heated chamber. The eggs are enclosed in corneous operculated egg-cases, each produced into a long tortuous filament.

The observations of Willemoës Suhm (4) are in all points confirmed by Zeller (5), whose paper on *Polystomum*, however, is much richer in information. The eggs have also here operculated egg-cases (without filament), and are deposited directly in the water in great numbers. The larva is provided with cilia, four eyes, and a circle of sixteen hooklets on the posterior part of the body; after the immigration and the loss of the cilia, during the growth of the young fluke, the acetabula are developed, pair after pair, the two great hooks increase, &c. In the adult the eyes and hooklets retain their original size, and are therefore easily overlooked; this is also the case in *P. ocellatum*, W. S. (4). Quite young worms are found in great number in young frogs of the first year; in frogs two, three, or four years old their size increases in a corresponding degree, but their number declines. The invasion evidently takes place only once in the tadpoles, whose branchial cavity was found, in the experimental case recorded, highly infested with them, while they did not penetrate into any other part of the body. In what manner they afterwards migrate into the bladder is still unknown. Old worms, in old frogs, only deposit their eggs (no trace of embryo) in spring, during the frog's visits to the water; young worms (2·5 mm., three years old) still contain eggs (with mature embryos!) in May and June.

Anatomy and Physiology.

Bütschli (1) confirms Stieda's [and Blumberg's; *cf.* Zool. Rec. viii. p. 454] important discovery that the supposed connecting channel between the male and female organs does not exist in *Amphistomum conicum*, but that "Laurer's channel" opens freely on the back of the worm, and is, in fact, the vagina, in *Distomum endolobum*; it opens on the back in the median line, at a place somewhat corresponding to the position of the ventral genital orifice, and is connected with ducts from the ovary and uterus, but was found full of moving spermatozoids. A self-fecundation will also probably be found to be impossible in other Trematodes. Zeller (5) arrived at similar results. On the

other hand, Linstow (2) found that, in a small fluke encysted in freshwater *Gammari*, self-fecundation probably takes place in this encysted state. Some specimens are found without any trace of sexual organs; in others the sperm-sac is full of moving spermatozoids, and the female organs are in course of formation; in others, again, both kinds of sexual organs are fully developed, and mature eggs with perfect egg-shells and beginning embryonic evolution are present. The fecundation must take place during the revolving of the animal in the cyst. (The organ of copulation in this species is not placed in the vicinity of the vulva, but behind the ventral disk.) This fluke migrates into its (unknown) second host (where it, perhaps, only dwells for a short period, during which the ova are expelled) in a state of sexual maturity. Leuckart made a similar observation on an encysted Distome in larvæ of *Ephemera*.

The following helminthological contributions of a mixed character, published some years ago, but hitherto unnoticed, may here be recorded:—

Olsson, P. Entozoa, iakttagna hos Skandinaviska hafsfiskar. I. Platyelminthes. Act. Lund. iii. & iv., 1867, pp. 113, c. tab. 5.

The author has dissected 860 specimens of 76 species of fishes from the Scandinavian coasts, and describes 23 species of perfect Cestoids (18 Scoleces) and 33 of Trematodes (many of them figured), after a general account of the structure and natural history of the Platyelminths. As the work must necessarily be consulted by zoologists studying the marine Helminth fauna of any North-Atlantic district, it may be sufficient to notice the new species:—*Bothriocephalus angusticeps* (*Sebastes norvegicus*), *Distoma bergense* (*Muræna anguilla*), *D. botryophoron* (*Cyclopterus, Molva*, &c.), *D. commune* (*Labrus*, sp. plur., and other fishes), *D. fellis* (*Anarrichas lupus*), *D. furcigerum* (*Pleuronectes limanda*, &c.), *D. increscens* (*Scomber, Merluccius*, &c.), *D. rubellum* (*Labrus maculatus*), *D. viviparum* (*Pleur. microcephalus*), *Echeneibothrium affine* (various species of *Raja*), *Phyllobothrium acanthiæ-vulgaris*, *Tetrabothrium maculatum* (*Lamna cornubica*), *T. norvegicum* (*Spinax niger*).

Hannover, A. Iagttagelser over indkapslede Indvoldsorme hos Fröen. Dan. Selsk. Skr. vii. 1864, pp. 15, pl. 2.

Cysts of five different kinds, containing *Entozoa*, are commonly found in frogs; three with Nematodes, two with Trematodes, are described and figured, and all questions connected with their occurrence carefully discussed.

Peñafiel, A., & Herrera, A. Apuntes para la Helmintologia Mexicana. Nat. Mex., Ent. 2ª & 8ª, 1869–70, pp. 53–56 and 173–176.

On the occurrence of *Distoma hepaticum*, *Strongylus filaria*, and *S. micrurus* in the domesticated animals of Mexico, and the damages which they produce.

A list of the collection of *Entozoa* collected by Dr. Hering and presented by him to the Stuttgard Museum is published, JH. Ver. Würt. xxviii. pp. 129–262.

A very useful synopsis of the *Entozoa* of the domestic animals (horse, ox, sheep, pig, dog, cat, geese, ducks, and chickens), "Husdyrenes Indvoldsorme," by Krabbe, Tidsskr. f. Veterin. (2) ii. 1872, is noticed by Cobbold, 'The Veterinairan,' xlvi. p. 341.

VI. CESTOIDA.

1. Grimm, O. Zur Kenntniss einiger weniger bekannten Binnenwürmer. Nachr. Ges. Götting. 1872, p. 240.

2. Linstow, O. von. Sechs neue Tænien. Arch. f. Nat. xxxviii. pp. 35–58, pl. 3.

3. ——. Ueber den Cysticercus *Tæniæ gracilis*, eine freie Cestoden-Amme des Barsches. Arch. mikr. Anat. viii. pp. 535–537, pl. 21. figs. 1–3.

4. Mégnin, J. T. Note sur le développement des Cestoïdes inermes chez les grands herbivores domestiques. J. de l'Anat. Phys. viii. pp. 289–296; C. R. lxxiv. p. 1292.

5. ——. Note sur le développement d'un petit *Tænia* inerme dans l'intestin d'un cheval, et sur les désordres graves qu'il y a causés. Bull. Soc. Centr. Médecine Vétérinaire (3), vi. pp. 110–115, pl.

6. Olsson, P. Om *Sarcotaces* och *Acrobothrium*, två nya parasit-slægten från fiskar. Œfv. Ak. Förh. 1872, no. 9, pp. 40–44, pl. ii.

7. Sangalli, G. Dell' Echinococco del fegato. Mem. Ist. Lomb. xi. pp. 12.

8. Sommer, F., & Landois, L. Ueber den Bau der geschlechtsreifen Glieder von *Bothriocephalus latus*, Brems. Z. wiss. Zool. xxii. pp. 40–99, pls. 4–8.

Two dissertations, by A. Günter (Breslau), "Ueber die Echinococcuskrankheit der Athmungsorgane," and G. Marcks (Halle), "Ueber Echinococcus im Gehirn," have not been seen by the Recorder, but have probably a pathological rather than a zoological bearing.

Evolution and Biology.

Linstow (3) found *Tænia gracilis*, Zed., in *Mergus merganser*, and its cysticerc in the perch.

Bothriocephalus (*Dibothrium*) *cordiceps*, Leidy (Zool. Rec. viii. p. 453), in Hayden's 'Preliminary Report of the United States Geological Survey of Montana' (Washington: 1872), pt. iv. pp. 381 & 382, figs. 1 & 2, abounding in trout in the Yellowstone Lake, Wyoming, U. S. A. The smaller worms are contained in cysts adherent to the exterior of the intestines; but the larger individuals, up to 6 inches in length, are imbedded in the muscles of the fish. From 5 to 50 were found in each fish infested.

Zenker, SB. Soc. Erlang. iv. pp. 71 & 87, introduced a single, but perfectly developed, segment of *Tænia mediocanellata* into the alimentary tube of a young goat; five weeks afterwards, two young cysticercs were found in its dorsal muscles; seven weeks later, when the goat was killed, two more

were found in the same place, exhibiting very distinctly the specific characters. New experiments on the feeding of dogs with *Echinococci* of the ox, and their evolution into *Tænia echinococcus* are recorded, *l. c.* p. 88.

In the ileum of a young horse which died through rupture of the intestine, apparently due to the presence of cysts of considerable size communicating with the intestine, MEGNIN (5) found a considerable number (some in the cysts, the greater number fixed to the mucous membrane of the intestine) of immature unarmed *Tæniæ* of an unnamed species (?) allied to *T. perfoliata*, *T. plicata*, &c., but found previously in its perfectly developed sexual state in a mule by Baillet. He is of opinion that the eggs are carried out with the fæces and swallowed with grass by the horse, that the proscolex (which is armed in *T. perfoliata*) makes its way into the muscular layer of the intestine, where it is transformed into a polycephalous Hydatid, the increasing size of which produces the cysts; through the communication between these and the intestine the young scoleces successively emigrate into the intestine, where they attain sexual maturity. The whole life-cycle of this tapeworm would then be performed in a single host without transmigration. (The tapeworm figured is apparently identical with *T. perfoliata* of the horse.)

Anatomy.

SOMMER and LANDOIS's treatise (8) is a profound and excellently illustrated investigation of the anatomy of the "broad tapeworm," with a review of the literature on the subject.

New forms:—

ACROBOTHRIDEA. Nova familia Cestoideorum bothrio sive acetabulo terminali, corpore articulato distinguenda. *Acrobothrium*, g. n. Caput inerme, bothrio terminali circulari, a corpore collo discretum. Aperturæ genitales laterales, masculæ femineis postpositæ. *A. typicum*, Olsson (6), tab. xi. figs. 5–8, in *Lotæ vulgaris* ventriculo et appendicibus pyloricis.

LINSTOW (2) describes shortly and figures a series of new *Tæniæ* from birds—*T. pachycephala* (*Anas histrionica*), *T. puncta* (*Corvus corone* and *nebula*), *T. pigmentata* (*Anas marila*), *T. cuneata* (*Gallus domesticus*), *T. parviceps* (*Mergus serrator*), *T. naja* (*Sitta europæa*); also an immature form (*T. hepatica*) encysted in the liver of the rat (*Mus decumanus*).

GRIMM (1) describes *T. sagitta*, sp. n., from *Cobitis barbatula*, and *T. ambigua*, Duj., from *Gasterosteus aculeatus*.

VII. NEMATODA.

1. BAKODY, T. Ueber das combinirte Vorkommen der *Trichina spiralis* im Verdauungskanal der Hühner. Z. wiss. Zool. xxii. pp. 422–427, pl. 34.

2. BÜTSCHLI, O. Beobachtungen über mehrere Parasiten. 2. Ueber das Männchen des *Trichosomum crassicauda*, B. 3. Einige Beobachtungen über den *Dispharagus denudatus*, Duj., des *Leuciscus erythrophthalmus*. Arch. f. Nat. xxxviii. pp. 236–246, pl. 8.

3. Claus, C. Beobachtungen über die Organisation und Fortpflanzung von *Leptodera appendiculata*. Schr. Ges. Marb. Suppl. Heft iii. (1869), pp. 24, 3 pls.

4. Ehlers, E. Ueber die Entwickelung des *Syngamus trachealis*. SB. Soc. Erlang. iv. p. 43; Ann. N. H. (4) ix. pp. 236–240.

5. Greeff, R. Ueber die frei in Wasser und in der Erde lebenden Nematoden, namentlich die Meeresbewohner. SB. Ver. Rheinl. xxvii. p. 87.

6. Grimm, O. Ueber das Vorkommen der *Ascaris dentata*, Rud., in der Leber von *Cobitis barbatula*. Nachr. Ges. Götting. 1872, pp. 248–250.

7. Linstow, O. von. Ueber *Ascaris cristata*, n. sp. Arch. f. Nat. xxxviii. p. 148, pl. 6.

8. Stirling, A. B. Note on the presence of *Trichina spiralis* in the muscles of the Rat. J. Anat. Phys. vi. 2, pp. 425–427.

9. Vernet, H. Quelques mots sur la reproduction de deux espèces hermaphrodites du genre *Rhabditis*. Arch. Sci. Nat. xlv. pp. 60–75, pl. 1.

10. Villot, A. Sur la forme embryonnaire des Dragonneaux (*Gordius*). C. R. lxxv. pp. 363–365, and 1539–1542; Ann. N. H. (4) x. pp. 231 & 232.

The *Trichina* previously discovered by Bakody encysted in the walls of the stomach and intestine of rats (and differing specifically from *T. spiralis*, Owen, found at the same time encysted in the muscles of the same rats), Bakody (1) has again found in the same places in rats and hens, without the contemporaneous occurrence of the *Trichina* of the muscular tissue. The cysts and parasite are figured and described in detail.

Gnathostoma (*Chiracanthus*) *hispidum*, sp. n., Fedchenko, *l. c.* [p. 427], pp. 7–11, fig. 15, in ventricular coats of wild hog, Tchardara (Central Asia), and of the domestic hog, Hungary.

Anguillula radicicola, sp. n., Greeff (5), from root-galls in various plants.

Filaria anhingæ: *cf.* Am. Nat. vi. p. 560.

Ascaris cristata, sp. n., Linstow (7). Very common in the intestine of the pike; in a younger state in cysts externally on the intestine of the bream.

Ascaris dentata was found encysted, more or less abundantly, in the liver of every examined specimen of *Cobitis barbatula*; in its sexual state it is found, much more rarely, in *Acerina cernua*: Grimm (6).

A. mystax. A fourth instance of the occurrence in man of this parasite of the dog and cat is recorded by Heller (SB. Soc. Erlangen, iv. p. 71), who inclines to the belief that *A. lumbricoides* is introduced directly into the human body. In one subject 18 young specimens were found, from 2·75 mm. to 13 mm. long.

Rhabditis terricola, Duj., and *R. leuckarti*, sp. n., Vernet (9), pp. 66 & 72,

pl. 1, both hermaphrodites (the evolution of the male element ordinarily precedes that of the female); the first ordinarily viviparous, the last oviparous.

Two free-living Nematoids are recorded by Grube as occurring in the littoral zone at St. Vaast la Hougue. Abh. schles. Ges. 1868–1869, p. 128.

Gordius robustus, Hammond, from Fish Creek, Montana, redescribed. Leidy, in Hayden's Geol. Surv. Montana, p. 382.

Evolution: biological problems.

Pairs of *Syngamus trachealis* in copulâ infest the trachea of birds, causing a peculiar cough, during which slimy masses, containing the eggs, are vomited, but often instantly devoured by the bird, in the fæces of which the eggs are found in a more or less advanced state of cleavage. In water or damp earth these develop into embryos, of which only a small portion escape from the shells. Feeding birds with eggs containing live embryos resulted, after two or three weeks, in the birds showing evident symptoms of being infested; and on dissection, the *Syngamus* was found in the trachea. Administering to the bird a *Syngamus* with mature ova did not result in infecting it with the parasite; and the same negative result was obtained on feeding it with insects which had been induced to swallow the eggs. It is still a matter of doubt whether the *Syngamus* is introduced into the trachea directly or through the digestive canal. Ehlers (4).

Trichosomum. Leuckart's discovery, that the males (2·5 mm.) of *T. crassicauda* migrate into the uterus of the females (17 mm.), and live there as parasites, from 2 to 5 in each, is confirmed by Bütschli (2). If a female contains no males the eggs are not fertilized, but pass through the first stage of evolution, and afterwards undergo a fatty degeneration. (Organs of copulation are wanting in the female.)

Leptodera appendiculata lives in *Arion ater* as larva (mouth and vent closed; tail with two long cuticular bands). If the snail is laid in water or stimulated forcibly to muscular contractions, these small nematoids are expelled in great numbers, and rapidly develop in the water or any slimy substance, the bands are lost, mouth, genital orifice, and vent become opened through the casting off of the entire cuticle, generative elements are developed, and copulation takes place. The rapidly developing embryos do not attain the size of the parasitic generation, want the bands, and are in other respects unlike, but adopt the characters of the genus *Rhabditis*. They do not need any change of condition for attaining sexual maturity: they copulate, produce a third generation, &c. In this manner an indefinite series of generations may follow, until the nutritive substance is exhausted, when encystation takes place. The migration into the snail, and the presumed transformation into the *Leptodera*-form of these encysted *Rhabditis* worms, was not observed. Between male and female individuals of the *Leptodera*- and *Rhabditis*-generation no copulation will take place. There is some analogy (in spite of the great difference) between this extraordinary "alternation of generations" and that of *Ascaris nigrivenosa*. Claus (3).

Ascaris cristata. The larva in its first stage is provided with a piercing spine; it afterwards lives without this (but in all other respects agreeing with the first stage and with the youngest stages in the pike) encysted on the outer surface of the intestine of the bream: Linstow (7).

Gordius. Villot (10) has made remarkable observations on the embryonic and larval states of two species. The embryo is microscopical (0·2 mm. long), cylindrical, consisting of (1) a retractile head provided with a circle of spines, and a trunk armed with 3 styles, (2) a short annulated body and tail, separated by a deep constriction, the tail terminating in 4 small appendages. By the aid of the armature of the head it enters Dipterous larvæ, where it becomes encysted; it is then transferred into small freshwater Cyprinoids (*Phoxinus, Cobitis*), where it is set free, but is encysted for a second time, and may be found abundantly in autumn in the walls of the intestine; in these cysts, however, it enters upon its second or larval state, in which the body and tail are lengthened, and their limits effaced; but the armature is retained, which almost makes it a Nematoid with the trunk of an Echinorhynch. The author presumes that the occurrence of adult (sexless) *Gordius* in *Coleoptera* and *Orthoptera*, and their emigration from these, so often observed [*e. g.*, according to Grube, JB. schles. Ges. 1869, p. 71, abundantly in larvæ of *Melolontha*], are only accidental or abnormal phenomena. [This view can hardly be accepted. The difficulty is to account for the interval between the encysted larva in freshwater fishes and the full-grown *Gordius* in the abdominal cavity of terrestrial insects.]

Nematoids in plants. Greeff found (SB. Ges. Marb. 1872, p. 169) certain tubercles on the root-fibres of *Dodaxia orientalis* full of *Anguillulæ* in all stages, from the egg to the mature and pregnant state (these had previously been found in similar galls on the root-fibres of *Sedum* and grasses). On *Anguillulæ* in the leaves of *Falcaria rivinii*, cf. Frauenfeld, Verh. z.-b. Wien, xxii. p. 396.

VIII. ACANTHOCEPHALA.

Linstow, "Zur Anatomie und Entwickelungsgeschichte des *Echinorhynchus angustatus*, Rud." (Arch. f. Nat. xxxviii. p. 6, pl. 1), states that the eggs are rapidly developed in *Asellus aquaticus*, where they attain a size almost equalling that of the (usually mature) specimens in the perch. The "*lemnisci*" are regarded as answering functionally to the intestine, and the ovaria and testes as distinct from the "*ligamenta suspensoria*." Nerve-ganglia are present; and the generative organs in both sexes are fully described. The affinities of the order are thus summed up:—While the testes suggest a comparison with the *Trematoda*, we are reminded of the *Cestoda* by the want of mouth and vent, the hooked trunk, and the removal of segments with mature ova (*E. tuba*), and of the *Nematoda* by the lateral vessels and the evolution without metamorphosis.

Coleops (g. n.) *anguillæ*: Lockwood, Am. Nat. vi. pp. 449–454, woodcut.

IX. GEPHYREA (SIPUNCULIDA).

Lists of the *Sipunculacea* observed at St. Vaast la Hougue, Roscoff, and St. Malo, are contributed by Grube, Abh. schles. Ges. 1868–1869, p. 128, and 1869–1872, p. 192. (*Phascolosoma obscurum*, Qf., = *margaritaceum*, Sars.)

Saenger has published (in Russian) a minute anatomical investigation of *Halicryptus spinulosus* and *Priapulus multidentatus* (Moskou: 1870), which the Recorder is unable to abstract.

ECHINODERMATA

BY

C. F. Lütken, Ph.D., F.R.D.A.

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1. Agassiz, A. Preliminary notice of a few *Echini*. Bull. Mus. C. Z. iii. 4.

2. ——. Revision of the *Echini*. Pts. 1 & 2. Illustr. Catal. M. C. Z. vii., pp. 378, 49 pls. Cambridge (U. S. A.): 1872.

3. Baudelot, E. Études générales sur le système nerveux. Contribution à l'histoire du système nerveux des Échinodermes. Arch. Z. expér. i. pp. 177–216.

4. Cotteau, G. Description de quelques Échinides tertiaires des environs de Bordeaux. Act. Soc. L. Bord. xxvii. pp. 248–260, pls. 12 & 13.

Six species of *Cœlopleurus*, *Nucleolites*, *Brissus*, *Periaster*, and *Euspatangus* are described and figured.

5. ——. Échinides nouveaux ou peu connus. R. Z. 1871–1872, pp. 434–449, pls. 29 & 30.

The eleventh of this author's articles on fossil sea-urchins, comprising (Nos. 84–89) descriptions of seven species of *Pseudocidaris*, *Echinoconus*, *Toxopneustes*, *Cassidulus*, and *Tetracidaris*.

6. Decken, C. C. von der. Reisen in Ost-Afrika. Bd. iii. pp. 117–134, 2 pls. Seesterne und Seeigel; bearbeitet von Ed. v. Martens. Die Holothurien Ost-Afrikas; bearbeitet von C. Semper.

7. Desor, E. L'évolution des Échinides dans la série géologique et leur rôle dans la formation jurassique. Neuchâtel: 1872, pp. 28, pl. 1.

8. —— & Loriol, P. de. Échinologie helvétique. Formations jurassiques. Wiesbaden & Paris: 1868–1872, 61 pls.

9. Fischer, P. Échinodermes des côtes de la Gironde et du sud-ouest de la France. Act. Soc. L. Bord. xxvii. pp. 358–376.

10. Gray, J. E. List of Echinoderms collected by Rob. M'Andrew in the Gulf of Suez in the Red Sea. Ann. N. H. (4) x. pp. 115–124.

11. Greeff, R. Ueber den Bau der Echinodermen. SB. Ges. Marb. 1872, pp. 93–101, 155–169.

12. Kowalewsky, A. Beiträge zur Entwickelungsgeschichte der Holothurien. Mém. Pétersb. x. 6, 1867, pp. 8, pl. 1.

13. Ljungman, A. Förteckning öfver uti Vestindien af Dr. A. Goës samt under korvetten Josefinas expedition i atlantiska oceanen samlade Ophiurider. Œfv. Ak. Förh. 1871, vi. pp. 615–657.

14. Lovén, S. Om Echinoideernas byggnad. *Ibid.* 1871, viii. pp. 1–47, pl. 19; Ann. N. H. (4) x. pp. 285–298, 376–385, 427–444; Arch. f. Nat. xxxix. pp. 16–70, pl. 4; C. R.

15. Lütken, C. F. Ophiuridarum novarum vel minus cognitarum descriptiones nonnullæ. Beskrivelser af nogle nye eller mindre bekjendte Slangestjerner. Med nogle Bemærkninger om Selvdelingen hos Straaldyrene. Overs. Dan. Selsk. 1872, pp. 75–158, pls. 1 & 2.

16. Lyman, T. Note sur les Ophiurides et Euryales qui se trouvent dans les collections du Muséum d'Histoire Naturelle de Paris. Ann. Sc. Nat. (5) xvi. No. 4 (pp. 8).

17. Moulins, C. des. Sur les épines des Echinocidarites. Act. Soc. L. Bord. xxvii. pp. 162–170, pls. 10, 11.

18. ——. Spécification et noms légitimes de six Échinolampes. *Ibid.* pp. 309–322, pls. 18–20.

E. laurillardi, *richardi*, and *rangii* (= *hallei*, Val.) are figured.

19. Sars, G. O. Nye Echinodermer fra den norske Kyst. Forh. Selsk. Chr. 1871, pp. 1–31.

20. Tournouer, R. Recensement des Échinodermes de l'étage du calcaire à Astéries dans le sud-ouest de la France. Act. Soc. L. Bord. xxvii. pp. 263–308, pls. 15–17.

The species figured belong to the genera *Cœlopleurus*, *Echinocyamus*, *Runa*, *Echinarachnius* (?), *Hemiaster*, *Echinolampas*, *Schizaster*, and *Periaster*.

21. Thomson, W. On the Crinoids of the 'Porcupine' deep-sea dredging-expedition. Proc. R. S. Edinb. 1871–1872, pp. 764–773.

22. ——. Notice of a new family of the *Echinodermata*. Ibid. pp. 615–617.

23. ——. On the *Echinoidea* of the 'Porcupine' deep-sea dredging-expeditions. Proc. R. S. 1872, pp. 491–497; Ann. N. H. (4) x. pp. 300–306.

24. Troschel, F. H. Die Familie der Echinocidariden. Arch. f. Nat. xxxviii. pp. 293–356.

Anatomy.

Greeff (11; see also Zool. Rec. viii. p. 462) has given some short contributions to the more delicate anatomy of Echinoderms, especially of the Starfishes. He discusses:—the structure of the eyes (no lenses!), and the existence of a hitherto overlooked tentaculiform organ of sensation, connected with the eye, in Starfishes; their nervous and vascular systems (the cavity of the body, the anal and oral vascular rings, and the veins in the interior [!] of the nerve-stems) and organs of respiration (dermal tentacula and a peculiar hitherto overlooked gill-like [?] organ connected with the stone-channel and the anal ring); the dermal vascular system and the connexion between the different vascular and nervous rings; the so-termed "intestinal veins" of Tiedemann, which are shown not to exist; the madreporic plate, as conducting sea-water not only into the aquiferous system, but also into the true blood-vessels and into the cavity of the body; the multiplicity of the "heart" and stone-channel accompanying that of the madreporic plate; the vessels that spring from the anal ring and enclose the organs of generation; the communication established through the generative orifices between the vascular system and the sea-water; the peculiar (gill-like?) structure of the anal ring; the nerve-trunks in Holothurians and the homology of their enclosing cavities with the ambulacral furrows of Starfishes.

Baudelot (3) discusses previous investigations on the nervous system of Echinoderms, demonstrating the nervous system in Ophiuroids and Echinoids treated with diluted acid, and entirely confirming the observations of Krohn on the latter. He describes the fibrillated and celluligerous structure of the nervous trunks, pointing out that the same structure is observed in the central fibrous cords of the arms of *Antedon*, which evidently do not belong to the nervous system. This he failed altogether to discover in the true Starfishes.

Lovén (14) has discovered an organ of sense (? of taste), the "*sphæridia*," in the *Echinidæ*, where they are placed, in different numbers, on the adoral parts of the ambulacra, in some in peculiar cavities of the test, in others on its surface; their numbers and position in the different genera is given (*Cidaris* is the only genus in which they are not found); they are small, movable, globular or oblong, stalked, calcareous, vitreous bodies, with a ciliated cuticle. Length 0·11–0·375 millim.

Spontaneous Division in Echinoderms.

Lütken (15) records Starfishes and Ophiurans in which phenomena, apparently only to be explained by spontaneous division, have been observed, viz. several species of *Ophiothela* and *Ophiactis*, in which the normal number of arms is 6, and which are often found in halves, with 3 (rarely 4 or 2) arms, or with the representatives of the wanting arms in a more or less advanced state of reconstruction; and also *Ophiocoma pumila* (and allied species), in which, however, the fissiparity is restricted to the young, mature specimens being always regularly 5-armed. The same phenomena occur in *Asterias problema* and *tenuispina* (probably also in some closely allied species with more

than the 5 ordinary arms), while in some species of *Linckia* and *Ophidiaster* a radiary division takes place, every single arm regenerating the whole set of arms from its proximal end. (In *Asterias helianthus* the number of arms is constantly increasing through the intercalation of new arms.) The circumstances attending these curious facts are given in detail, and comparisons instituted with the phenomena of regeneration and division in other *Radiata*. The connexion between spontaneous division, regeneration, and gemmation is critically discussed; it is pointed out that the so-termed "spontaneous division" is in many instances (*Strobila*, *Infusoria*, and probably also the fissiparous *Annulata*) not a division, but a more or less masked gemmation; so that the existence of a true self-division beyond the limits of the unicellular organisms (*Monera* &c.) might be doubted, were it not that the fissiparous Starfishes and Brittlestars showed in an unequivocal manner the qualitative difference between this monogenetic process and true gemmation. (Kowalewsky, Z. wiss. Zool. xxii. p. 283, confirms Lütken's observations, from the examination of living specimens. The division of *Asterias tenuispina* is easily observed when specimens with all the arms of full length are put in a tank with sea-water; on the second day, if not earlier, they will begin to divide, the 6-armed ordinarily into two with 3 arms, the 7-armed into one with 3 and one with 4 arms, the latter often again subdividing into two with 2 arms. (Greeff's observations [11, p. 104] intimate that external circumstances may influence the process.) This division was also observed in a small "*Ophiolepis*" [probably *Ophiactis virens*] in the Bay of Naples. In *Linckia ehrenbergi* (in the Red Sea) the arms will separate from the body quite regularly, one after the other, and the severed arms will reproduce 4 arms from the proximal end [*cf.* woodcuts, p. 123, in Lütken's paper]. Not a single specimen could be found with all the arms regularly developed.) Lütken sums up the result of the whole discussion on spontaneous division in *Echinodermata* and *Anthozoa* thus:—1. Divisibility is the highest expression of the regenerative power in animals; 2. In certain *Radiata* endowed with a very high regenerative faculty, spontaneous division occurs alone (*Asteridæ*, *Ophiuridæ*) or combined with gemmation (*Actiniæ*); 3. The true self-division or schizogenesis in *Actiniæ*, *Medusæ*, *Asteridæ*, and *Ophiuridæ* (not to be confounded with the masked blastogenesis in *Infusoria*, *Scyphistoma*, and certain chætopodous *Annulata*) ought to be regarded as a distinct type of asexual reproduction (monogenesis), on the same line as blastogenesis, sporogenesis, and parthenogenesis.

Geographical Distribution.

Grube enumerates the Echinoderms observed at Roscoff and St. Malo (Abh. schles. Ges. 1868–69, p. 128; 1869–72, p. 143; *Echinus miliaris* is erroneously treated as a *Sphærechinus*). Fischer (9) enumerates 26 species from the west coast of France; 22 of these are Mediterranean, and 6 of them find their northern and 4 their southern limit somewhere in this region. Some biological facts are recorded, as is also the case with Lafont's list of species observed at Arcachon (Act. Soc. L. Bord. xxviii. p. 278: *Asterias rubens* = *violacea*, ♂). Compare also the preliminary notes of Fischer and Folin on results obtained by dredging off Cape Breton: C. R. lxxiv. pp. 750–753. Metzger adds *Astropecten muelleri* to his previous list of the Echinoderms of the shore of Ostfriesland (Die wirbellosen Thiere der ostfriesischen

Küste, ii.: Hannover, 1871, pp. 14 & 15). Verrill contributes a list of 13 species of Echinoderms from North Carolina: Am. Journ. Sc. iii. p. 437. His remarks "on the distribution of marine animals on the coast of New England" are reprinted in Ann. N. H. (4) ix. pp. 92–97. *Cf.* also Whiteaves "on deep-sea dredging in the Gulf of St. Lawrence," *ibid.* x. p. 346. A tabular view of the distribution of the Atlantic *Ophiuridæ* is compiled by Ljungman (13). Gray (10) enumerates the species known from the Red Sea. Martens (6) has put together a list of the Starfishes, Brittlestars, Sea-lilies, and Sea-urchins of the East-African shores from the Red Sea to Natal, showing their distribution, as far as known, along the coasts; and Semper (6) a comparative list of the Holothurians of the Red Sea, and of those of Mozambique &c. Jarzynsky has published (1870: in a Russian paper) a valuable list of the Echinoderms found in the White Sea and on the "Murmanian" shore. Greeff gives a general sketch of the Echinoderm-fauna of the Canaries ("Madeira und die canarischen Inseln in naturwissenschaftlicher besonders zoologischer Beziehung," 1872: Marburg, pp. 30 & 31). Ulianin notices only 2 Echinoderms (*Amphiura* and *Synapta*) from the Black Sea (*ante*, p. 422).

Wyville Thomson (23) sums up the experience on the geographical and bathymetrical distribution of the deep-sea Echinoderms obtained from 1868–70, in a belt of sea-bed embracing 1500 miles in length and 100–150 in width, and extending from Færö to Gibraltar. In this area 57 successful hauls of the dredge were made in depths exceeding 500 fathoms, 16 beyond 1000 fathoms, and 2 beyond 2000 fathoms. Even at the latter extreme depth Echinoderms appeared to be abundant, viz. *Echinus norvegicus, Brissopsis lyrifera, Archaster* sp., *Ophiocten sericeum, Ophiacantha spinulosa, Echinocucumis typica*, and *Bathycrinus gracilis*. From 2000 fathoms upwards the number increased rapidly, possibly owing to the wider knowledge of the fauna of the shallower water; from 300–800 fathoms, along the coast of Britain, many species are enormously abundant, so much so as to give a very marked character to the fauna of that zone. Several of these species have long been known to inhabit the deep waters of the British and Scandinavian area; others (*e. g. Schizaster fragilis* [introduced here as a "*Tripylus*," an error long corrected by the Recorder], *Ctenodiscus crispatus, Pteraster militaris, Amphiura abyssicola, Antedon eschrichtii*) are well known members of the Scandinavian or Greenland fauna, but were not hitherto recorded as British; and to these a series of quite new Echinideans, Asterideans, and Ophiurideans must be added. A fourth group, likewise new (*Porocidaris, Phormosoma, Calveria, Pourtalesia, Neolampas, Zoroaster, Ophiomusium, Pentacrinus, Rhizocrinus*, and *Bathycrinus*), appears to be referable to *a special deep-sea fauna*, of which we as yet know only a few examples, which, however, nearly all show close relations to types of cretaceous or early tertiary age, hitherto supposed to be extinct. Of the 27 Echinoids, 6 are denizens of moderate depths in the celtic province; 8 belong to a fauna of intermediate depth; 5 are recognized members of the Lusitanian and Mediterranean fauna; while 7 have been brought to light for the first time through the deep-sea explorations.

Holothuriidæ.

Cucumaria villosa, Grube, JB. schles. Ges. 1870, p. 88, Adriatic; *C. glaberrima, crucifera*, Semper (6), p. 121, Aden: spp. nn.

Thyone (*Stolus*) *rosacea*, id. ibid. p. 122. (According to Semper, *Holothuria maxima*, Forsk., = *scabra*, Jäg.; *Urodemas ehrenbergi* and *gracilis*, Selenka, belong to *Phyllophorus*, Grube; *Urodemas*, *Orcula*, and *Hemicrepis* = *Phyllophorus*.)

Thyonella, g. n., Verrill, Am. Journ. iii. p. 437. Only 10 tentacles, of which the 2 inferior are smallest (in *Thyonidium* 20, 2 smaller alternating with 2 larger); the test is thicker, and filled with a large amount of calcareous plates. There are other differences in the oral plates, the genital organs &c. Type *Colochirus gemmatus*, Pourt.

Thyonidium scabrum, M. Sars, = young *Holothuria intestinalis*: Sars (19, p. 28). *Oligotrochus vitreus*, Sars (*l. c.* p. 29), Dröbak, Lofoden I., 50–300 fathoms [Skagerrak, Ann. N. H. (4) x. p. 470]; *Stichopus natans*, Sars (*l. c.* p. 30), Lofoden I., Manger, Hardangerfjord, 200–300 fathoms. The (hitherto unpublished) characters of *Oligotrochus* are given as follows:—

Corpus crassiusculum, seu haud multo elongatum, teres, subcylindricum aut subfusiforme, cute tenui, glaberrima, præter corpuscula perpauca minutissima calcarea rotiformia multiradiata singula (non acervatim accumulata) sparsa, non petiolata, sed cuti immersa, laminis calcareis destitutum. Discus oralis paulo inclinatus. Tentacula 12, in partem eorum basalem quasi in vaginam retractilia, non autem in corpus abscondenda, brevissima, elongato-conica, utrinque digitata. Musculi corporis longitudinales, 5 gracillimi, duo dorsales magis approximati quam ceteri fere æquidistantes. Intestinum ansam duplicem componens. Os anticum subventrale; anus posticus circularis haud lobatus. Vesica poliana unica; tubercula madreporiformia 1–3. Tubi genitales ramosi breves crassi fasciculos 2 componentes. Annulus calcareus pharyngeus bene evolutus, humilis, e laminis (ut videtur) 10 constans, intime connatis, fere æque latis, ventralibus altioribus, dorsalibus humilioribus, margine anteriore cuspidibus 12 triangularibus ornato.

Kowalewsky (12), in his observations on the evolution of some Mediterranean *Holothuriidæ*, points out that a metamorphosis is only known in *Synaptæ*, and that the Holothurians with terminal mouth (*Dendrochirotæ* ?) are probably developed without any; but this may possibly be otherwise in Holothurians with ventral mouth (*Aspidochirotæ* ?), the eggs of which are smaller, pellucid, and without fat-globules. The author has witnessed the emission of eggs and spermatozoa in "*Psolinus brevis*" (according to the author, this species, hitherto very little known, and almost regarded as dubious, or as the young state of some *Cucumaria*, is abundant at Naples) and *Pentacta doliolum*; the eggs are fecundated before emission. The embryo of the latter leaves the egg early, with 5 ciliated bands, 3 tentacles just beginning to appear, &c.; that of the *Psolinus* wants the ciliated stage, and is only set free at a later stage, provided with 5 rather developed feelers and 2 terminal feet, water-system and digestive tube well developed, &c.; those of *Phyllophorus* are developed in the body-cavity.

Echinidæ.

A. Agassiz, in his "Revision of the *Echini*," reduces the recent Sea-urchins to 207 species, distributed into 81 genera. The following is a synopsis of the recognized genera, and their distribution into tribes and families, with the most important synonyms:—

DESMOSTICHA, Häck.

Cidaridæ, Müll.

Goniocidaridæ: *Cidaris* (= *Gymnocidaris*), *Dorocidaris*, *Phyllacanthus* (= *Chondrocidaris*), *Stephanocidaris*, *Porocidaris*, *Goniocidaris* (= *Temnocidaris*).

Saleniidæ: *Salenia* (= *Salenocidaris*).

Arbaciidæ: *Arbacia* (= *Echinocidaris*), *Podocidaris*, *Cœlopleurus* (= *Keraiophorus*).

Diadematidæ: *Diadema*, *Centrostephanus* (= *Echinodiadema* and *Trichodiadema*), *Echinothrix*, *Astropyga*, *Asthenosoma* (= *Calveria*).

Echinometridæ: *Colobocentrotus* (= *Podophora*), *Heterocentrotus* (= *Acrocladia*), *Echinometra* (= *Ellipsechinus*), *Parasalenia*, *Stomopneustes* (= *Heliocidaris*, an oligoporous genus!), *Strongylocentrotus* (*Toxopneustes*, *Anthocidaris*, *Loxechinus*, &c.), *Sphærechinus*, *Pseudoboletia*, *Echinostrephus*.

Echinidæ.

Temnopleuridæ: *Temnopleurus* (= *Toreumatica*), *Pleurechinus*, *Temnechinus* (= *Genocidaris*), *Microcyphus*, *Trigonocidaris*, *Salmacis*, *Mespilia*, *Amblypneustes*, *Holopneustes*.

Triplechinidæ: *Phymosoma* (= *Glyptocidaris*), *Hemipedina* (= *Cœnopedina*), *Echinus* (= *Psammechinus*), *Toxopneustes* (= *Boletia*, *Lytechinus*), *Hipponoe* (*Tripneustes*), *Evechinus*.

Clypeastridæ.

Euclypeastridæ.

Fibulariina: *Echinocyamus*, *Fibularia*.

Echinanthidæ: *Clypeaster* (*Stolonoclypus*), *Echinanthus*.

Laganidæ: *Laganum*, *Peronella*.

Scutellidæ: *Echinarachnius* (= *Dendraster*, *Scaphechinus*), *Arachnoides*, *Echinodiscus* (= *Lobophora*), *Mellita*, *Astriclypeus* (= *Crustulum*), *Rotula*, *Encope*.

PETALOSTICHA, Häck.

Cassidulidæ.

Echinoneidæ: *Echinoneus*.

Nucleolitidæ: *Neolampas*, *Echinolampas*, *Rhynchopygus* (= *Cassidulus*), *Echinobrissus*, *Nucleolites*, *Anochanus*.

Spatangidæ.

Ananchytidæ: *Pourtalesia*, *Homolampas* (g. n.), *Platybrissus*.

Euspatangina: *Spatangus*, *Maretia*, *Eupatagus*, *Lovenia*, *Breynia*, *Echinocardium* (= *Amphidetus*).

Leskiidæ: *Palæostoma* (= *Leskia*).

Brissina: *Hemiaster* (= *Abatus*), *Tripylus*, *Rhynobrissus* (g. n.), *Brissopsis* (= *Kleinia*), *Agassizia*, *Brissus*, *Metalia*, *Plagionotus*, *Meoma*, *Linthia* (= *Desoria*), *Faorina*, *Schizaster*, *Moira*.

Part I. also contains detailed bibliographical and synonymic lists, and a chapter on nomenclature and one on geographical distribution (*cf.* p. 446). Part II. gives the detailed generic and specific description of the *Echini* of the eastern coast of the United States, incorporating those of the deep sea collected by Pourtales, with 42 plates and several charts and tables showing their

bathymetrical and geographical distribution. Reference is made below to the genera and species described in this part. (The figures on the plates are not cited, owing to their frequent dispersion on several plates.)

Cidarinæ.

Cidaris hystrix, Lam., is united with *C. papillata* by W. Thomson (23), since every possible link can be shown between them: 100–400 fath., from Færö to Gibraltar, small specimens frequently down to 1000 fathoms. *C. affinis* "apparently distinct, though it is sometimes not easy to draw the line between them and small forms of *papillata*;" abundant in the Mediterranean, and locally off Portugal. The three species are united with each other and with *Dorocidaris abyssicola*, under the name of *D. papillata*, by A. Agassiz (Rev. pp. 254–258, tab.). *Cidaris tribuloides*, Lamk.: Agassiz, *l. c.* pp. 252–254, pl.

Porocidaris purpurata, sp. n., W. Thomson, *l. c.*, off the "Butt of the Lews," 500–600 fath. The genus, hitherto only known in a fossil state, is chiefly distinguished by the paddle-like spines surrounding the mouth, and a tendency to coalescence in the scrobicular areæ. The "row of small holes surrounding the tubercles of the primary spines in the scrobicular area," formerly considered a primary character, is wanting in the recent species.

Saleniinæ.

Salenia (*Salenocidaris*, olim) *varispina*, Agassiz, *l. c.* pp. 258–262, pl. 3.

Echinothuriinæ.

Named after the fossil *Echinothuria*, Woodw., from the chalk. Intermediate between the *Cidarinæ* and *Diadematinæ*. Test circular, flexible, much depressed; plates of the perisome long and strap-shaped; the interambulacral plates overlap each other regularly from the apical towards the oral pole, while the ambulacral plates overlap in a similar way in the opposite direction; the latter are essentially within the former, which overlie them along their outer edge. Ambulacral pores trigeminal, in wide arcs; the two pairs of pores of each nearest the centre of the ambulacral area pierce two small accessory plates, intercalated between the ambulacral plates, while the outer pair pass through the ambulacral plate itself near its outer extremity. Dorsal ambulacral feet conical, simple; ventral with terminal suckers, supported by calcareous rosettes, the walls of both supported by cribriform plates. Peristome large, edge entire, without branchial notches, the peristomal membrane uniformly plated with twenty rows of imbricating scales, corresponding with the rows of plates of the test, and the rows of ambulacral feet continued over them to the edge of the mouth. Periproct large; ovarian plates large, sometimes broken up into several pieces; ovarian pores large, partly filled up with membrane. Dental pyramid wide, strong, and low; the epiphyses of the tooth-sockets do not form closed arches; teeth simply grooved. Spines hollow, small, the larger (and also the pedicellaries) approaching in character to those of the *Diadematinæ*. Wyville Thomson (22).

Phormosoma, g. n., W. Thomson. Plates of the test only slightly overlapping, and fitting so closely as to form a complete calcareous casing, without any membranous fenestræ; dorsal and ventral surfaces differing singularly

in characters, the oral almost uniformly covered with large areolar depressions surrounding spine-tubercles. *P. placenta*, sp. n., *id. l. c.*, off the Butt of the Lews.

Calveria, g. n., *id. l. c.* Ambulacral and interambulacral plates form large expansions towards the middle line of the area, while their outer portions are narrow and strap-shaped, leaving large fenestræ filled up with membrane between them. Dorsal and ventral surfaces not differing markedly. *C. hystrix*, off the Butt of the Lews, and *fenestrata*, coast of Portugal, south and west of Ireland, deep water, *id. l. c.*, spp. nn.

[*Phormosoma* is not recognized, and the two species of *Calveria* are not distinguished, by Agassiz (Rev. pp. 272–273, pl. 2 *c*), who unites *Calveria* with *Asthenosoma*, Grube, and the *Echinothuriinæ* with the *Diadematinæ*; but Wyville Thomson is apparently right in separating them as distinct families.]

Diadematinæ.

Diadema setosum, Gr. (=*antillarum*, *savignii*, &c.), Agassiz, Rev. pp. 274–276, pl.

Arbaciinæ.

Troschel (24; and SB. Ver. Rheinl. 1872, p. 159) gives the following synopsis of the species of *Echinocidaris* (*Arbacia*), subdividing it into two genera :—

1. *Echinocidaris*. None of the ocular plates reach to the periproct: a single transverse series of tubercles on the plates of the interambulacral areæ.
   - *a*. A naked star round the periproct (*Agarites*, Ag.). *E. punctulata*, *stellata*, *dufresnii*, *loculata*, and *alternans*, sp. n.
   - *b*. No naked star round the periproct (*Echinocidaris*). *E. pustulosa*, *æquituberculata*, *grandinosa*, and *australis*, sp. n.
2. *Pygomma*, g. n., Trosch. Some of the ocular plates reach the periproct; beside the principal series of tubercles, mostly small secondary tubercles on the plates of the interambulacra.
   - *a*. A naked star round the periproct. *P. spatuligerum*.
   - *b*. *Tetrapygus*, Ag. No naked star round the periproct. *P. nigrum*.

In the *Echinocidaridæ* (regarded also by Troschel as a distinct family) a *sphæridium* is placed close to the peristome in a small excavation in each ambulacrum (*Temnotrema* = *Temnopleurus japonicus*, young [*cf.* Agassiz, Rev. p. 166]; *Parasalenia*=*Echinometra*, sp., young (?)). In the detailed paper (24) the historical part is treated very fully.

Arbacia punctulata, Lamk. (=*davisi*), Agassiz, *l. c.* pp. 263–266, pl.; *Cœlopleurus floridanus*, id. *l. c.* pp. 267–269, pl. 2 *c*; *Podocidaris sculpta*, id. *l. c.* pp. 269–271, pl. 4.

Echinometriinæ.

Strongylocentrotus dræbachiensis, Müll. (*Toxopneustes chlorocentrotus* and *granulatus*, &c.), Agassiz, *l. c.* 276–281, pl.; *S. armiger*, id. (1) Bull. (4), Australia. *Toxopneustes pallidus*, sp. n., Sars (19, pp. 25–27), Norway, 30–40 fath.; *T. pictus*,

Norm., Norway, *id.* Forh. Selsk. Chr. 72. [Agassiz regards both as varieties of *S. drøbachiensis.*]

Echinometra subangularis, Leske (*lucunter*, Lütk., *michelini*, Ag.), and *E. viridis*, Ag. (*plana*, Ag.): Agassiz, Rev. pp. 282–285, pl. 10*a*.

Sphærechinus australiæ, id. (1) Bull. 4, Australia.

Echininæ.

Echinus rarispinus, Sars, Forh. Selsk. Chr. 1872, p. 104, Storeggen, 80–100 fath., and *depressus*, id. (19, pp. 22–25), Bodö, 150–200 fath., spp. nn. W. Thomson regards *E. rarispinus*, *elegans*, and *norvegicus*, D. & K., as doubtfully distinct species, adding, nevertheless (with hesitation), as a new species *E. microstoma*, abundantly at 150–400 fath., off Scotland and Ireland. [*E. esculentus* is not a *Sphærechinus*, as this author and Metzger state.] Agassiz (Rev. pp. 296 & 297, pl. 6*a*) unites *E. rarispinus* and *depressus* with *norvegicus*, but keeps, provisionally, *E. elegans* apart—suspecting, however, the identity of all these species with *E. flemingi*. *E. gracilis*, Agassiz, *l. c.* pp. 293–296, pl.

Amblypneustes pentagonus, Ag., Mauritius, *inflatus* and *purpurascens*, Lütk. MS., Australia: *id.* (1) Bull. 4.

Temnechinus (*Genocidaris* olim) *maculatus*, Ag.: *id.* Rev. pp. 285–289, pl. 8.

Trigonocidaris albida, Ag., *id. l. c.* pp. 289 & 290, pl. 4.

Hemipedina (*Cænopedina* olim) *cubensis*, Ag.: *id. l. c.* p. 291, pl. 3.

Toxopneustes variegatus, Lmk. (*Lytechinus carolinus*): *id. l. c.* pp. 297–301, pl.

Hipponoe esculenta, Leske (*Tripneustes ventricosus*, *Heliechinus gouldi*): *id. l. c.* pp. 301–303, pl.

Clypeastrinæ.

Echinocyamus pusillus, Müll. [not young *Clypeaster*!]: Agassiz, *l. c.* pp. 304 & 305, pl.

Clypeaster subdepressus, Gr. (*prostratus*, Rav.): *id. l. c.* pp. 306–310, pl.

Echinanthus rosaceus, Lmk.: *id. l. c.* pp. 310–314, pl.

Echinarachnius parma, Lmk.: *id. l. c.* pp. 315–319, pl.

Mellita sexforis, Lmk., *testudinata*, Kl. (*pentapora*): *id. l. c.* pp. 319–324, pl.

Encope emarginata, Leske (young = *Moulinsia*!), *E. michelini*, Ag.: *id. l. c.* pp. 324–330, pl.

Petalosticha.

Characters by Agassiz, *l. c.* pp. 331 & 332.

Cassidulinæ.

Echinoneus semilunaris, Gm.: Agassiz, *l. c.* pp. 332–335, pl. 14.

Echinolampas depressa, Gr.: *id. l. c.* pp. 335–339, pl. 16.

Neolampas rostellata, Ag.: *id. l. c.* pp. 340 & 341, pl. 17; W. Thomson, *l. c.*, mouth of the Channel.

Rhynchopygus caribæarum, Lmk.: Agassiz, *l. c.* pp. 342 & 343, pl. 15.

Pygaster sp., from the great depths of the West Indies, discovered by Goës, mentioned by Lovén (14), p. 45.

Ananchytinæ.

Pourtalesia miranda, Agassiz, *l. c.* pp. 344–347, pl. 18. W. Thomson (23) distinguishes two spp. nn., *P. jeffreysi*, north of Shetland, 640 fath., and *phyale*, Rockall Channel. According to him, *Pourtalesia* must be an aberrant form in whatever group it may be placed; the apical disk is truly decomposed as in the *Dysasteridæ*.

Homolampas fragilis, Agassiz, *l. c.* pp. 347 & 348, pl. 17.

Spatanginæ.

Echinocardium cordatum, Penn. (*kurtzi*, Gir.), *E. flavescens*, Müll. (*ovatum*), *pennatifidum*, Norm. (*lævigaster*, Ag.): *id. l. c.* pp. 349–352, pls. 19 & 20.

Agassizia excentrica, Ag.: *id. l. c.* pp. 353 & 354, pl.

Brissopsis lyrifera, Forb.: *id. l. c.* pp. 354–356, pls. 19 & 21.

Brissus unicolor, Kl. (*columbaris* &c.): *id. l. c.* pp. 356–358, pl. 22.

Meoma ventricosa, Lmk. (=*Schizaster cubensis*, D'Orb.), *id. l. c.* pp. 358 & 359, pls. 20 & 22.

Metalia (*Plagionotus*) *pectoralis*, Lmk.: *id. l. c.* pp. 360–363, pl. 21. *M. sternalis*, figured by v. Martens (6), pl. 1. fig. 1.

Schizaster fragilis, D. & K., Agassiz, *l. c.* pp. 363 & 364, pl. 21.

Moira atropos, Lmk., *id. l. c.* pp. 365 & 366, pl. 23; *M. stygia*, Ltk. MS., *id.* Bull. 4, Red Sea, Zanzibar.

Rhynobrissus pyramidalis, Ag., *id. ibid.*, China Sea.

Lovenia cordiformis (Ltk. MS.), *id. ibid.*, Guyamas, California.

Spatangus luetkeni, id. *ibid.*, China Sea; *S. raschi*, Lov., abundant in gatherings from Færö to Gibraltar (150–300 fath.), W. Thomson (23).

Hemiaster expergitus, sp. n., from the Josephina bank (lat. 38° 7′ N., long. 9° 18′ W., 550 fath.), mentioned, not described, by Lovén (14, p. 7).

Palæotropus josephinæ, g. & sp. nn., Azores, 200–300 fath., mentioned and shortly characterized as an aberrant type of this group, with labrum and infra-anal fasciola, two genital pores, ambulacra simple, not petaloid, the anterior not impressed nor in any other way different from the other; test oval, regularly vaulted. 11·7 mm. long, 9·1 mm. broad. *Id. l. c.* p. 21.

Lovén's elaborate investigations of the structure and composition of the test of the *Echinidæ* (14) are incapable of satisfactory abstraction, but have been transferred to several widely circulated periodicals. One of the most important results is the author's demonstration, chiefly through the comparative study of *Salenia* and *Marsupites*, that the apical ("genital") plates of the *Echinidæ* correspond to the "*basalia*" of the *Crinoidæ*, the ocular plates of the former to the *radialia* of the latter, the central plate of *Marsupites* and *Salenia* representing the single primary anal plate of the young Sea-urchin!

Agassiz, in his "Revision," discusses the geographical distribution of the littoral species of *Echini*, acknowledging four "realms"—the American, Pacific, Atlantic (Circumpolar), and Australian (Antarctic)—and eighteen districts, or rather geographical categories, encroaching upon each other, and comprising each a greater or less assemblage of species, agreeing more or less in range, viz. the North Pacific, Boreal American, Californian, Panamic, Peruvian, Patagonian, Tropical Atlantic, North Atlantic, Lusitanian,

West-African, South Circumpolar, Indo-Pacific, Indo-African, East-Indian, Pacific, Japanese, Australian, and North Circumpolar.

ASTERIIDÆ.

Asteracanthion (*Stellonia*, D'Orb.) *webbianus*, W. & B., Greeff (11), p. 102, Canaries. *A. tenuispinus*, M. Tr.: number of arms and madreporic plates (2–4) variable; specimens occur with 1–2 larger and a group of 2–6 arms in course of formation; exposed individuals are small, but those in protected localities are larger and more regular, *e. g.* with 7 equal arms and 4 madreporites.

Ophidiaster canariensis, and

Asteriscus arecifiensis, spp. nn., Greeff, *l. c.*, pp. 104 & 105, Canaries.

Archaster tenuispinus, D. & K., *Asterias rosea*, M., and *A. stellionura*, Val., Greenland, in sharks: Lütken (15), p. 95.

Brisinga coronata, sp. n., 200–300 fath., and *Goniaster hispidus*, S., Lofoden I.; *Pteraster multipes*, Dröbak, 60 fath., Hardangerfjord: Sars (19, pp. 1–6, 28 & 29. *P. cribrosus* figured: von Martens (6), pl. 1. fig. 2.

OPHIURIDÆ.

LJUNGMAN (13) notices 57 species or prominent varieties:—39 (14 new) from West-Indian localities; 6 (3 new) from the Azores; 4 (3 new) on the Josephina bank (lat. 36° 45′ N., long. 14° 9′ W.; 5 (4 new) on or off the coast of Portugal. According to him, the tribe *Ophiodermatidæ* (corresponding chiefly with Lütken's *Ophiodermatidæ*, *Ophiochætidæ*, and *Ophiolepidæ*) is divided into two subtribes—the *Ophiodermatinæ* (*Ophioderma*, *Ophiopeza*, *Pectinura*, Fbes., *Ophiopezella*, g. n., *Ophiochæta*, *Ophioconis*, and *Ophiopæpale*, g. n.) and the *Ophiolepidinæ* (*Hemieuryale*, *Ophiarachnella*, g. n., *Ophiolepis*, *Ophiomusium*, *Ophiothyreus*, g. n., *Ophioglypha*, and *Ophiocten*). *Ophiopeza*, Pet., = *Ophiopsammus*, Ltk.; but *O. fallax* is not *Ophiarachna spinosa*, Ljgm., which is type of *Ophiopezella*; *Ophiarachnella* = *Pectinura*, Ltk. *nec* Forbes.

Lyman (16) has examined and identified the originals of most of the *Ophiuridæ* enumerated but not recognizably described by Duchassaing (Anim. Rad. d. Ant.); there seems, however, no sufficient reason to adopt the latter's names in the few cases which have priority.

Ophiodermatinæ.

Conspectus generum: Ljungman (13), pp. 638 & 639.

Ophioderma tonganum, sp. n., Lütken (15, p. 76), Tonga Islands (first indication of this genus in the Indo-Pacific Ocea).

Ophiopæpale differs from the other types of this group, through its long, flexible arms, few (3) arm-spines, and two oral papillæ below each series of dental laminæ, as in *Amphiura*, and from all hitherto described *Ophiuridæ* through the ventral arm-plates being divided into two unequal parts. The very delicate granular investment of the disk covers the radial, oral, and adoral shields and the innermost arm-plates. *O. goesiana*, sp. n., Anguilla, 180 fathoms. Ljungman (13, p. 615).

Ophiolepidinæ (*cf.* Ljungman, 13, pp. 639-641).

Ophiothyreus differs from *Ophiomusium* through the incisions of the disk and the great innermost bifid arm-plate being papilligerous. *O. goesi*, sp. n., Anguilla, 100–300 fath. *Id. ibid.* pp. 619 & 620.

Ophiomusium eburneum, var. *trispina*, Ljgm., Anguilla, 230 fath.; *O. validum*, sp. n., Virgin Islands, 250–300 fath. *Id. ibid.* pp. 618 & 619.

Ophioglypha gracilis, sp. n., Sars, *l. c.* pp. 18–22, Lofoden I., Bodö, Dröbak, 100–300 fath., is regarded by Lütken (15, p. 103) as a southern dwarfed variety of *Ophiocten kroeyeri*.

Hemieuryale. Ljungman (13) and Lyman (16) agree with Lütken that this genus is not an Euryalid, but a true Ophiuroid. Ljungman places it in this group, where it occupies, however, a peculiar position. *Ophiura cuspidifera*, Lmk., is to be referred to it (Lyman, *l. c.*).

Ophiacanthinæ.

The validity of *Ophiothamnus* and *Ophiomitra*, Lym., as distinct from *Ophiacantha*, is contested by Lütken (15, pp. 101 & 102). *Ophiothamnus affinis* and *Ophiacantha smithi*, spp. nn., Ljungman, coast of Portugal, 790 fath.; *Ophiomyces fructosus*, Lym., Josephina bank and Azores, 117–600 fath. (13, pp. 621 & 622); *Ophiacantha abyssicola*, Lofoden I., Bodö, 80–300 fath., *spectabilis*, Bodö, 80–100 fath., *anomala*, Bodö, 150–200 fath., six-armed, viviparous, like *O. vivipara*, Lym: Sars, *l. c.* pp. 6–15, spp. nn. [*O. vivipara* and *Ophioglypha lymani* (*cf.* Zool. Rec. viii. p. 461) are, as the Recorder believes, not from Altata, but *antarctic*, from Patagonia!]

Amphiurinæ.

Ljungman (13) gives a synopsis of the Atlantic species of *Amphiura* and *Amphipholis* (pp. 641–649).

Ophiactis muelleri, var. *5-radia*, St. Barthélemy, Tortola, &c., 8–70 fath.; *O. lymani*, sp. n., Salt I., 30–40 fath.: *id. l. c.* pp. 628 & 629.

Amphiura abyssicola is an *Ophiactis*: Lütken (15), p. 98. (For discussion of the homologies of the oral feet and their papillæ in different genera, *cf. ibid.* pp. 98–101.) *A. sarsi*, Ljgm., =*filiformis*, Sars, Josephina bank, Azores, 30–600 fath.; *A.* sp. (arm-fragments), Anguilla, 280–300 fath.; *A. josephinæ* (? =*grandisquama*, Lym.), Josephina bank, 160 fath.; *A. otteri*, off Portugal, 550 fath.; *A. kinbergi*, Brazil (spp. nn.): Ljungman (13), pp. 630–632 &c.

Ljungman follows Sars (19) in including in the subgenus *Ophiopelte* [*-tis*] not only *O. securigera*, D & K., and *O. borealis*, Sars (*l. c.* pp. 15–17, Bodö, Lofoden I., 80–300 fath.), but also *Amphiura filiformis* and allied species (*sarsi*, *atlantica*) without ambulacral papillæ. *Ophiocnida* is restricted to *A. brachiata*, and *Hemilepis* introduced as a section of *Amphiura* with two very small (sometimes rudimentary) ambulacral papillæ and the ventral side of the disk almost naked (*A. semiinermis*, *flexuosa*, *latispina*, *kinbergi*). *Ophiocnida* (?) *caribea*, sp. n., Anguilla, 300–400 fath.; *Amphilepis norvegica*, off Portugal, 550–790 fath.; *Amphilepis* or *Amphipholis* sp. (arm-fragments), St. Martin, 200–300 fath.: *Amphipholis squamata*, from the Azores and Mediterranean, is separated from the northern *A. tenuispina*, Ljgm., *torelli* (sp. n., Iceland), and *elegans*, Leach; *A. tenera* (West Indies) and *A. tenuis* (New England) are

treated as specifically distinct; *A. kinbergi* and *appressa*, Cape, *patagonica*, Magellan Straits, *lineata*, Azores, 15 fath., *goesi*, Anguilla, 280 fath., *luetkeni*, Tortola, 10 fath., are described as new; *A. pulchella*, Lym., = *A. gracillima*, Stmps.?, St. Barthélemy, 18 fath.; *Ophiocnidella* is introduced as a subgeneric denomination for a section of *Amphipholis* (*A. scabriuscula*): Ljungman, *l. c.* pp. 632–652 & 644–649. *A. septa* is redescribed after an adult specimen from St. Thomas, *A. kochi*, sp. n., Wladiwostok, Mantchuria; *A. andreæ*, sp. n., Java (*A. depressa*, Ljgm., figured for comparison); *Ophiostigma formosa*, sp. n., Formosa Channel, 17 fath. (the genus hitherto only known from the American shores): Lütken, *l. c.* (15) pp. 77–90, pls. 1 & 2, figs. 1–3, 5 & 6.

Ophiaregma, g. n., Sars, Forh. Selsk. Chr. 1872, p. 113, differs from *Amphipholis* in its total want of genital slits; *A. abyssorum*, sp. n. off Storeggen, Norway, 400 fath.

Ophiocominæ and Ophiotrichinæ.

Ophiocoma raschi, sp. n., Sars, *l. c.* p. 109, Storeggen, 80–100 fath.

The distinction of *Ophiomaza*, Lym., from *Ophiocnemis* is contested by Lütken: *l. c.* pp. 102 & 103.

Ophiothrix galateæ, sp. n., Nicobar; *O. echinata*, *5-maculata*, and *fragilis* live in the Mediterranean: Lütken, *l. c.* pp. 90, 101. From the northern species Ljungman (13, pp. 622–626) further separates *O. pentaphyllum*, Penn., British Channel, France, *maculata*, Josephina bank, 110–120 fath., *rubra*, Azores, 15 fath., *lusitanica* (*pentagona*, d. Ch.), Setubal (littoral) (spp. nn.). [That one species should be peculiar to the *British* and another to the *Scandinavian* shores of the North Sea is against all zoogeographical analogy.] *O. pallida*, sp. n., Anguilla, 180 fath., and *O. suensoni*, var. *abyssicola*, ibid., 100–200 fath. (13, pp. 626, 627).

Ophiothela isidicola, sp. n., Lütken, *l. c.* p. 92, f. 4, Formosa Channel, on *Parisis laxa*; *Ophiothela* also occurs in Japan and Bourbon.

Euryalinæ.

Gray, Ann. N. H. (4) x. p. 71, urges the restitution of *Laspalia* and *Natalia* (1840) for *Asteroschema* and *Asteroporpa*, Örst. & Ltk. (1859).

Laspalia (*Asteroschema*) *sulcata*, sp. n., Ljungman, Anguilla (200–300 fath.), 13, p. 637.

Asterophyton agassizi, St., Greenland, in the stomach of the shark; *A. eucnemis*, M. Tr., down to Cape Cod; *A. muricatum*, var. with clavate disk-spines: Lütken, *l. c.* pp. 95 & 96. Lyman notices *A. arborescens*, Lmk., from Guadeloupe, and describes *Asteromorpha lævis*, sp. n. (also noticed by Lütken, with notes on the oral armature of *Asteroschema*, 15, pp. 96–98. *Asteroschema rousseaui*, Michel., from Bourbon, = *Asteromorpha steenstrupi*, Ltk. (which should stand).

Trichaster isidis, Duch., from Guadeloupe, is the type of a new genus, the fifth of the unbranched *Euryalinæ*: *Asterocnida*. "Disk divided into 10 radial lobes by furrows, one for each brachial and interbrachial area; its dorsal surface beset with grains and strong papillæ. Arms bifurcated several times, as in *Trichaster*. Disk and arms invested by a dermal mosaic of flat granules: arm-joints indicated by small crests of grains, often supporting microscopical

hooks; arm-spines denticulate at the extremities, in dense series before the ambulacral pores; dental and oral papillæ and teeth similar, spine-shaped; two genital slits in each interambulacral area, alongside the arms": Lyman, *l. c.*

A few new species from the Red Sea (" *Ophiura*, sp.", " *O. brachyura*") are alluded to, but not described, by Gray (10, p. 117).

Lyman's opinions regarding nomenclature (*cf.* Zool. Rec. viii. p. 460) are criticized by the Recorder (Am. Journ. iii. 1872). *Cf.* also AGASSIZ (2), pp. 11–13.

CRINOIDÆ.

WYVILLE THOMSON (21) records 4 free Crinoids, viz. *Antedon eschrichti*, in the channel between Færö and Scotland, *sarsi*, *rosaceus* (? = *mediterraneus*), and *celticus*, and 3 stalked species—*Rhizocrinus lofotensis*, now found in many deep-sea localities, a new *Pentacrinus*, and the type of the equally new genus *Bathycrinus*, as found in the area explored by the British deep-sea expeditions.

Pentacrinus. The differences between *P. asteria* and *muelleri* are cleared up. In the former the 2nd and 3rd radialia are united by sutures as in the latter; syzygia sometimes occur in intervals along the arms of the latter; and in some specimens of the former a syzygium may be met with here and there. (*P. decorus* is abandoned. The author's statement that the number of arms never exceeds 30 in *muelleri* is incorrect, one of the specimens in Copenhagen having 34, another 44 arms, as pointed out by the Recorder). There are no distinct oral plates in *P. asteria* (as stated by Michelin). Interesting observations are made on the disengagement of the crown and superior part of the stem; and in *P. muelleri* this separation is held to be habitual at a certain stage. This is also the case in *P. wyvillethomsoni*, Jeffr., a species (lat. 39° 42′ N., long. 9° 43′ W., 1095 fath.) intermediate, in some of its characters, between *P. asteria* and *muelleri*. *Id. l. c.* p. 767.

Bathycrinus, g. n., *id. l. c.* p. 772 (*Apiocrininæ*). Stem long and delicate, joints dice-box-shaped, as in *Rhizocrinus*, diminishing in length towards the head, where calcareous laminæ are added beneath the coalesced joints, which form the base of the rays. Five first radials, closely apposed, but not fused together as in *Rhizocrinus*; the centre of each rises into a sharp keel, while the sides are slightly depressed towards the suture, giving the calyx a fluted appearance. Second radials long and free from one another, joining the radial axillaries by a straight syzygial union; a strong plate-like keel runs down the centre of the outer surface; and the joint is deeply excavated on either side, rising again slightly towards the edges. The radial axillary shows a continuation of the same keel through its lower half; and midway up the joint the keel bifurcates, leaving a diamond-shaped space in the centre towards the top of the joint. Arms 10, perfectly single, of few (12) joints, without pinnulæ; first brachial united to the second by a syzygial joint, but after that the syzygia are not repeated. *B. gracilis*, 200 miles south of Cape Clear, 2435 fath.

Lacaze-Duthiers, Arch. Z. expér. 1, pp. x–xii, notes a locality for studying *Antedon rosaceus* and its juvenile state.

CŒLENTERATA

BY

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ANTHOZOA.

1. DANA, J. D. Corals and Coral Islands. London: 1872.

2. DUNCAN, P. M. *Gwynia annulata*, Phil. Tr. 1872, i. pp. 29–40 (*cf.* Zool. Rec. viii. p. 475).

3. ——. Third Report on the British Fossil Corals. Rep. Br. Ass. xli. pp. 116–137.

4. ——. On *Trochocyathus anglicus*, a new species of *Madreporaria* from the Crag. J. G. Soc. xxviii. pp. 447–449, pl. 28.

The other 5 species of British Upper Tertiary Corals are enumerated, and their connexion with the recent European coral-fauna pointed out.

5. GRAY, J. E. Notes on Corals from the South and Antarctic seas. P. Z. S. 1872, pp. 744–747, pls. 62–64.

6. KÖLLIKER, A. Anatomisch-systematische Beschreibung der Alcyonarien. Erste Abtheilung. Die Pennatuliden, iii. 1872. 8 pls. Abh. senck. Ges. viii. (concluded).

7. KONINCK, L. DE. Nouvelles recherches sur les animaux fossiles du terrain carbonifère de la Belgique. Mém. Ac. Belg. xxxix. (15 pls.).

8. KYLE, R. On a probably new species of *Actinia*. Ann. N. H. (4) ix. pp. 304 & 305. [A variety of *A. crassicornis*?]

9. LACAZE-DUTHIERS, H. DE. Développement des Coralliaires. 1. Actiniaires sans polypier. Arch. Z. expér. i. pp. 289–396, pls. 11–16.

10. PANCERI, P. Intorno a due nuovi Polipi: *Cladactis costa* ed *Halcampa claparedii*. Atti Acc. Nap. iv. 1869, pl.

11. ——. Gli organi luminosi e la luce delle Pennatule. *Op.*

cit. v. 1871. 46 pp., 2 pls. Abstracts in Arch. Sc. Nat. 1872; Q. J. Micr. Sc. xii. pp. 248–254; Ann. Sc. Nat. (5) xvi. 8, pp. 13–21 & 39–42.

12. Reuss, A. E. von. Die fossilen Korallen des österr. ungarischen Miocäns. Denk. Ak. Wien, xxxi. pp. 197–270, pls. 1–21.

Important also for the student of recent corals.

13. Sars, G. O. On some remarkable forms of animal life from the great deeps off the Norwegian coast. i. Christiania: 1872.

14. Semper, C. Ueber Generationswechsel bei Steinkorallen, und über das M. Edwards'sche Wachsthumsgesetz der Polypen (zugleich ein Beitrag zur Fauna der Philippinen). Z. wiss. Zool. xxii. pp. 235–280, pls. 16–21.

15. Verrill, A. E. On the affinities of Palæozoic Tabulate Corals with existing species. Am. J. Sc. (3) iii. pp. 187–194; Ann. N. H. (4) ix. pp. 355–364.

Lütken's paper on *Antipathes arctica* is translated in Ann. N. H. (4) x. pp. 77–83. Münter's popular lecture, 'Ueber Corallenthiere' (Berlin: 1872), is of no particular scientific importance.

Anatomy and Evolution.

The last chapter of Kölliker's monograph (6) contains an account of the general results of the special investigations on the anatomy of the *Pennatulidæ*.

Edwardsia. Allman, Q. J. Micr. Sc. lxii. pp. 394 & 395, records facts in the anatomy of this *Actinozoon* tending to show that it differs in many important points from both the Zoantharian and Alcyonarian polypes. He regards it as a very distinct type, occupying an intermediate position between these, and also to be compared with the extinct *rugose* corals of the palæozoic rocks, to which it corresponds in the numerical law of its body-segments, and of which it might in some respects be regarded as a living non-coralligerous representative. According to A. Agassiz, Am. Nat. vi. pp. 770 & 771, *Arachnactis* is only its juvenile or larval state.

Lacaze-Duthiers (9) has elucidated the evolution and morphological structure of the *Actiniidæ*, reconciling what was hitherto partially known of the bilateral evolution of their tentacles, mesenteroid septa, &c., with their typical *radiary* arrangement in cycles or multiples of 6. His observations were made on *Actinia equina* (*mesembryanthemum*), *Sagartia bellis* and *troglodytes*, and *Bunodes gemmacea*. Hermaphroditism appears to be normal in the *Actiniæ*, ova and spermatozoa being developed in alternating septa, or in the same individual septum. The ciliated embryo first gets a mouth, then 2 primary septa perpendicular on the oral slit, dividing the body into two unequal parts; soon 2 septa appear in the greater half, the number of compartments being now 4 (1+3); the lesser half is then divided in the same manner, making the number 6, but only for an instant, 2 new septa (in all 8) appearing on the other side of the primary ones, and so alternately, until the

number 12 is reached, the older compartments and corresponding tentacles always lying nearest to the 2 primary compartments at both ends of the mouth, the youngest nearest to the primary septa. When the number of tentacles is 12, they arrange themselves in two cycles of 6, the inner being larger (often elevated), and the outer smaller (depressed). [The cnidophorous filaments also appear symmetrically, in pairs, quite independently of the supposed sixfold order of appearance.] The next 12 tentacles (making 24) are not developed alternately with cycles I. and II., but *in pairs* in six of the intervals between them; afterwards a new regulation takes place, through the swifter growth of one of the newly formed tentacles of each pair, producing, by this substitution, three cycles, 6+6+12=24, and so on, the new tentacles always budding forth in pairs in the compartments of the smaller tentacles belonging to the highest cycle. The tentacles of the same cycle (I., II., III., &c.) are consequently not homologous, those of the highest cycle (according to the system of Milne-Edwards and Haime, the youngest!) containing, in fact, tentacles of every age, from the oldest to the youngest.

Asexual Reproduction. Reproduction through buds has been observed by SEMPER (14) in 3 species of *Rhodopsammia*, in which the buds remain connected with the nurse polype for a rather long period; and in *Blastotrochus*, where 1–6 buds are formed in a row along each of the edges of the polypary. They are soon detached, leaving a short stem (with septa), from which new buds are probably produced. Sometimes also this basal portion is detached, leaving a scar, from which 2 buds occasionally spring. In *Flabellum* and *Placotrochus* the same species occur both in the attached (pedicellate) and free (truncate) state; *e. g. F. aculeatum* divides transversely into a superior (truncate) portion (*F. oweni, stokesi*) and an inferior (truncate) (*F. spinosum*). The author supposes that the latter has the faculty of regenerating the lost parts and of producing by repeated transversal fission a series of truncate *Flabella*, as *Scyphostoma* produces *Medusæ*. In *Fungia* young disk-shaped individuals are developed upon branched stems, from the summits of which they are severed, following horizontal lines of division. From the alternate dilatations and constrictions of the stems, the author concludes that new *Fungia*-disks are repeatedly developed on and detached from their terminal surface; and he correctly compares their repeated gemmation with the "transversal division" of *Scyphostoma*. Observations are also made on the regenerative power of *Fungia*, and the manner in which fracture or other abnormal conditions (*e. g.* turning over) will induce the formation of compound or budding individuals; and it is shown that *Diaseris* (as suggested also by the Recorder) is not formed through the coalescence of originally distinct lobes, but divides spontaneously or through some extraneous influence into independent individuals, producing through regeneration (in the same manner as the mutilated *Fungiæ*) compound (polystomous) Corals. The artificial divisibility, natural fission, and occasional gemmiparity of the *Anthozoa* (*Actiniidæ* and *Madreporaria*) are discussed by the Recorder in his paper on spontaneous division in the *Radiata* (*ante*, p. 438), where it is pointed out that many phenomena which (*e. g.* in *Euphyllia, Mussa, Mæandrina*, &c.) are described as fissiparity, are in fact gemmiparity—the half-separated or half-united polypites being originally distinct, afterwards more or less coalescing, the systematic value of the presumed difference being of course quite illusory.

Luminosity. The *Pennatulidæ* are provided with special luminous organs in the shape of 8 strings, attached to the external surface of the stomach, commonly in its whole length (in *Cavernularia obesa* only the upper extremity appears to be developed). The luminous power is restricted to these organs, which occur not only in the polypes, but also in the "zooids," and contain cells of the usual yellowish fatty granular matter, discovered by PANCERI (11) in all other instances of phosphorescence.

Geographical Distribution, Local Lists, Coral Reefs. GRAY, Ann. N. H. (4) x. pp. 124 & 125, has published a list of Corals &c. collected by M'Andrew in the Red Sea. VERRILL, Am. J. Sc. (3) iii. pp. 432–437, enumerates 14 species of *Anthozoa* from North Carolina, and mentions some others in his paper "On the Distribution of Marine Animals on the Southern Coast of New England," Ann. N. H. (4) ix. pp. 92–97. GRUBE, Abh. schl. Ges. 1868–69, p. 128, and 1869–72, pp. 143 & 144, enumerates the species observed on the west coast of France; while FISCHER and FOLIN, C. R. lxxiv. pp. 750–753, briefly allude to those found on dredging off Cape Breton, from 24 to 250 fathoms; WHITEAVES, Ann. N. H. (4) x. pp. 345 & 346, to those found in the Gulf of St. Lawrence, and GREEFF (Madeira &c. p. 31) to those observed at the Canaries. SEMPER (14) describes the *Turbinolidæ*, *Eupsammiidæ*, &c. of the Philippines. In the last chapter of his work on the *Pennatulidæ*, KÖLLIKER (6) gives a tabular view of the geographical and bathymetrical distribution of the 120 known species of Sea-pens, and states the general results as to the distribution of the genera, tribes, &c.

DANA'S work (1) discusses the subject more from a geological than a zoological point of view; but the connexion between these is so intimate that some notice of it must be here made. The observations forming the basis of the work were made on the cruise of the Wilkes Exploring Expedition of 1838–42, during which many of the coral islands of the Paumotu archipelago and the Society, Navigator, and Friendly Islands, the Fiji group, several islands north of the Navigator and Fiji groups, including the Gilbert or Kingsmill group, the Sooloo Sea, and Singapore (all reef regions) were explored. The first chapter gives a sketch of corals and coral-makers, not only of the Actinarian and Alcyonarian orders, but also of *Hydrozoa* (*Millepora*) *Polyzoa*, and calcigerous algæ (*Nullipora*); the distribution in latitude and depth of reef-building corals, the local causes influencing their growth and distribution, their rate of growth, &c. are elaborately discussed. The second chapter describes the general features, special characters, and structure of coral reefs (considered under distinct headings as "outer reefs," fringing reefs and shore reefs with no barrier reefs to protect them, and "inner reefs") and "coral islands" (atolls), with detailed accounts of a number of islands, the Florida reefs, and the Bermudas. The third explains the formation of reefs, the causes modifying their form, and their rate of growth; the theory of barrier reefs and atolls is explained (Darwin's explanation of the problems connected with them being accepted); and vivid descriptions of the completed atolls terminate this chapter. The fourth treats of the geographical distribution of coral reefs and islands, and leads naturally to a discussion of the subsidence and elevation in the Pacific. A concluding chapter gives the geological results of this study of the coral formations with regard to the formation of limestone, absence of fossils in such strata, formation of dolomite, &c.

POLYACTINIA (ACTINARIA).

Actiniidæ.

Calliactis sol, and *Paractis rapiformis*, Verr., sp. nn., North Carolina, described: Verrill, Am. J. Sc. (3) iii. pp. 435 & 436.

Cadactis, g. n. Basis adhærens, orbicularis, amplissima. Columna conica, imperforata, sulcata, membranacea, tuberculis subtentaculiformibus, ramosis, capitatis sparsa. Capitula tuberculorum cnidarum strato obtecta. Discus orbicularis, planus, retractilis; radii apparentes. Os amplum, absque tuberculis gonidialibus. *C. costa*, sp. n., Panceri (10, figs. 1–8), Capri (deep water).

Halcampa claparedii, id. *l. c.* figs. 9–16, Posilippo.

Turbinolidæ.

Fungiacyathus, g. n., Sars (13, p. 58, pl. 5. figs. 24–32). Polyparium simplex, liberum, absque vestigio adhæsionis, discoideum vel lamina modo instructum basali horizontali plana, subtus subtiliter radiatim costata, lamina vero murali (theca) nulla. Calyx subcircularis, suprà (septis altis) convexior, margine crispo. Columella nulla; pali nulli. Septa numerosa, systemata 6 et ordines 6–8 formantia, primaria et secundaria valde elevata, arcuata, subtiliter transverse plicata, margine superiore subundulato, usque ad centrum producta, et hìc irregulariter lobata et flexuosa, omnia in tota longitudine discreta, tenuissima, supra marginem exteriorem calycis prominentia. Fossa calicinalis sat magna et æqualiter depressa. *Animal* simplex actiniiforme sanguineum, ore elliptico plicato, tentaculis parvis conico-cylindratis, verrucosis, apice obtuso, non retractilibus, 4–5-seriatis. *F. gracilis*, S. Lofoden Isles (300 fathoms)

Semper describes and figures the following species from the Philippines: *Blastotrochus nutrix*, M.-E. (old specimens, with obliterated bud-scars, not distinguishable from *Flabellum*), *Flabellum irregulare* and *variabile*, spp. nn. (=*stokesi*, *oweni*, *spinosum*, *aculeatum*), *Placotrochus lævis*, M.-E., *Trochocyathus philippinensis*, *Paracyathus rotundatus*, *Heterocyathus philippinensis* and *parasiticus*, spp. nn. (with sipunculi): id. *l. c.* pp. 237–255, pls. 16–20.

Haplophyllia rugosa, Pourt., of very doubtful palæozoic ("rugose") affinities, is refigured, Am. Nat. vi. p. 296.

Eupsammiidæ.

Rhodopsammia, g. n., Semper (14, p. 257). "Polypary single or with lateral buds, free or attached, cylindro-conical or compressed. Epitheca absent or rudimentary. Costæ simple, distinct from the base, close, equal, granular. Calycular fossa rather deep, with a more or less elevated columella composed of convoluted leaflets. Septa narrow, acute, hardly rising above the margin, those of the first cycle equal, extending quite to the columella, those of the second smaller but also connected with the columella, those of the following (often irregular) cycles much narrower, and without exception connected with those of the preceding cycle." (In the system of Milne-Edwards the free *Rhodopsammia* would be referred to *Eupsammia*, the attached to *Balanophyllia*, which the author thinks very unnatural, "leaving it to others to put the other described recent and fossil *Eupsammiidæ* in systematic connexion with those here made known from the Philippines.") *R. carinata*, *amarna*,

parallela, *socialis*, *affinis*, *ovalis*, *dubia*, and *incerta*, id. *l. c.* pp. 257–264, pls. 19 & 20, Philippines.

Heteropsammia michelinii, M.-E., *rotundata*, and *ovalis*, spp. nn., Philippines, *id. l. c.* pp. 264–266, pl. 20; *Endopachys grayi*, M.-E., *id. l. c.* p. 267.

Balanophyllia elegans, Verr., figured, Am. Nat. vi. p. 732.

Fungiidæ.

Diaseris distorta, Mich., *freycineti*, M.-E., Semper (14), pp. 269 & 270, pl. 21, Philippines.

Astrangiidæ.

Verrill unites *Astrangia astræiformis* with *A. danæ*: Am. J. Sc. iii. p. 436.

Alloporidæ.

Stylaster rosso-americanus, Brandt, Z. wiss. Zool. xxii. p. 292 (name only).

Allopora norvegica (first described by Gunnerus as *Millepora norvegica*, and at a later period by Ehrenberg as *A. oculina*), of which old Norwegian specimens are preserved in the Copenhagen Museum, was rediscovered by G. O. Sars during his excursion to "Storeggen," where he also saw something of the characters of the living polype. [The *Stylasteridæ* have been hitherto unknown in this respect; and there is reason to suspect that their systematic position is not correctly understood, their evident affinity to *Errina* and *Distichopora* pointing rather towards the *Hydrozoa* (*Millepora*) than towards the true *Anthozoa*.] Sars has ascertained that the polype is provided with a proboscis, and that the cylindrical tentacula are situated *between* (in true *Madreporaria* above or opposite) the (spurious?) septa. The occurrence at Norway of *Stylaster gemmascens*, Esper, is also confirmed. Forh. Selsk. Chr. 1872, p. 115.

Errina fissurata, Gray (5), p. 745, pl. 62. figs. 5 & 6, Antarctic Ocean.

A revised list, prepared by Verrill, of the Stony Corals and *Antipathacea* described in Dana's 'Report on Zoophytes' is a valuable addition to this author's work on coral reefs &c., as it gives the means of ascertaining at a glance the modern nomenclature of the species. Some novelties are introduced: *e. g.*, *Symphyllia* is merged in *Mussa*, different specimens of the same species sometimes differing in the same way and to the same extent as those two so-called genera, and the only difference given being dependent upon the mode of growth. [But these two genera differ in the same manner as *Manicina* and *Trachyphyllia*, *Pterogyra* and *Euphyllia*; *Isophyllia* and *Symphyllia*, on the other hand, ought to be united.] The reuniting of *Cœnopsammia* with *Dendrophyllia* is perhaps better founded ("in certain species parts of the corallets have the structure of the former genus, and others that of the latter, even in the same specimen; the only distinction made is that *Cœnopsammia* has a smaller number of lamellæ"). *Undaria* is rightly restored for *Pachyseris*, *Orbicella* for *Heliastræa*; but the transferring of *Astræa* to *Favia* of Oken and later authors cannot be approved of. [*Astræa*, Lamarck, 1801, has a double type—*rotulosa*, commonly referred to *Favia*, but in fact a species of *Orbicella*, and *astroites*, Linn. (= *Siderastræa*, Blainv., one of the

Fungiidæ); and Oken certainly was entitled, on dividing the genus *Astræa*, to restrict the name to *A. astroites*. Considering the wide sense in which *Astræa* is used by general writers, it would perhaps be preferable to drop it altogether in scientific nomenclature.]

Relation between the Palæozoic and Recent Corals. VERRILL (15) criticizes the use of the "tabulæ" as a systematic character, and the classification of the *Tabulata* and *Rugosa* with Acalephs. True "tabulæ" are not only found in *Millepora* (Acalephs) and *Pocillopora* (true corals), but also in *Cœlastræa*, *Alveopora* (from which *Favositipora*, Kent, is hardly different), and *Astræopsammia* (Eupsammid); *Columnaria* (Silurian) is apparently closely allied to *Cœlastræa*, *Favosites* (*Koninckia* &c.) to *Alveopora*, *Porites*, &c. Thus the *Poritidæ* range, with slight modifications only, from palæozoic to recent times, and true *Madreporaria perforata* were reef-builders in the earliest epochs; some *Favositæ* grew into masses 8–10 feet in diameter. DUNCAN (3) also discusses this topic, entering into special questions regarding the connexion of types in the series of geological formations, the limits or identity of fossil genera, their systematic arrangement, and the doubts entertained on their possible true position among other tribes (*Alcyonaria*, *Hydrozoa*, and *Polyzoa*). Attention may also be here drawn to the papers of Lindström and Kunth, referred to with others in the introduction to De Koninck's paper on the Carboniferous corals of Belgium (7).

OCTACTINIA (ALCYONARIA).

GORGONIIDÆ AND ALCYONIIDÆ.

Mopsea (*Isidella* olim) *borealis*, sp. n., Sars (13, p. 50, pl. 5. figs. 1–23), Lofoden Isles, 300–400 fathoms [perhaps not the only Isidean of the Norwegian seas; Gunnerus figured long ago an "*Isis hippuris*," which has not been rediscovered].

Mopsella australis, Gray (5), pl. 62. figs. 7–9, pl. 63. figs. 10–12, Antarctic Ocean.

Leptogorgia carolinensis, sp. n., Verrill, Am. J. Sc. iii. p. 432, North Carolina; *L.* (*Xiphogorgia*) *setacea*, Pall. *nec* Dana (=*Juncella*, sp.), almost unnoticed from the time of Pallas until now: *id. ibid.* p. 433.

Anthopodium, g. n., Verrill. Between *Telesto* and *Callipodium*. "Coral with an incrusting firm cœnenchyma, from which arise prominent tubular verrucæ with rather large polypes at the summit. The surface of the cœnenchyma and verrucæ is minutely granular, with rough irregular spicula, closely united together. The spicula are of many forms and sizes, and remarkable for their irregularity and roughness; the most prominent kinds are very roughly warted and spinulose oblong forms and rough lacerate club-shaped ones, many of which are flattened at the large end. Besides these there are numerous rudely spinulose spindles, and an abundance of the small, short, glomerate kinds." *A. rubens*, sp. n., *id. l. c.* p. 435, North Carolina.

Fannyella [!], g. n., Gray (5, p. 745). *Primnoidæ*. "Coral slightly furcately branched; branches club-shaped, enlarging upwards, and then rapidly contracting at the tip; polypiferous cells many, in numerous close concentric

rings, forming regular whorls round the branches, the cells oblong cylindrical, contracted at the base, and each covered with 6 longitudinal series of transverse oblong hexagonal scales, truncate at top, and closed with elongated, more or less acute scales, converging to a point when the animal is withdrawn; axis covered with small scales." *F. rossi*, sp. n., pl. 62, figs. 1–3, Antarctic Ocean.

Thouarella (*Primnoa*) *antarctica*, Val., Falkland Islands, on Burwood Bank, 45 fathoms: Gray, Ann. N. H. (4) ix. p. 482; *id.* (5) p. 746, pl. 64. figs. 1–3.

Hookerella pulchella, id. (5, p. 746, pl. 63. figs. 1–3), Antarctic Ocean.

Jukella, g. n., Gray. "Coral hard, fleshy, forming a thick, smooth, barren stem, marked by irregular longitudinal grooves or ridges, divided at the top into irregular transverse foliaceous expansions, sinuated or lobed on the margins, which are covered with close, retractile polypes on each of their sides. All parts of the coral studded with calcareous cylindrical spicules, which have 4 more or less prominent, separate, transverse plates, which are largest in the middle, and more or less small or rudimentary at the ends." *J. cristata*, sp. n., Hardy's Island, South Pacific. Ann. N. H. (4) ix. p. 481.

The coral-fishery along the coasts of Sardinia is shortly treated by A. Targioni-Tozzetti, 'Relazione sulla pesca a S. E. il Ministro di Agricoltura' &c. Genoa: 1872, 8vo, pp. 18–20.

Anthelia grandis and *Alcyonium aurum*, spp. nn., Red Sea (names only): Gray, Ann. N. H. (4) x. p. 124.

Sydella, g. n., Gray (5, p. 747, pl. 63. figs. 8 & 9). Described from a drawing by Dr. Hooker, representing the apex of a branch [!]. "Coral erect (?), straight, cylindrical, rather tapering, covered with cylindrical cells, tapering at the end and placed in 4 rather irregular series, covered externally with red fusiform spicules placed very close together in a longitudinal direction. Polypes completely retractile, leaving a small rounded end to the cell when retracted." *S. australis*, Gr., Sydney.

Pennatulidæ.

Osteocella, Gray, Ann. N. H. (4) ix. pp. 405 & 406, x. pp. 76 & 406. Notes by Sclater, Moseley, and Dawson, Nature, v. pp. 432, 436, & 516. Sent from Australia as "the backbone of a marine animal caught swimming with great rapidity in shallow water," and described by Gray in Cat. Sea-pens, B. M., under the name of *O. cliftoni* (length 11″), though he considered it very doubtful as one of the *Pennatulidæ*, and even suggested that it might be the "long conical bone of an unknown cuttlefish." The microscopical examination by Carter and Kölliker of a similar very long (64½ inches) slender bone (*O. septentrionalis*), probably from the west coast of North America (Vancouver's Island), leaves no doubt that it is the *axial* style of an unknown *Halipteris* or allied genus, though some still think it to be the backbone of a fish [!].

Umbellularia encrinus (?). Rediscovered (2 small specimens, 410 fathoms) in North Greenland: (Linddahl, *in litt.*) J. E. Gray, Ann. N. H. (4) x. pp. 151 & 469.

The 3rd (concluding) part of Kölliker's work on the *Pennatulidæ* con-

tains the zoographical and anatomical description of the *Renillaceæ* and *Veretillaceæ*, with supplementary remarks on various *Pennatulinæ*. He describes *Renilla reniformis*, Pall., from North Carolina to Brazil, Valparaiso, *mollis*, sp.n., Brazil, *edwardsi*, Herk., S. America; *deshayesi*, sp. n., Brazil, *muelleri* (Schultze), sp. n., Brazil, Mazatlan, *amethystina*, Verr., Panama, Peru, *patula*, Verr., Cumaná, and *peltata*, Verr., Gulf of Mexico. *R. africana*, Köll., Red Sea, *australasiæ*, Gr., Australia, and *sinuata*, Gr., Philippines, are considered doubtful.

Of the *Veretillidæ* the following synopsis can be given :—

KOPHOBELEMNONIEÆ [*sic*]. Sarcosome scanty; a narrow longitudinal ventral zone, without polypes.

A. Polypes, with spicula on the tentacula, placed in 4–6 longitudinal rows.

1. *Kophobelemnon* Asbj. : *C. stelliferum*, Müll., Norway, Scotland, *leuckarti*, Köll., Genoa, *buergeri*, Herkl., Japan, *clavatum*, Stimps., Hong Kong.

B. Polypes, without spicula, placed in short oblique rows, forming together 2 lateral zones.

2. *Sclerobelemnon*, g. n., Köll. : *S. schmeltzi*, Köll., sp. n., Formosa.

VERETILLEÆ. Sarcosome plentiful; spadix invested with polypes all round.

1. Calcareous corpuscles short, biscuit- or lens-shaped; in the spadix only present in the cutis (Lituariidæ).

A. Axial style of the length of the polyparium.

3. *Lituaria*, Val. : *L. phalloides*, Pall., Indian Seas.

B. Axial style only present in the median part of the polypary.

1. Axial style rather long.

a. Polypes without spicula. 4. *Policella*, Gr. : *P. manillensis*, Köll., Philippines, *australis*, Gr., Australia.

b. Polypes with spicula. 5. *Clavella*, Gr. : *C. australasiæ*, Gr., Australia.

2. Axial style rudimentary or absent. 6. *Veretillum*, Cuv. : *V. cynomorium*, Pall., Mediterranean, var. *astyla*, coast of Africa, Canaries.

2. Calcareous corpuscles long, staff-shaped, somewhat depressed, also occurring in the interior part of the spadix.

A. Polypes without spicula, axial style short or wanting. 7. *Cavernularia*, Val. : *C. obesa*, Val., Indian seas, *elegans*, Herkl., Japan, *glans*, Köll., India, *luetkeni*, Köll., Bay of Bengal.

B. Polypes with spicula, axial style long. 8. *Stylobelemnon*, g. n., Köll. : *S. pusillum*, Phil., Mediterranean.

Dubious *Veretillaceæ* : *Veretillum stimpsoni*, Verr., Hong Kong, China Sea; *V. baculatum*, Verr., Okotsk; *Cavernularia valenciennesi*, Herkl. (= *Stylobelemnon pusillum*); *C. haimii*, Rich.; *C. defilippii*, Rich.

New species of *Pennatulinæ* described in the Appendix :—

Pteroides macandrewi, K., Gulf of Suez; *P. durum*, K., Australia; *P. steenstrupi*, K., Java; *Lioptilum grayi*, K., Australia; and two remarkable deep-sea genera :—

Protoptilum, including *P. thomsoni*, 'Porcupine' Expedition, Atlantic,

322 fathoms, *carpenteri*, 690 fathoms, and *smithi*, Josephina bank, sp. nn. and

Bathyptilum, to receive *B. carpenteri*, sp. n., Atlantic, 650 fathoms, 'Lightning' Exped.

These 2 genera are types of 2 new groups, the characters of which will stand thus, compared with those of the *Virgularinæ*:—

Virgularinæ. Polypary long, narrow, distinctly bilaterally symmetrical. Polypes with calyces, placed on the margin of small leaves, or in many oblique rows to the left and right of the keel; "zooids" mostly ventral.

Protoptilinæ. Polypary long, narrow; bilateral symmetry only distinct on the ventral side; polypes with calyces, placed directly on the keel; "zooids" dorsal, ventral, and lateral.

Bathyptilinæ. Polypary short, narrow, distinctly bilaterally symmetrical; polypes without calyces, placed directly in 2 lateral rows on the keel; genital organs produced in the inferior undeveloped polypes; "zooids" ventral.

Crinillum siedenburgi, Banka Sea, 2700 fathoms, is probably founded on the inferior part, with split terminal vesicle, of a Pennatulid.

Argentella, *Pteromorpha*, and *Crispella*, Gray, are not recognized as distinct from *Pteroides*; *P. jukesi* and *oblongum*, Gray, = *lacazii*, K.; *P. pancerii*, Rich., ? = *schlegeli*, Köll.; *P. crispum*, *spinosum*, *grayi*, *vogti*, *cornaliæ*, and *clausi*, Richiardi, = *P. griseum*, Köll. *Sarcophyllum australe*, Köll., = *Sarcoptilus grandis*, Gray; *Pennatula targionii*, Rich., and *P. mollis*, Ald., = *P. phosphorea*, L. (var. *lancifolia*); *Lioptilum undulatum*, Verr., = *Ptilosarcus sinuosus*, Gr.

Kölliker concludes with a discussion of the theory of descent, criticizing the Darwinian hypothesis, and offering a "polyphyletical" one of his own.

HYDROZOA.

1. Allman, G. J. A monograph of the Gymnoblastic or Tubularian Hydroids. Pt. II. (concluded), pp. 155–450, pls. 13–23. London: 1872 (Ray Society).

1st part reviewed in Q. J. Micr. Sc. xii. p. 63 (*cf.* Zool. Rec. viii. p. 469).

2. Brandt, A. Nachträgliche Bemerkungen über fossile Medusen. Mél. Biol. viii. pp. 168–180.

3. Dönitz, —. Ueber die Entwickelung der Zoospermien bei Schwimmpolypen. SB. nat. Fr. 1872.

Not seen by the Recorder.

4. Häckel, E. Ueber Arbeitstheilung in Natur- und Menschenleben. Berlin: 1869.

A popular lecture on polymorphism in compound animals (*Siphonophora* &c.), with woodcuts and an excellent plate illustrating a new Physophorid from the Canaries.

5. Hincks, T. Note on Prof. Heller's Catalogue of the Hydroida of the Adriatic. Ann. N. H. (4) ix. p. 116 *et seq.*

Of 37 species, 2 (*Laomedea dichotoma* and *Coryne pusilla*) cannot be iden-

tified with certainty; 18 (of which 2 are cosmopolitan) are also found in the British seas: 6 appear to be new, and so far had only been met with in the Adriatic; of these, 5 belong to *Plumularia*.

6. Hincks, T. On the Hydroid *Lar sabellarum*, Gosse, and its reproduction. *Op. cit.* x. pp. 313–317, pl. 19.

The substance of this paper, recording the rediscovery of this Hydroid at Ilfracomb, and describing its hitherto unknown blastostyles and planoblasts, is incorporated in Allman's work. The trophosome and gonosome are figured.

7. ——. Contributions to the history of the Hydroida. *Ibid.* pp. 385–395, pls. 20 & 21.

8. Kirchenpauer, G. H. Ueber die Hydroidenfamilie *Plumularidæ*, einzelne Gruppen derselben und ihre Fruchtbehälter. I. *Aglaophenia*, Lx. Abh. Ver. Hamb. v. 3, pp. 52, 8 pls.

9. Kleinenberg, N. *Hydra*, eine anatomisch-entwickelungsgeschichtliche Untersuchung. Leipzig: 1872, pp. 90, 4 pls.

10. Macdonald, J. D. On the anatomy of the nervous system of *Diphyes*, affording presumptive evidence of the existence of a similar system in the other forms of oceanic Hydrozoa. Ann. N. H. (4) ix. pp. 114–116, woodcut.

11. Moulins, C. des. Questions obscures relatives à l'*Hydractinia echinata*, Flem., et à l'*Alcyonium domuncula*, Lmk., tous deux logeurs de Pagures. § 1. Hydractinies. Act. Soc. L. Bord. xxviii. pp. 325–342.

Attempts to prove the identity of *Hydractinia* (*Synhydra*) with *Adamsia* (*Medusa*) *palliata*, Boh. (*Actinia carciniopadus*, Otto, *A. parasitica*, Duj.)!

12. Müller, P. E. Iagttagelser over nogle Siphonophorer. (With a French *résumé*.) Kjöbenhavn: 1871, pp. 82, 3 pls.

The author's observations were chiefly made on *Diphyes sieboldi* (*Eudoxia campanula*) and *Abyla pentagona*. The stem of the young *Diphyes* ends below in an imperfect "polypite," with rudimentary urticating filament, but without "protective scale." This terminal (oldest) polypite and the cartilaginous substance surrounding the "juice-reservoir" is, according to him, *one* individual, the original *Medusa*, the nurse of the colony, morphologically equivalent to a true *Medusa*, or to one of the elements of the colony, viz. a *Eudoxia*. The *Eudoxia*, in the same manner, is considered a *single* individual, consisting of a "protective scale," afterwards assuming the shape of a bell, and the polypite answering to the stomach or "proboscis" of a *Medusa*. The swimming-bells of the *Diphyes* or *Abyla* are morphologically (not functionally) equivalent to the two sexual *Medusa* buds of the *Eudoxia*, the whole Diphyid colony having its nearest analogy in a *Medusa* with proliferous "proboscis," *e. g. Sarsia gemmifera*. This conception of a Siphonophore is somewhat between those of Kölliker and Leuckart; and the author disproves the objections raised against regarding the "scale" and "stomach"

of the *Eudoxia* as parts of the same individual *Medusa*, from their making their appearance independently of each other. The 2nd polypite from the end is better developed; but only the 3rd is a perfect *Eudoxia*, with scale &c. The last (oldest) two polypites are probably destroyed with the successive dissolving of the polypite into distinct *Eudoxiæ*. This is a spontaneous act, originating in a reabsorption of the intermediate portion of the stem, which afterwards forms the 'juice-reservoir' of the *Eudoxia*-bell. In the 2nd part of his dissertation Müller records his observations on the fecundation of the egg of the *Siphonophora*, describing especially the "micropyle"-like structures of the surrounding parts in *Hippopodius*, and the active contact of the transformed amœboid spermatozoa with the germinal spot, without penetration or any other visible mixing of the contents. He adopts the "contact" theory of fecundation.

13. Panceri, P. 1. Études sur la phosphorescence des animaux marins. 2. Du siége du mouvement lumineux dans les Méduses. Ann. Sc. Nat (5) xvi. 8, pp. 4–12, from Rend. Acc. Nap. viii. (1871).

Some *Medusæ* are not luminous; in others the luminosity is restricted to the marginal bulbs at the base of the tentacles; in others, again, to the ovaries or the radial vessels; in *Pelagia noctiluca* the whole external surface is luminous; in *Cunina moneta* only the tentacles and the velum. The author's observations bear especially on these two Acalephs; he ascertained that the seat of the luminosity is in the epithelial cells, and more especially in the fat-like substance deposited in these cells, under the appearance of delicate, yellowish, highly refractile granulations.

14. Rotch, W. D. On a new genus and species of Hydroid Zoophytes. Ann. N. H. (4) x. pp. 126 & 127.

15. Spagnolini, A. Catalogo degli Acalefi del golfo di Napoli. Atti Soc. Ital. xiv. 3 (1871), pp. 83.

Anatomy &c.

Kleinenberg (9), in his investigation of the histological structure and development of the freshwater polype, states that the body is composed of:—an *entoderm*, consisting of a single layer of cells, some of them flagellate, on which devolve all the nutritive (digestive, excretory, &c.) functions; and an *ectoderm*, consisting chiefly of a layer of larger cells, produced into delicate branching fibres, which take a longitudinal direction and form, connected by some homogeneous substance,—a contiguous muscular plate separating the ectoderm from the entoderm. These productions of the ectodermal cells are considered to fulfil the functions of muscles, and the cells themselves those of a nervous system; they are therefore termed "neuromuscular cells." The intervals between their proximal parts are filled up by many small "interstitial cells," wanting only in the foot-disk, but profusely developed in the tentacles; they give origin to the "urticating capsules;" and the spermaries and ovaries are formed through the exuberant growth of parts of this tissue—the spermaries first, 2–20 on the oral part of the body, below the tentacles, the ovaries on its lower part; when these are present in greater number

(*e. g.* 8), the spermaries are also unusually numerous, and partly placed between or below the ovaries, on the foot; ovigerous specimens without testes also occur. There is no reason to regard the generative organs as buds or sexual individuals of a peculiar generation. Most of the cells of the spermary develop into spermatozoa; but of the ovarian cells only one develops into an ovum; the others probably serve for its nourishment; and, though possessing the general character of an egg (germinal vesicle, &c.), it assumes a remarkable pseudo-amœboid shape: when mature it is regularly ovoid, quits its abode, but remains attached to the exterior surface, is fecundated, and goes through the "furrowing" process, which results in the formation of an exterior cell-layer and an interior cell-mass. The cell-layer is transformed into a chitinous egg-shell, separated by an interior cuticular membrane from the cell-mass, which dissolves into a homogeneous plasmodium. In the course of time a body-cavity is formed in the interior of this mass of protoplasm; its external layer is rather suddenly transformed into an ectodermal layer of cells; the shell is by-and-by dissolved or ruptured. The entodermal layer only makes its appearance after the formation of the mouth, some time before the embryo leaves the inner membrane and starts into life, provided with 4–7 tentacles, and with complete differentiation of all its tissues. The animal has the faculty, when in want of food, of reabsorbing its own buds. Jäger's "diasporogenesis" is a mistake, arising from a confusion between the liberated cells of the dissolving polype-body and parasitical true *Amœbæ*.

Hincks (7) observed fissiparous "frustules" in *Campanularia neglecta*, and corrects the description of the "nematophora" (or sarcothecæ) of the *Plumulariidæ*. The "sarcostyle" is generally composed of two parts—an inferior, which alone can elongate itself into "pseudopodia," and a superior, which alone is provided with thread-cells. The function of these organs is probably more nutritive than defensive.

Distribution, Local Lists, &c.

Schultze enumerates the following species as occurring in the Baltic, at Mecklenburg:—*Hydra fusca* and *viridis* (fresh water), *Coryne squamata*, *Campanularia geniculata*, *Sertularia abietina*, *Cordylophora lacustris*, *Aurelia aurita*, and *Cyanea capillata*. Arch. Ver. Mecklenb. xxiii. pp. 205 & 206.

Verrill gives a list of 7 species from the coast of North Carolina: Am. J. Sc. (3) iii. p. 737.

Whiteaves records a few Hydroids from the deep-sea dredgings in the Gulf of St. Lawrence: Ann. N. H. (4) x. p. 345.

Greeff briefly characterizes the hydrozoan fauna of the Canaries ("Madeira," &c. p. 32); and Metzger, Die wirbell. Thiere &c. (*suprà* p. 421), p. 15, adds 4 species to the list of the species of Eastern Friesland. 12 Medusæ, 8 Hydroids, 1 Beroid (*Pleurobrachia rhododactyla*, Ag.), and *Actinia equina* are noticed from the Black Sea by Ulianin (*suprà*, p. 422).

Eleutheroblastea.

Observations on the habits and economy of *Hydra vulgaris* ('Science Gossip,' June 1872), by Fullagar, are recorded in Q. J. Micr. Sc. xii. p. 315.

Gymnoblastea.

The general portion of the second and concluding part of Allman's monograph (1) of the tubularian Hydroids contains the following chapters:—1. On the distribution of Hydroids in space and time, with discussion of the nature and affinities of Graptolites (*Oldhamia*, *Palæocoryne*, and *Corynoides* are not accepted as fossil Hydroids) and a review of the fossil hydroid Medusæ; 2. On the classification of the Hydroida, viz. 5 suborders, *Eleutheroblastea* (*Hydra*), *Gymnoblastea*, *Calyptoblastea*, *Monopsea* (*Æginidæ*), and *Rhabdophora* (Graptolites, &c.); 3. On the homological relations of the *Cœlenterata*; 4. Teratology and Pathology (arising from parasitism and other abnormal conditions); 5. Anatomy of special forms—*Tubularia indivisa*, *Corymopha nutans*, *Clavatella prolifera*, *Cladonema radiatum*, *Hydractinia echinata*, *Gemmaria implexa*, and *Dicoryne conferta*; 6. Supplementary notes on *Cordylophora*, *Protohydra*, &c.

The following is a summary of the systematic portion of Allman's monograph:—

1. Clavidæ. Hydrocaulus rudimental or developed; hydranths with scattered filiform tentacles; gonophores fixed sporosacs.

Clava squamata, Müll., and *multicornis*, Forsk., Northern Seas, *diffusa*, Allm., Shetland, *leptostyla*, Ag., North America, Lancashire, *nodosa*, Wr., Frith of Forth.

Rhizogeton fusiformis, Ag., Massachusetts.

Cordylophora lacustris, Allm., fresh or brackish water, Northern Europe, *albicola*, Kirchp., R. Elbe.

Tubiclava lucerna, Allm., Dublin, Torquay, *fruticosa*, Allm., Tenby.

Merona cornucopiæ, Norm., Shetland.

2. Turridæ. Hydrocaulus rudimental or developed; hydranths with scattered filiform tentacles; gonophores medusiform; planoblasts with simple radiating canals, and single marginal tentacles.

Turris neglecta, Less. (*Clavula gossii*, Wr.), European Seas.

Campaniclava deodoræ, Geg., Sicily.

Corydendrium parasiticum, Cav., Naples.

3. Corynidæ. Hydrocaulus developed; hydranths with scattered or more or less spirally disposed capitate tentacles; gonophores fixed sporosacs.

Coryne pusilla, Gärtn., British shores, *vermicularis*, Hincks, Shetland, *vaginata*, H., British shores, *fruticosa*, H., Exmouth, *ramosa*, Sars, Norway, *cæspes*, sp. n., Allm., Spezzia. Also, doubtfully, *C. nutans*, sp. n., Allm., Shetland, *sessilis*, Gosse, Ilfracombe, *ramosa*, Cham. Eys., English Channel, and (indeterminable) *C. filifera*, *amphora*, and *prolifica*, Gosse, from floating seaweed.

Actinogonium (g. n.) *pusillum*, Van Ben., Belgium (*cf.* Zool. Rec. viii. p. 471).

4. Syncorynidæ. Hydrocaulus developed or not; hydranths with scattered or partly verticillate capitate tentacles, gonophores medusiform planoblasts with 4 radiating canals, and simple (rarely undeveloped) marginal tentacles.

Syncoryne sarsi, Lov., Norway, Cattegat, *loveni*, Sars, Norway, *gravata*, Wr., N. Berwick, Frith of Forth, *mirabilis*, Ag., North America, *pulchella*, Allm., Frith of Clyde, *decipiens*, Duj., L'Orient, *frutescens*, Allm., Dublin, *eximia*, Allm., British shores, *ferox*, Wr., Frith of Forth, *reticulata*, Ag. *S. listeri*, *johnstoni*, and *loveni*, Van Bened., and *C. rosaria*, Ag., are doubtful.

Corynitis agassizi, M'Cr. (*Halocharis spiralis*, Ag.), South Carolina.
Gymnocoryne coronata, Hincks, Devonshire.
Gemmaria implexa, Ald., British shores.

5. Dicorynidæ. Hydrocaulus developed, invested with a perisarc; hydranths with verticillate filiform tentacles; gonophores in the form of natatory ciliated sporosacs, with 2 simple ciliated basal tentacles.

Dicoryne conferta, Ald., North British shores.

6. Bimeriidæ. Hydrocaulus developed, and invested with a perisarc, or rudimental; hydranths with the hypostome not abruptly differentiated; tentacles filiform, in a verticil round the base of the hypostome; gonophores fixed sporosacs.

Garveia nutans, Wr. (*Corythamnion*, Allm.), Frith of Forth, Lancashire.
Bimeria vestita, Wr. (*Manicella fusca*, Allm.), British shores.
Wrightia (g. n.,=*Atractylis*, Wright, pt.) *arenosa*, Ald., British shores.
Hydranthea margarica, Hincks, Ilfracombe.
Stylactis sarsi, Allm., Norway, *fucicola*, Sars, Messina, *inermis*, Allm., Nice.
Heterocordyle conybearii, Allm., Cork, Oban.
Cionistes reticulata, Wr., Frith of Forth.

7. Bougainvilliidæ. Hydrocaulus more or less developed, invested by a conspicuous perisarc; hydranths with the hypostome not abruptly differentiated; tentacles filiform, in a single circlet round the base of the hypostome; gonophores phanerocodonic, with 4 simple radiating canals, and the marginal tentacles simple and distributed either singly or in clusters.

Bougainvillia ramosa, Van Ben., Belgium, British shores, *fruticosa*, Allm., British shores, *superciliaris*, Ag., North America, *carolinensis*, M'Cr., North Carolina, Massachusetts, *muscus*, Allm., Torquay, ? *martensi*, Ag., North Pacific, ? *pusilla*, Sars, Messina.

Diplura fritillaria, Stp., Iceland.

Perigonimus muscoides, Sars, Norway, *repens*, Wr., British shores, *minutus*, Allm., Shetland, *sessilis* and *palliatus*, Wr., and *vestitus*, Allm., Frith of Forth, *serpens*, Allm., Torbay, *linearis*, Ald., Northumberland, ? *bitentaculata*, Wr. *quadritentaculata*, Wr., Frith of Forth.

8. Eudendriidæ. Hydrocaulus developed, invested with a perisarc; hydranths with the hypostome abruptly differentiated from the body, and with a single set of verticillate filiform tentacles; gonophores fixed sporosacs.

Eudendrium ramosum, L., British shores, *rameum*, Pall., Norway, British shores, Mediterranean, *capillare*, Ald., British shores, *arbuscula*, Wr., Frith of Forth, *insigne*, Hincks, British shores, *dispar*, Ag., Massachusetts, *annulatum*, Norm., Shetland, *vaginatum*, Allm., Shetland, *tenue*, Ag., Massachusetts, *racemosum*, Cavol., Naples, ? *cingulatum*, Stm., Grand Manan.

9. Hydractiniidæ. Hydrophyton forming a continuous adherent expansion, its deeper parts consisting of freely intercommunicating tubes of cœnosarc, each invested by a chitinous perisarc, and all adnate to one another by their sides, its free surface overspread by a layer of naked cœnosarc; hydranths with filiform verticillate tentacles; gonophores in the form of fixed sporosacs.

Hydractinia echinata, Flem., British shores, Belgium, France, *polyclina*, Ag., North America.

10. Podocorynidæ. Hydrophyton a continuous adherent expansion formed by adnate and inosculating canals, the deeper part with its component canals invested by a chitinous perisarc, while a layer of naked cœnosarc spreads over the free surface; hydranths with verticillate filiform tentacles; gonophores phanerocodonic.

Podocoryne carnea, Sars, Norway, Frith of Forth, Naples, *proboscidea*, Hincks, Ilfracombe, *aculeata*, Wagn., Adriatic, *areolata*, Ald., Durham, Shetland.

Corynopsis alderi, Hodge, Northumberland.

11. Cladonemidæ. Hydrocaulus developed, invested by a perisarc; hydranths with two kinds of tentacles, one filiform, the other capitate; gonophores phanerocodonic, with the radiating canals more than 4, and the marginal tentacles ramified.

Cladonema radiatum, Duj., British shores, Belgium, France, Messina.

12. Nemopsiidæ. Hydranths with a proximal and distal circlet of filiform tentacles, gonophores medusiform planoblasts with 4 radiating canals, and the marginal tentacles clustered and dissimilar.

Nemopsis gibbesi, M'Cr., Charleston.

13. Pennariidæ. Hydrocaulus developed or not; hydranths with two kinds of simple tentacles, one filiform, the other capitate; gonophores medusiform planoblasts with 4 radiating canals, and one or four more or less developed simple marginal tentacles.

Pennaria cavolinii, Ehrb., Mediterranean, *gibbosa*, Ag., Florida.

Halocordyle (g. n., = *Globiceps*, Ayr., = *Eucoryne*, Leidy, both preoccupied) *tiarella*, Ayr., North America.

Stauridium productum, Wr., British shores.

Vorticlava humilis, Ald., British shores, *proteus*, Ald., Frith of Forth.

Heterostephanus (g. n., = *Heteractis*, preocc.) *annulicornis*, Sars, Norway.

Acharadria larynx, Wr., Ilfracombe.

Acaulis primarius, Stms., Fundy Bay.

14. Cladocorynidæ. Hydranths with both simple and ramified capitate tentacles, gonosome unknown.

Cladocoryne floccosa, Rotch, Guernsey.

15. Myriothelidæ. Hydranth solitary, attached; tentacles scattered, capitate; hydrocaulus not developed; gonophores fixed sporosacs borne on special processes, springing from the body of the hydranth.

Myriothela phrygia, Fab., Greenland, North America, Norway, British shores.

16. Clavatellidæ. Hydranths with simple verticillate capitate tentacles; gonophores ambulatory medusæ, with undeveloped umbrella and branching marginal tentacles.

Clavatella prolifera, Hincks, British shores, Mediterranean.

17. Corymorphidæ. Hydrocaulus solitary, destitute of perisarc; hydranths with a proximal and distal set of filiform tentacles; gonophores medusiform planoblasts with 4 radiating canals, and one or more simple marginal tentacles.

Corymorpha nutans, Sars, Norway, British shores.

Halotractus (g. n.) *nanus*, Ald., Northumberland.

Amalthæa uvifera, Schm., Finland, *sarsi*, Stp., Vestfjorden, *januarii*, Stp., Rio Janeiro.

18. Monocaulidæ. Hydrocaulus solitary, naked; hydranths with a proximal and a distal set of filiform tentacles; gonophores fixed sporosacs.

Monocaulus glacialis, Sars, Varangerfjord, *pendulus*, Ag., Massachusetts.

19. Tubulariidæ. Hydrocaulus developed, invested with a chitinous perisarc; hydranth with a proximal and a distal set of verticillate filiform tentacles; gonophores in the form of fixed sporosacs.

Tubularia (*a*) *indivisa*, L., North seas, *couthouyi*, Ag., Massachusetts, *regalis*, Boeck, Spitzbergen, *insignis*, sp. n., Allm., Dieppe; (*b*) (*Thamnocnidia*, Ag.) *larynx*, Sol., Ell., Britain, Scandinavia, and Belgian shores, *bellis*, Allm., Shetland, *attenuata*, Allm., Shetland and Frith of Forth, *simplex*, Ald., Northumberland, *humilis*, Allm., Ireland, *calamaris*, Van Ben., Belgium, *polycarpa*, sp. n., Allm., Coquimbo, *spectabilis* and *tenella*, Ag., Massachusetts, *pacifica*, Allm. (= *Th. tubularoides*, Ag.); (*c*) (*Parypha*) *crocea*, Ag., Boston, *cristata*, M'Cr., South Carolina, *mesembryanthemum*, sp. n., Allm., Spezzia, ? *aspera*, sp. n., Allm., Coquimbo.

20. Hybocodonidæ. Hydrocaulus developed, invested by a chitinous perisarc; hydranths with a proximal and a distal set of filiform tentacles; gonophores medusiform planoblasts.

Hybocodon prolifer, Ag., Massachusetts.

Ectopleura dumortieri, Van Ben., Ostend, Man.

21. Hydrolaridæ. Hydrocaulus undeveloped; hydranths with but 2 tentacles, which are filiform and spring from one side of the base of the hypostome; mouth with 2 lip-like lobes; gonophores medusiform planoblasts, with 6 simple radiating canals and simple marginal tentacles.

Lar sabellarum, Gosse, Devonshire (*cf.* Hincks, 6).

Eudendrium ramosum, capillare, humile, and *vaginatum*, *Hydractinia echinata*, *Podocoryne carnea*, *Cladonema radiatum*, *Stauridium productum*, *Clavatella prolifera*, *Corymorpha nutans*, *Tubularia indivisa*, *larynx*, *attenuata*, *humilis*, and *bellis* are figured.

Staurocoryne, g. n., Rotch (14). "Stem simple, rooted by a creeping filiform stolon, the whole invested by a polypary. Polypites terminal, clavate, with several (3) verticils of (4) capitate tentacula disposed in the form of a cross." Differs from *Coryne* in its mode of growth, closely resembling that of *Cladonema*, and the cross-like disposition of the tentacula (as in *Stauridium*). Reproduction unknown. *S. wortleyi*, sp. n., in aquaria.

Cladonema radiatum, Duj. An early stage of the planoblast described and figured by Hincks (7, p. 391, pl. 21. fig. 6), with observations on its economy.

The same author (7, p. 393) asserts the generic identity of *Zanclea*, Gegenb., and *Gemmaria*, M'Crady, and regards the branched variety of the trophosome as not specifically different from the low, unbranched variety figured by Allman.

Calyptoblastea.

Schizocladium, Allm., is rejected by Hincks (7, p. 390), who observed the same reproduction by spontaneous fission in *Campanularia neglecta* (pl. 20. fig. 4), and believes it to be far from uncommon among the *Hydroida*. Allman's type species is probably an *Obelia*.

Laomedea gelatinosa, Hell., is probably *Campanularia flexuosa*, Hks.; *C.*

volubilis = *Clytia johnstoni*; *Sertularia ellisi*, Heller, = *Sertularella polyzonias*. *Dynamena pinaster*, Heller, = *Diphasia attenuata*, Hincks; *Thuiaria lichenastrum*, Hell., = *articulata*. *Heteropyxis* and *Anisocalyx*, Heller, are true *Plumulariæ*; *A. setaceus*, Hell., is probably a new sp. (*P. helleri*, Hincks); *A. secundarius*, Hell., a stemless variety of *P. catharina*, J., or some allied species. Hincks (5).

Sertularia carolinensis, sp. n., Verrill, North Carolina, Am. J. Sc. (3) iii. p. 437.

Plumularia cornucopiæ, sp. n., Ilfracombe, Hincks (7), p. 389, pl. 21. figs. 1–3; *P. gracillima*, sp. n., Sars, Forh. Selsk. Chr. 1872, p. 118, Norway, 60–80 fath.

Kirchenpauer (8) distributes the species of *Aglaophenia* into 4 subgenera in the following manner, taking the subgeneric characters partly from the "*nematotheca*," and partly from the "*gonocladia*":—

Plumulariidæ. Thecaphora hydrothecis sessilibus uniseriatis et nematothecis munita. *Aglaophenia*. *Pl.* quarum hydrothecæ nematocalicibus lateralibus binis et nematothecis anticis singulis munitæ, et quarum gonangia gonocladiis affixa sunt.

Subg. 1. *Calathophora* seu *Aglaophenia* vera. Hydrothecæ nematothecas anticas ipsis minores; gonocladia nematocladiis conjunctis, corbulas gonangia includentes clausas præbent. Type *A. pluma*, L. New or little-known species described and figured:

A. dichotoma, Sars, South Africa, Mediterranean, *plumifera*, K., Algoa Bay, *conferta*, K., Cape, Indian Ocean, *pusilla*, K., Algoa Bay, *alopecura*, Suhr, South Africa, *avicularis*, K., Australia, *vitiana*, Fiji Isles.

Subg. 2. *Pachyrhynchia*. Hydrothecæ nematothecas anticas ipsis latiores; gonocladia corbulas cylindricas elongatas habent. Types *cupressina*, *spicata*, Lx., &c.

Subg. 3. *Lytocarpia*. Gonocladium gonangia plura ferens, nematocladiis disjunctis, corbula clausa caret; nematotheca antica hydrothecæ os singulum habet terminale. Type *A. myriophyllum*.

A. secunda, K., Pacific, China sea, Palaos, *crispata*, K., Java, Formosa, *lignosa*, K., Cape, *ramosa*, Busk ?, Australia.

Subg. 4. *Macrorhynchia*. Gonocladium sine corbula gonangium regulariter singulum fert, nematotheca hydrothecæ antica oribus binis (terminali et laterali) munita est. *A. speciosa*, P., *pennatula*, Lx., &c.

A. ramulosa, *brevicaulis*, *longirostris*, Australia, *ligulata*, Algoa Bay, *fusca*, *patula*, Cape, *savigniana*, ? Adriatic, *rostrata*, Singapore, *philippina*, Manilla, *urens*, Java sea, Batang, &c., *longicornis*, *squarrosa*, *rubens*, Australia: Kirchenpauer, *l. c.*

The total number of species described is 66 (14 "incertæ sedis"). The new terms proposed are:—*nematocalyces*, = the chitinous investment of the lateral (paired) nematophora, those of the others (mesial, unpaired) being termed *nematothecæ*; *gonocladia*, those branches of the polyparium to which gonangia are attached; *nematocladia*, the lateral branches of the gonocladia, set with nematothecæ only.

Gymnophthalma and Siphonophora.

Metschnikoff has published (in Russian: Moscow, 1871) a paper on

Siphonophora and *Medusæ*, with 6 plates. Of the species illustrated the most important are:—*Praia medusa, Halistemma pictum, Dipurena fertilis, Bougainvillia cæca, Rhopalonema velatum, Encope polygastrica, Aglaura hemistoma, Tima pellucida, Siphonorhynchus bitentaculatus, Cunina proboscidea* and *striata, Polyxenia leucostyla.*

Anthemodes canariensis, g. & sp. nn., Häckel (4), Canaries.

For P. E. Müller's observations on *Diphyidæ*, *cf. suprà*, p. 461.

According to Brandt (2), the fossil *Acalepha deperdita*, Beyr., has no affinity with the *Trachynemidæ*, but with *Cunina, Eurybia*, &c.

Spagnolini (15) describes the craspedote Medusæ observed at Naples, Messina, and Nice (no new species).

GRAPTOLITHIDÆ.

1. ALLMAN, G. J. On the morphology and affinities of Graptolites. Ann. N. H. (4) ix. pp. 364–389.

Mostly reprinted (with additions) from the author's work on the Hydroids. He argues that the hydrothecæ of Graptolites cannot be correctly compared with the ordinary hydrothecæ of Hydroids, but only with the fixed nematophora of the *Plumulariidæ*: hence the conclusion that Graptolites were, after all, hydrozoan colonies, consisting only of rhizopodal (amœboid) zooids; such are found exceptionally in recent *Plumulariidæ*, in the 'corbulæ,' and in peculiar branches, portions of stems, &c. in certain species. Graptolites are therefore the connecting link between *Rhizopoda* and *Hydrozoa*, viz. *Plumulariidæ* with suppressed true hydrothecæ, the whole nutritive function being given over to the nematophores; and, on the other hand, the *Plumulariidæ* are the only recent *Hydrozoa* which still preserve a vestige of this, in palæozoic times predominant (ancestral?) organization. The "gonangia" observed by Hall and Hopkinson are compared with the leaflets of the "corbulæ"; while Nicholson's "ovarian vesicles" have no connexion with the generative system of Graptolites.

2. HOPKINSON, J. On *Callograptus radicans*, a new dendroid Graptolite. *Op. cit.* x. pp. 233–237, pl. 10.

The dendroid Graptolites (*Dendrograptus, Ptilograptus, Dictyonema*, &c.), wanting the chitinous "virgula" and the "radicula" of the *Rhabdophora*, Allm., were probably all attached in the manner of recent *Sertularidæ*, from which they cannot, as far as their structure hitherto is elucidated, be separated by any character of ordinal value, and to which they are still more nearly related than the true Graptolites.

3. NICHOLSON, H. A. Monograph of the British *Graptolithidæ*. Part I. Edinburgh. (*Cf.* Nature, v. p. 418.)

CTENOPHORA.

1. EIMER, T. Vorläufige Mittheilung über die Nerven von *Beroë*. Arch. mikr. Anat. viii. pp. 646–651.

Incapable of abstraction.

2. Panceri, P. Gli organi luminosi e la luce del Beroidei. Rendic. Acc. Nap. viii. 1872; abstracted in Ann. Sc. Nat. (5) xvi. 8, pp. 59–67.

The seat of the luminosity is a yellowish substance contained in microscopical vesicles surrounding the eight vascular trunks of the costæ, sometimes also continued along their ramifications (*B. rufescens*) or prolongations (*Cestum*). In most of its qualities it resembles the luminous substance discovered by the same observer in *Phyllirhoe*, *Pennatula*, and *Pyrosoma*. Allman's observations on the influence of solar light upon the luminosity of Beroids are confirmed and extended.

On the substance (*Noctilucine*) to which all luminosity in dead and living organisms appears to be due, *cf.* C. R. lxxv. p. 547.

On the *Ctenophora* of the Canaries, *cf.* Greeff's 'Madeira,' p. 32.

PROTOZOA

BY

C. F. LÜTKEN, Ph.D., F.R.D.A.

SPONGOZOA *.

1. BOWERBANK, J. S. Observations on Mr. Carter's paper "On two new Sponges" &c. Ann. N. H. (4) x. pp. 58–61.

2. ——. Contributions to a general history of the *Spongiadæ*. I.–III. P. Z. S. 1872, pp. 115–129, 196–203, 626–635, pls. 5 & 6, 10 & 11, 46–49.

3. CARTER, H. J. Additional information on the structure of *Tethya dactyloidea*. Ann. N. H. (4) ix. pp. 82–84.

4. ——. On two new Sponges from the Antarctic Sea, and on a new species of *Tethya* from Shetland; together with observations on the reproduction of Sponges commencing from zygosis of the sponge-animal. *Ibid.* pp. 409–435, pls. 20–22.

5. ——. Proposed name for the Sponge-animal, viz. "Spongozoon"; also on the origin of thread-cells in the *Spongiadæ*. *Op. cit.* x. pp. 45–51.

6. ——. Description, with illustrations, of a new species of *Aplysina* from the N.W. coast of Spain. *Ibid.* pp. 101–110, pl. 7.

7. ——. Description of two new Sponges from the Philippine Islands. *Ibid.* pp. 110–113.

8. ——. Answer to Dr. Bowerbank's observations &c. *Ibid.* p. 141.

* Although following the classification hitherto adopted in this publication, the Recorder wishes to remark that, in his opinion, the *Spongozoa* should probably form a class by themselves. The natural classification of the lower animals (the *Vermes* of Linnæus), however, is still an open question, and will change with advancing knowledge.

9. Ehlers, E. Die Esper'schen Spongien in der zoologischen Sammlung der K. Universität Erlangen. 1870 (University Programme).

10. Eimer, T. Nesselcellen und Saamen bei Seeschwämmen. Arch. mikr. Anat. viii. pp. 281–284, woodcuts; abstracted in Ann. N. H. (4) x. pp. 306–309, and Arch. Sci. Nat. x. xliv. p. 350.

11. Gray, J. E. Notes on the classification of the Sponges. Ann. N. H. (4) ix. pp. 442–462.

12. ——. Notice of a new netted Sponge (*Meyerella*) from the Philippines. *Op. cit.* x. p. 76.

13. ——. On a new genus of hexaradiate and other Sponges discovered in the Philippine Islands by Dr. A. B. Meyer. *Ibid.* x. pp. 134–139. Also "On the animal of the Glass-rope;" "On the name *Tethya* and its varieties of spelling;" "Marine Sponges in the British Museum." *Ibid.* p. 152.

14. Hackel, E. Die Kalkschwämme, eine Monographie (Bds. 2, and Atlas of 60 pls.). Berlin: 1872.

15. Harting, P. Mémoire sur le genre *Poterion*. Verh. Utr. Gen. ii. 2, 1870.

16. Kent, W. S. Note on *Tethya muricata*, Bow., and *Dorvillia agariciformis*, Kent. Ann. N. H. (4) x. pp. 209–212.

17. Moulins, C. des. Questions obscures relatives à l'*Hydractinia echinata*, Flem., et à l'*Alcyonium domuncula*, Lamk., tous deux logeurs de Pagures. § 2. *Alcyonium domuncula*. Act. Soc. L. Bord. xxviii. pp. 342–356.

18. Sars, G. O. On some remarkable forms of animal life from the great deeps off the Norwegian coast. I. 1872: Christiania (University Programme).

Clark's paper on the American *Spongilla* and the relation of Sponges with the flagellate *Infusoria* is reprinted, Ann. N. H. (4) ix. pp. 71–78, pl. 11. Häckel's on the organization of Sponges and their affinity with *Anthozoa* is analyzed by Giard in Arch. Z. expér. i. pp. iv & v, where also (pp. lxv–lxvii) a review is given of the diametrically opposed views of Häckel and Clark on the nature of Sponges. The same subject is briefly treated in Q. J. Micr. Sc. xii. p. 400.

The richness of the Sponge-fauna of the Canarian Islands is alluded to by Greeff, 'Madeira,' &c. p. 32.

Eight sponges and 5 marine Infusoria (including *Noctiluca*) are noticed by Ulianin (*suprà*, p. 422) from the Black Sea.

Classification, New Genera and Species, &c.

Siliceous Sponges.

Gray (11) gives the following emendation of his classification of the Siliceous Sponges (*cf.* Zool. Rec. iv.):—

A. Thalassospongia *.
  1. *Liospongia.*
    I. *Ceratospongia.*
      a. *Spongiidæ, Ceratellidæ, Hircinïidæ, Dysidïidæ.*
      b. *Chalinidæ, Phacelliidæ, Halichondriidæ, Polymastiidæ.*
      c. *Opisthospongiidæ.*
    II. *Suberispongia.*
      Suberitidæ, Raphiophoridæ, Clionidæ.
    III. *Arenospongia.*
      Xenospongiidæ.
  2. *Acanthospongia.*
    IV. *Hamispongia.*
      Esperiidæ, Desmacidoniidæ, Hamacanthidæ, Gelliidæ.
    V. *Coralliospongia.*
      1. *Pheronematidæ, Lanuginellidæ.*
      2 a. *Euplectellidæ, Hyalothaumatidæ.*
        b. *Macandrewiidæ, Farreidæ, Dactylocalicidæ, Aphrocallistidæ.*
        c. *Corbitellidæ, Asconematidæ.*
        d. *Carteriidæ, Axidæ.*
    VI. *Sphærospongia.*
      1 a. *Geodiidæ.*
        b. *Placospongiidæ.*
      2 a. *Tethyidæ, Donatiidæ, Theneidæ, Lophurellidæ, Casulidæ.*
        b. *Chondrillidæ.*
      3. *Ancorinidæ.*
B. Potamospongia.
  Spongillidæ.

Ehlers (9) has examined the sponges described by Esper, and refers them as follows to now adopted (including 6 new) genera, and adds critical remarks on the limits of genera and families.

Spongia (*Euspongia*) *officinalis* (=*adriatica*, var. *quarnerensis*), *cellulosa*, *agaricina*, *plicata*, Esp.; Cacospongia *cavernosa*, *lamellosa*, Esp.; Spongelia *grossa*, Esp.; Verongia *fistularis* (*Luffaria*); *flabelliformis*, Esp. (*Janthella*); Phyllospongia (g. n.) *papyracea*, Esp.; Platychalina (g. n.) *foliacea*, Esp.; Pachychalina *fibrillosa*, Esp.; Siphonochalina *tubulosa*, Esp.; Clathria *surculosa*, Esp.; Desmacidon *compressum*, *frondosum*, Esp.; Scopalina *cæspes*, sp. n. (Cape); Rhap[h]idophlus (g. n.) *cratitius*, Esp.; Axinella *cannabina*, *verrucosa*, *ventilabra*, Esp. (*Phakellia*); Raspailia *dichotoma*, Esp.; Raspaigella *lyrata*, Esp.; Trikentrion *muricatum*, Esp.; Suberites *manus-diaboli*, ? *cydonium*, Esp.; Homœodictya (g. n.) *digitata*, Esp. (*palmata*, Bow.): Isodictya *cymiformis*,

* *Rectius* Thalassospongiæ; and so with the other names of (necessarily plural) groups.—Ed.

Esp.; Tragosia *caliciformis*, Esp. (*infundibuliformis*, Bow.); Reniera (*Schmidtia*) *clavata*, Esp.; Myrmekioderma (g. n.) *granulatum*, Esp.; Spongia *lycopodium*, Esp., is an *Alga* with a parasitical sponge.

Anatomy and Physiology.

HÄCKEL'S "*Calcispongia*" (14) puts in the shade all papers hitherto published on these organisms; and, surprising as many of the results brought forward in it may appear, they seem to be, on the whole, borne out by facts, leaving little room for criticism, at least until new investigations are on record. The following is a sketch of the general organization of calcareous sponges as now known, chiefly through this author's researches.

The "*Morula*" stage of the embryo is succeeded by the *Planula* stage, the oval fimbriated sponge-larva, the body of which is composed of two cell-layers—an inner of roundish or polygonal nucleated cells, the *endoderm*, corresponding to the inner germ-plate of the embryo of higher animals; and an outer of elongate, prismatic, nucleate, flagellate cells, the *exoderm*, homologous with the outer germ-plate. After the development of a gastric cavity in its interior, and its opening into a mouth, the "*Planula*" is a "*Gastrula*;" when fixed by its aboral extremity, the flagella of the exoderm are withdrawn, and the cells themselves fused together into a "*syncytium*," while the endodermal cells are, on the other hand, transformed into flagellate cells. This stage is termed the "*Ascula*," and passes into the "*Protospongia*" state by the formation of transitory pores perforating the body-wall and establishing water-currents through the motions of the flagella of the endoderm. When calcareous spicula are formed in the exoderm, the young sponge is an "*Olynthus*," the simplest type of the *Ascones*, and hence of all "*Grantiæ*" or *Calcispongiæ*—a cylindrical, clavate or pyriform &c. tube, closed at the extremity by which it is affixed, commonly open by a "mouth" at the other; the body-wall, enclosing the "gastric" cavity, is a thin membrane composed of the two layers named above—the "*syncytium*" or exoderm, a mass of sarcodine with nuclei, the cells of which are so completely fused together that the original cellular structure cannot be made visible through any chemical reaction; if torn mechanically, the fragments will, whether containing one or more or no nuclei, take the shape of *Amœbæ* and walk about. In this layer the spicula are developed, chiefly of three types—simple, 3-radiate, and 4-radiate; anchor-shaped spicula are rare (*Syculmis synapta*, anchoring the animal in the mud bottom); the stellate spicula sometimes occurring are foreign bodies, belonging originally to *Didemna* (*Ascidiæ*). The spicula are invested with a delicate sheath of condensed sarcodine; they contain an axial filament, and are composed of concentric layers, like the siliceous spicula; chemically they are composed partly of CO_2 CaO, partly of an organic substance ("spiculin"). The endodermal cells are, like certain flagellate *Infusoria*, provided with a collar and flagellum; they contain a "nucleus" (with "nucleolus"), and often one or two contractile "vacuola" (water-drops); though without "mouth," they both "drink" and "eat," or receive into their interior, not only fluid but also minutely diffused solid matter (*e. g.* carmine), probably through the soft exoplasm between the collar and flagellum. Liberated artificially they also assume amœboid shape and motions. On the endodermal cells devolve

the whole of the nutritive (digestive, respiratory, and secretory) functions; and there can be little doubt that both eggs and spermatozoa are modified endodermal cells. A cell draws in its "collar" and "flagellum," increases in size &c., a "nucleolinus" makes its appearance; when free the egg assumes the shape of an *Amœba* and moves about, sometimes penetrating into the exoderm, or emigrates, in the oviparous species, from the "stomach" to be fecundated abroad. In a few instances the egg is invested by a thin calcareous shell. The spermatozoa are apparently developed through repeated divisions of modified endodermal cells; the "head" is formed by the "nucleus," the "tail" by the protoplasm of the minute sperm-cells. The author has observed the act of fecundation, which is apparently a penetration into the egg of the spermatozoa, and their subsequent fusion with it. He discovered spermatozoa in species of all families, but only in few species altogether; in these male specimens eggs also were developed. "*Gemmulæ*" never occur in *Calcispongiæ*. The transfusion of the sea-water is effected in the *Ascones* (the simplest type) through unstable microscopical "dermal pores," which open and close at leisure: though their place is, to a certain degree, determined by the meshes of the skeleton, new pores will form independently of their predecessors; under certain circumstances (when over-saturated with food during low tide, or when the water is bad) they will all close up; under others (*e. g.* when put in clear water) they will open again to the utmost: general contractions or dilatations of the whole "syncytium" depend on similar circumstances. The "mouth," whether naked or produced into a "trunk," formed of exodermal tissue alone, may shut up through temporary fusion of the "syncytium" (when crowned with a circle of long "spicula," through the medium of a collar-membrane) and reappear again. The normal course of the fluid is inwards, through the pores into the stomach, by the impulse of its flagellate cells, and out of the mouth; but the reverse may take place; and when the mouth is wanting, either through innate "lipostomy" or through secondary coalescence, a portion of the pores must act as inhaling, another as exhaling orifices. In the *Leucones* the gastric wall (the syncytium) is very thick, but perforated by ramified channels, opening into the stomach with larger "gastral ostia," on the dermal surface with delicate unstable pores, or with larger dermal "ostia;" they can also open or shut, but always in the same definite place. This channel-system may be modified after different types—the dendroid, reticular, vesicular, or glandular; in the last two the flagellate cells and their functions are confined to the larger cavities of the system (the "ampullaceous sacs" in siliceous sponges); in the larger tubes they are deficient, as they are also in the "stomach" of all *Leucones* and *Sycones*. In cases of "lipostomy" also the stomach is sometimes obliterated; in some rare cases it is divided into compartments by perforated exodermal tissue. In the *Sycones* the gastric wall has originally the same structure as in the *Ascones*, but crops out (through a sort of "strobiloid gemmation," according to the author) into a multitude of short radiating cones or tubes, which in some species remain separate, but in others coalesce more or less completely with their borders or surfaces, forming together a system of prismatic or cylindric "marginal cavities," and commonly of triangular, quadrangular, &c. interstitial tubes of astonishing regularity; each of these excrescences has the chief structure of an *Olynthus*. The typically simple *Ascones* may also pre-

sent a very complex appearance, when the individuality of the single "sponge-person" is almost annihilated through the formation (by gemmation, fission, or coalescence) of sometimes very intricate communities, in which the ramified and convoluted "interstitial channels" (though recognizable by being always without endoderm) imitate in a deceptive manner the true gastral channels of the *Leucones*. Sometimes "pseudogasters," "pseudostomes," and "pseudopores," or "pseudostia" are developed; and these have often been confounded with the true "mouths," "stomachs," "ostia," &c., both in calcareous and siliceous sponges, under the name of "afferent" and "efferent" tubes, pores, &c.—denominations which are therefore utterly rejected by the author.

Eimer (10), in a species of *Reniera* (from Capri), has found *thread-cells* (the absence of which is, according to Häckel, the only character separating sponges from *Cœlenterata*) abundantly, developed or in course of development, single or in small heaps, dispersed through the sarcode, gathered around the spicula and the afferent pores, and especially investing the walls of the "stomach," but never on the external surface. In a second species (allied to *Reniera fibulata* and *Desmacella vagabunda*), living on crabs, he found them likewise in all stages of evolution investing the channels opening into the oscula, but none on the external surface. In a third species or variety, however, which occurs with the preceding, and has the same external appearance, well developed thread-cells were only found sparingly, but plenty in various stages of evolution; and in a fourth variety (agreeing partly with *R. informis* and *accommodata*) a different kind of thread-cells was found, dispersed through the whole sponge, but not investing the inner surface of the efferent tubes: some specimens had only the earlier stages; in others none were found; and the same negative results were observed from the examination of numerous other species of *Reniera*, occurring in company with the cnidophorous species, and only to be distinguished from these by the shape of the spicula. Eimer is nevertheless convinced that these thread-cells could in no way have been introduced from without. The value of these observations appears, however, to be diminished by an observation of Carter (5), who, puzzled at first by detecting many thread-cells in the internal parenchyma of a digito-lobulated branched *Reniera*, but none in its dermal layer nor in the surface-layer of the great tubular vents, found that they belonged to "minute parasitical polypes, seated in dilated cavities, apparently of the excretory canals, the head of each polype averaging 100th of an inch in diameter, and supported on a short neck, which ended in a little saccular prolongation that was sunk into the sponge, and charged in its walls and tentacles with thread-cells so numerous that they appeared to exceed in bulk the rest of the polype." He never found thread-cells in sponges without also discovering the parasitical polype from which they originated.

Strange as is Eimer's presumed series of nearly allied siliceous sponges exhibiting the various stages of evolution of the only organ considered distinctive between sponges and the *Cœlenterata*, they yield in interest to his continued investigations of marine sponges, demonstrating an almost regular passage between these and the Hydroids, just as the phylogenetic theory would require it, and of which a short abstract is given in Verh. Ges. Würz. iii. pp. xiii–xvi). In an *Esperia*, in another siliceous sponge allied to *Myxilla*, and in a horny sponge the surface is studded with

small chitinous tubes, which are external prolongations of a similar investment of the whole channel-system, becoming, however, more delicate below, and finally passing into a sarcode-like condition: each of these tubes is inhabited by a retractile sac-like body, provided with ectoderm, a muscular layer, and entoderm, with thread-cells, and with 6–12 long unbranched tentacles with cilia and thread-cells; below, they pass successively into the common sponge-substance, and generally lie four in each channel, each, however, within its own special chitinous tube. In other sponges (*Reniereæ*) these polypoids were found in a lower stage of evolution, with short or absent tentacles, thread-cells present or wanting, no muscular layer, chitinous investment sometimes strongly developed, annular, and projecting—in other instances reduced to a delicate, almost sarcode-like membrane, or almost totally wanting. The idea of parasitism is, according to the author, quite out of the question; the "polypoids" he consequently regards as the true nutritive zooids of the sponge, and the sponges in which they occur in a more rudimentary shape as intermediate forms, leading to the great majority of sponges without nutritive zooids of any kind. As regards the nutrition of sponges, he further asserts that he was often capable of pressing a thick "chymus" through the "mouth" from the "stomach" of calcareous and siliceous sponges, and that in most instances he found it to contain half-digested remains or the entire sucked bodies of small (but never living) *Crustacea*; he therefore thinks that sponges partially feed upon microscopic *Crustacea*!

Contemporaneously with Häckel's discovery of the *spermatozoa* of Sponges, Eimer also discovered true spermatozoids of rather ordinary shape in numerous sponges (calcareous, siliceous, and gelatinous). These are very abundant, but have hitherto been overlooked on account of their great delicacy. [The author's observations are confirmed by Carter, who observed them in 1870: Ann. N. H. (4) vi. pp. 339–340.] As numerous eggs were found in the same specimens, sponges must be considered hermaphrodite. In speaking of intermediary forms between spermatozoa and ordinary flagellate cells, Eimer agrees with Häckel, who regards the first as a modified form of the latter; he inclines, however, to the belief that Häckel (like Lieberkühn and Huxley) did not observe the fully developed fecundating elements [?]; but Häckel's assertion, that he observed the act of fecundation, suggests to Eimer the hypothesis that in some sponges the male element never attains its perfect development, but is nevertheless capable of duly performing its functions!

Observations on the "zygosis" of the "*Spongozoa*" (as Carter proposes to term the flagellate or "monociliated bodies" investing the interior surface of distinct cavities in the sarcodal lining of the areolar cavities), which is compared to that of *Diffugia*, on the development of the young *Tethyæ* from the "ovula," and on that of the spicula are contributed by Carter (4), who, in another paper (5), gives the history of what he considers the true "Sponge-animal" or "Spongozoon," and points out the difference between Clark's views and his own regarding these organic units [which may be regarded as definitely settled by Häckel, *suprà*].

Phyllospongia, g. n., Ehlers (*Ceraospongiæ*). Leaf-shaped, thin as paper, without larger oscula, with a regular mesh of homogeneous horny fibres of equal thickness. Type *E. papyracea*, Esp., Tranquebar.

Platychalina, g. n., Ehlers (*Chalineæ*). Leaf-shaped, with some acute conical prominences and scattered circular oscula, a regular mesh of horny fibres, enclosing single thin spicula, pointed at both extremities. Type *P. foliacea*, Cape of Good Hope.

Rhap[h]idophlus, g. n., Ehlers (*Fibrineæ*). Sponge reticular, with a dense corticate layer of spicula, pointed at one end, obtuse at the other; below it a net of horny fibres, enclosing and surrounded by spicula of the same description, further spinous spicula, symmetrical double anchors and siliceous fibres, bent in various manners. Type *R. craticia*, Esp., India.

Trikentrion [*Tricentrium*], g. n., Ehlers (*Fibrineæ*). Branched, surface rough; internal tissue thickened into horny fibres and rows of spindle-shaped spicula; in the superficial tissue trifid spicula, one branch spinous. *E. muricatum*, Esp., Guinea.

Homœodictya, g. n., Ehlers (*Compagineæ*). No definite shape; tissue with regular net-shaped rows of single spicula, with symmetrical double anchors. Type *H. digitata*, Esp. (*palmata*, Johnst.), Norway.

Myrmekioderma [*Myrmec-*], g. n., Ehlers (*Compagineæ*). Of no definite shape, with a warty crust of crowded spicula pointed at both ends, interrupted by membranous spots with larger and smaller oscula leading into the channel-system of the sponge; internal tissue without horny fibres, but with irregularly arranged smooth or spinous spicula pointed at both extremities. Type *M. granulatum*, Esp., India. Ehlers, *l. c.* (9).

Trichostemma, g. n., Sars (*Corticata*) (18, p. 62, pl. vi. figs. 1–15). Spongia silicea, simplex, libera, in limo demersa et hic fimbria spiculorum setiformium, flexibilium, radiantium sustentata, cortice crasso compacto circumdata, interiore multo minus compacto, parenchymatoso, lacunis numerosis irregularibus trajecto. Oscula numerosa tubiformia in facie superiore libere prominentia. Sceletum ex spiculis acuformibus fasciculato-radiantibus compositum, aliis brevissimis capite globoso in cortice densissime accumulatis, aliis multo longioribus, fasciculos tenues parenchyma et corticem trajicientes formantibus. *T. hemisphæricum*, sp. n., *id. l. c.*, Lofoden Isles, 120–300 fath.

Cladorhiza, g. n., *id. l. c.* p. 65, pl. vi. figs. 16–34. (A remarkable shrub-like siliceous sponge, which might be taken for a Sertularian or Polyzoan.) Spongia silicea ramosa, fasciculis densis spiculorum acuformium axem solidam formantibus sustentata, radiculis numerosis arborescentibus ex spiculis ejusdem generis formatis in limo affixa. Parenchyma axem internam corticis instar circumdans, spiculis superficialibus anchoratis et bihamatis ornatum. Oscula et pori nulla. Ova in apicibus dilatatis ramorum se evolventia. *C. abyssicola*, sp. n., *id. l. c.*, Lofoden Isles, 300 fath.

Hyalonema longissimum, sp. n., *id. l. c.* p. 70, pl. vi. figs. 35–45, Lofoden, the Atlantic, and Greenland Seas. Nearly allied to *H. boreale*, Lovén [therefore no true *Hyalonema*]. The occurrence is announced of a sponge of similar shape in 150–300 fath. in Hardangerfjord, but of an entirely different generic type, according to the spicula.

Grayella cyathophora, Cart. (Zool. Rec. vi. p. 650), is noticed as occurring in the Gulf of Suez, with the following generic diagnosis:—"Sponge massive, expanded or subglobular, attached by an expanded base; outer surface covered with a smooth, fleshy skin, with numerous, regular, equal-sized, flat-topped, low tubercles. Sponge fleshy, with siliceous fusiform elongate spicula of one form." Ann. N. H. (4) x. p. 124.

Caminus osculosus, Grube, Abh. schles. Ges. 1869–1872, pp. 132–134, pl. 2. fig. 3, St. Malo. (2 other species of sponge, from Roscoff, noticed p. 144; a few sponges are also alluded to by Fisher and Folin, C. R. *l. c.* pp. 750–753.)

Harting (15) describes and illustrates the very variable external appearance and the microscopic structure of the great Indian "Neptune's cup" (*Poterion*, Schleg., *Raphidophora*, Gray). Among the numerous variations of shape, one with slender stalk and compressed 2-lipped calyx is separated as *P. amphitritæ*[*-tes*] (pl. 3. figs. 12–16), from the typical *P. patera* (Hardw.) or *neptuni*, Schl.; it is doubtful, however, if they are really specifically distinct. [The irregular cavities in the walls of the cup described by the author are due to the presence of parasitic crabs.]

Tethya dactyloidea, Carter (3): description of structure and comparison with *Tetilla polyura*, O. S. *T. antarctica*, Carter (4), Antarctic Ocean, lat. 74½° and 77½° S., long. 175° W., in 206–300 fath. *T. zetlandica*, Carter, *l. c.*, Shetland Islands. [*Cf.* Bowerbank's criticism on these species (1).] *T.* (*Tethea*) *muricata* and *unca*, Bow., Hammerfest, *T. ingalli*, Australia, *T. norvagica*, from Trondhiem to North Cape, 20–200 fath., described by Bowerbank (2), pp. 115–122, pl. 5.

Geodia macandrewi and *barretti*, Bowerb., *id. l. c.* pp. 196–201, pls. 10 & 11, Norway, 100 fath.; *G. tuberculosa*, Bow., Mexico, *tumulosa*, Bow., Honduras, Jamaica, and *Pachymatisma areolatum*, Bow., Red Sea: *id. l. c.* pp. 626–632, pls. 46–48.

Rossella (g. n.) *antarctica*, Carter, *l. c.*, in company with *Tethya antarctica*, established on spicules entangled by this sponge; peripheral spicula with cruciform heads, the 4 arms covered with spines and spinules; podal spicula with anchor-heads of 4 recurved arms, &c. *R. philippinensis*, Gray, shortly alluded to by Carter (7) and Gray (13).

Halispongia choanoides, sp. n., Bowerbank (2), pp. 122–125, pl. 6, Australia.

Hymeniacidon pulvinatus, Calibert Quay, 20 miles east of Belize, in 8 feet water: *id. l. c.* pp. 126 & 127 ("the largest recent sponge known"). *H. angulatus*, Bow., Madeira: *id. l. c.* pp. 632 & 633, pl. 49.

Aplysina corneistellata, Carter (6), Vigo Bay.

Suberites domuncula. The "oscules virguliformes" mentioned in the original diagnosis are, as observed by Des Moulins (17), due to small *Gammari* installed in the superficial layer of the sponge, which incrusts and envelops shells inhabited by *Pagurus*.

Meyerina (previously *Meyerella*), g. n., Gray (12). Sponge simple, elongate-fusiform, clavate, acute at the apex, at which are placed several tufts of short cylindrical fibres; longitudinal ridges irregularly disposed, often inosculating, leaving variously shaped deep concavities on the surface; the ridges and numerous irregular, often confluent, elevations in the concavities furnished with large oscula of various shape on the upper surface. The sides of the ridges and the tops of the prominences united by a fine cobweb-like netted coat, formed of numerous fibres, and pierced by numerous minute and close perforations. Stem cylindrical, thick, ending in a thick cylindrical tuft of elongated glassy fibre, anchoring the sponge in the sand; numerous cylindrical bunches of fibre are seen through the substance, extending throughout the greater part of the length of the stem. Type *M. claviformis*, Gray, Philippines. The microscopical structure, demonstrating its close affinity

with *Hyalonema*, *Holtenia*, and *Pheronema*, is elucidated by Carter (7). Gray (13) makes it the type of a new family of "*Coralliospongia*"—*Meyerinidæ*.

Crateromorpha (g. n.) *meyeri*, Gray, Philippines. A detailed specific description is given by Carter (7). The generic characters are pointed out in the following manner by Gray (13), who makes it the type of a second new family of "*Coralliospongia*:"—*Crateromorphidæ*. Sponge attached, goblet-shaped; body hollow, vasiform, with a circular mouth, swollen at the bottom, placed at the top of the stem, and of a very different structure from it, the line of demarcation being distinctly marked. Vase rather dilated and thick at the bottom, very thin towards the edge, which is terminated by a very thin membrane-like margin. The outer surface of the base pierced with cylindrical cavities, and covered with a minute network formed of the 4 rays of sexradiate spines, which are so placed as to form square meshes. Internal cavity large, reaching nearly to the bottom of the vase, and furnished at the base with large irregular oscula, which become smaller, more regular, and oblong-lanceolate about the middle and circular in the upper part, gradually diminishing in size as they approach the margin. Stem thick, with numerous parallel longitudinal tubular spaces in a felt of spicules, covered externally with a layer of short robust ones arranged longitudinally, and on this, again, the minute network with square meshes of the club, ending below in a multitude of spiculiferous filaments extending into the sandy mud.

Dorvillia (*Tisiphonia*, W. Thoms.; *Stellata*, O. Schm.) *agariciformis*, Kent, of which *Wyvillethomsonia wallichi*, Wr., is perhaps the embryonic condition, is now referred to *Tethya*, but its difference from *T. muricata*, Bow., upheld against Bowerbank (2): Kent (16) [*cf.* Zool. Rec. vii. p. 506].

Calcareous Sponges.

The following is a synopsis of the "natural" genera and species of the *Calcispongiæ*, after Häckel (14) (already briefly discussed in Zool. Rec. viii. pp. 480 & 481). The number after the names of species indicates the number of "generic varieties."

I. Fam. Ascones. Body-wall thin, perforated by unstable dermal pores, not by permanent channels.

1. *Ascetta*, H.: spiculis 3-cruribus. *A. primordialis*, H. (17), cosmopolitan, *coriacea*, Mont. (8), west coast of Europe, *clathrus*, Schm., Adriatic, *sceptrum*, H., Newfoundland, *blanca*, Mikl. (7), Canaries, Brazil, Philippines, *vesicula*, H., Sandwich Islands, *sagittaria*, H., Great Belt, *flexilis*, H., Singapore.

2. *Ascilla*, H.: spiculis 4-cruribus. *A. gracilis*, H. (6), California, *japonica*, H., Japan.

3. *Ascyssa*, H.: spiculis simplicibus. *A. troglodytes* (2), Capri, *acufera*, H., Spitzbergen.

4. *Ascaltis*, H.: spiculis 3- et 4-cruribus. *A. canariensis*, H., Canaries, *cerebrum*, H., Adriatic, *darwini*, H., Indian Ocean, *lamarcki*, H., Atlantic, *gegenbauri*, H. (3), Messina, *gæthii*, H., Naples, *botryoides*, H., Atlantic, Europe.

5. *Ascortis*, H.: spiculis 3-cruribus et simplicibus. *A. horrida*, Schm., Florida, *lacunosa*, Bean, Great Britain, *fabricii*, Schm., Greenland, Newfoundland, *corallorhiza*, H., Greenland, Norway, *fragilis*, H. (2), North Atlantic.

6. *Aseulmis*, H.: spiculis 4-cruribus et simplicibus. *A. armata*, H. (2), Norway.

7. *Ascandra*, H.: spiculis 3–4-cruribus et simplicibus. *A. cordata*, H. (2), Cape, *falcata*, H. (7), Adriatic, *densa*, H. (3), S. Australia, *panis*, H., Florida, *reticulum*, Schm. (7), Adriatic, *contorta*, Bow. (3), British Channel, *complicata*, Mont. (3), N. Atlantic, *lieberkuehni*, Schm. (3), Mediterranean, *echinoides*, H. (3), Gibraltar, *sertularia*, H., Java, *botrys*, H., Great Britain, *nitida*, H. (4), Cape, *pinus*, H., Normandy, *variabilis*, H. (11), East Atlantic.

II. Leucones. Body-wall thick, perforated irregularly by branching, often anastomosing, channels.

1. *Leucetta*, H.: spiculis 3-cruribus. *L. primigenia*, H. (7), cosmopolitan, *trigona*, H., Cape, *sagittata*, H., California, *pandora*, H., S. Australia, *corticata*, H., Cuba.

2. *Leucilla*, H.: spiculis 4-cruribus. *L. amphora*, Schm., Antilles, *capsula*, H., Cape.

3. *Leucyssa*, H.: spiculis simplicibus. *L. spongilla*, H., Japan, *cretacea*, H., Kamtschatka, *incrustans*, H. (4), Norway, Devonshire.

4. *Leucaltis*, H.: spiculis 3- vel 4-cruribus. *L. floridana*, H. (3), Florida, *crustacea*, H., Caraccas, *pumila*, Bow. (3), Guernsey, Mogador, Cape, Bass's Strait, *solida*, Schm. (7), Mediterranean, *bathybia*, H., Red Sea, *clathria*, H., Florida.

5. *Leucortis*, H.: spiculis 3-cruribus et simplicibus. *L. pulcinar*, H. (7), Red Sea, Indian Ocean.

6. *Leuculmis*, H.: spiculis 3-cruribus et simplicibus. *L. echinus*, H., Norway.

7. *Leucandra*, H.: spiculis 3–4-cruribus et simplicibus. *L. egedii*, Schm. (2), Greenland, *caminus*, H. (4), Atlantic, *gossii*, Bow. (8), Great Britain, Normandy, *crambessa*, H. (4), Mediterranean, *alcicornis*, Gr. (6), Cape, Indian Ocean, S. Australia, Pacific, *lunulata*, H., Cape, *aspera*, Schm. (9), Mediterranean, *fistulosa*, Johnst., Great Britain, *ananas*, Mont. (2), North Atlantic, *cataphracta*, H., Australia, *cucumis*, H., Indian Ocean, Australia, *bomba*, H., Fiji Isles, *nivea*, Grant (4), Atlantic, Europe, *johnstoni*, H. (5), Great Britain, *ochotensis*, Mikl., Okotsk, *stilifera*, Schm., Greenland, *saccharata*, H. (4), Bass's Straits.

III. Sycones. Body-wall thick, composed of straight unbranched radial tubes.

1. *Sycetta*, H.: spiculis 3-cruribus. *S. primitiva*, H., Bass's Strait, *sagittifera*, H., Ceylon, *strobilus*, H., Honolulu, *cupula*, H., Japan, *stauridia*, H., Red Sea.

2. *Sycilla*, H.: spiculis 4-cruribus. *S. cyathiscus*, H., S. Australia, *urna*, H., Caraccas, *cylindrus*, H., *chrysalis*, Schm., Adriatic.

3. *Sycyssa*, H.: spiculis simplicibus. *S. huxleyi*, H., Adriatic.

4. *Sycaltis*, H.: spiculis 3- et 4-cruribus. *S. conifera*, H., Adriatic, *perforata*, H. (2), Florida, *glacialis*, H., Arctic, *testipara*, H. (2), Cuba, *ovipara*, H., Florida.

5. *Sycortis*, H.: spiculis 3-cruribus et simplicibus. *S. lingua*, H., Newfoundland, *quadrangulata*, Schm. (4), Mediterranean, European Atlantic, *levigata*, H., S. Australia.

6. *Syculmis*, H.: spiculis 4-cruribus et simplicibus. *S. synapta*, H., Bahia.

7. *Sycandra*, H.: spiculis 3–4-cruribus et simplicibus. *S. ciliata*, Fab. (9),

North Atlantic, *coronata*, Ell. & Sol. (3), European Atlantic, Mediterranean, Pacific, *ampulla*, H. (4), Atlantic, S. America, *raphanus*, Schm., Mediterranean, Red Sea, Indian Ocean, Australia, Japan, *capillosa*, Schm. (3), Adriatic, *setosa*, Schm., Mediterranean, *villosa*, H. (2), European Atlantic, Mexican Gulf, *schmidti*, H., Adriatic, *arborea*, H., Australia, *alcyoncellum*, H., Indian Ocean, *elegans*, Bow. (2), Mediterranean, European Atlantic, Canaries, Antilles, Cape, *humboldti*, Risso, Adriatic, *glabra*, Schm., Mediterranean, European Atlantic, *arctica*, H. (3), Greenland, Spitzbergen, *ramosa*, H., Cape, *compressa*, Fab. (9), *utriculus*, Schm. (2), North Atlantic, *hystrix*, H., S. Africa.

This "natural system" is followed by an "artificial system," based on "generic" characters, formerly considered valid, but the instability of which is now demonstrated (for 'Prodromus,' *cf.* Zool. Rec. vi. p. 674). These characters are also used for the definition of the so-termed "generic varieties" of the species; though many species are hitherto only found in one of these, the general rule is that the range of individual variation is in many instances enormous and astonishing, and the structure of certain specimens of typically simple species perplexing and intricate. Many species are further differentiated into specific ("beginning species"), connective, and transitional varieties, intimating transitions into other species or connexions with other genera. Special chapters are devoted to the geographical and bathymetrical distribution ("Chorology"). *Calcispongiæ* are mostly littoral.

RHIZOPODA.

1. Ehrenberg, C. G. Uebersicht der seit 1847 fortgesetzten Untersuchungen über das in der Atmosphäre unsichtbar getragene reiche organische Leben. Nachtrag dazu. Abh. Ak. Berl. 1871, pp. 1–150 & 233–275, pls. 1–3.

2. ——. Mikrogeologische Studien als Zusammenfassung seiner Beobachtungen des kleinsten Lebens der Meeres-Tiefgründe aller Zonen und dessen geologischer Einfluss. MB. Ak. Berl. 1872, pp. 265–322.

3. Fischer, P. Foraminifères marins du département de la Gironde et des côtes du sud-ouest de la France. Act. Soc. L. Bord. xxvii. pp. 376–397.

76 species: *cf.* C. R. lxxiv. p. 751, on the *Foraminifera* dredged off Cape Breton.

4. Grimm, O. Ueber eine neue Süsswasser-Radiolarie. Arch. mikr. Anat. viii. pp. 531–534, pl. 21 A.

5. Parker, W. K., and Jones, T. R. On the nomenclature of the *Foraminifera*. Pt. XV. The species figured by Ehrenberg. Ann. N. H. (4) ix. pp. 211–230, 280–303; x. pp. 184–200, 253–271, 453–457.

6. Wagner, N. *Myxobrachia cienkowskii*, n. sp. Bull. Pétersb. xvii. p. 140; Q. J. Micr. Sc. xii. p. 413.

O. Schmidt's paper on Coccoliths and Rhabdoliths (*cf.* Zool. Rec. viii. p. 489) is translated in Ann. N. H. (4) x. pp. 359–370, pls. 16 & 17.

Whiteaves mentions shortly the *Foraminifera* and *Polycystina* found by deep-sea dredging in the Gulf of St. Lawrence: Ann. N. H. (4) x. pp. 343 & 344. Greeff ('Madeira,' p. 33) refers to those of the Canaries, and Metzger (*suprà* p. 421) adds a few species to the list of the *Foraminifera* of the East-Friesland coast, p. 15. The mud bottom of the innermost parts of Hardangerfjord, at 500 fathoms, according to G. O. Sars (Forh. Selsk. Chr. 1871, p. 250), is filled with an enormous number of brownish bodies, of the shape and size of small hail-stones (*Saccammina sphærica*, Sars, MS.). In their company long radiating stems of a light brownish colour (*Rhabdammina abyssorum*, Sars, MS.) and some rhizopodous organisms, very like Annelidan tubes (*Bathysiphon filiformis*), were found: 13 other species of *Rhizopoda* and *Spongozoa* are enumerated from this deposit. Archer shortly mentions various Irish freshwater *Rhizopoda*, *Flagellata*, &c.: Q. J. Micr. Sc. xii. F. Stuart, Z. wiss. Zool. xxii. p. 290, shortly describes the gemmiparous propagation of *Collozoum inerme*.

Elaster greeffi, g. & sp. nn., Grimm (4), in peat-swamps at Novgorod. A globular mass of finely granular protoplasm, enclosed in a fenestrate siliceous shell and including a central capsule, from which delicate lines radiate towards the periphery, probably axial cylinders of the numerous delicate pseudopodia radiating from the surface of the ball.

Myxobrachia cienkowskii, sp. n., Wagner (6), Naples. No proper body-walls, only a partial covering of confluent filaments, from which numerous pseudopodia emanate, the body not being formed of a gelatinous homogeneous mass, but of a felt of delicate protoplasmic threads, between which delicate cytodes are imbedded. Coccoliths, coccosphores, shells of young *Bivalvia*, *Spirulina*, &c. were found imbedded in the extremities of the arms.

Thalassicolla cienkowskii, sp. n., Wagner, *l. c.*

Traquairia, g. n., Carruthers, Q. J. Micr. Sc. xii. pp. 397 & 398. A radiolarian Rhizopod from the Coal-measures.

Pelobius, Greeff (*nec* Schönh., *Col.*), Zool. Rec. vii. p. 517: changed to *Pelomyxa*. Greef, SB. Ges. Marb. 1872, p. 169.

Ehrenberg (1) gives an historical and systematic review of the *Arcellinæ*, which are distributed as follows:—

I. Arcella. Loricæ apertura laterali aut medio-infera, pseudopodio simplici aut multiplici, plano aut filiformi.

1. *Homœochlamys**. Lorica inermis, suborbicularis aut oblonga, lævis aut subtiliter sine ordine punctata, aut nebuloso-maculata, interdum costata: *a*, orbiculares, 6 spp.; *b*, oblongæ, 10 spp.

2. *Sticholepis**. Lorica inermis, orbicularis aut oblonga, areolarum aut assularum seriebus ornata: *a*, orbiculares, 3 spp.; *b*, oblongæ, 5 spp.

3. *Centropyxis*, St. Lorica varia, aculeata aut setosa: 3 spp.

4. *Heterocosmia**. Lorica inermis, superficie areolis sine ordine cælata, suborbicularis aut oblonga: *a*, orbiculares, 4 spp.; *b*, oblongæ, 4 spp.

* These divisions, and those similarly marked on p. 484, are apparently new, so far as can be judged from Ehrenberg's paper.

5. *Cyphidium*. Lorica inermis non areolata, tuberculis obsita, pseudopodio simplici dilatato nec filiformi: 1 sp.

II. DIFFLUGIA. Lorica varia, urceolaris aut lageniformis, interdum curvata et uncinata, nonnunquam limo incrustata, apertura frontali, pseudopodio simplici aut multiplici attenuato, filiformi aut ramoso.

1. *Exassula**. Lorica inermis oblonga, ovata aut subglobosa, varia, superficie lævi simplici aut irregulariter punctata, apertura dentata aut edentata: *a*, edentatæ (*Lagynis*), 14 spp.; *b*, dentatæ (*Crossopyxis**), 10 spp.

2. *Assulina**. Lorica inermis oblonga, ovata aut subglobosa, varia, apertura lævi aut dentata, superficie areolarum aut assularum seriebus ornata: *a*, edentatæ (*Hologlypha**), 17 spp.; *b*, dentatæ (*Euglypha*), 18 spp.

3. *Setigerella**. Lorica setosa aut aculeata, oblonga, ovata aut subglobosa, superficie varia. Species notæ omnes dentatæ: 5 spp.

4. *Reticella** [Gray, Actinozoa, 1870]. Lorica inermis oblonga, ovata aut subglobosa, superficie sine ordine assulis, areolis, aut cellulis reticulata: *a*, edentatæ (*Allodictya**), 9 spp.; *b*, dentatæ (*Odontodictya**), 7 spp.

5. *Corticella**. Lorica inermis oblonga, ovata aut subglobosa, simplex aut spiralis, crusta aliena mutabili obducta: *a*, edentatæ (*Lequereusia*), 7 spp.; *b*, dentatæ, 1 sp.

6. *Lirella**. Lorica inermis oblonga, superficie liris longitudinalibus ornata: *a*, edentatæ (*Cadium*, Bail.), 2 spp.; *b*, dentatæ (*Eucadium**), 2 spp.

54 species of *Difflugia* and 22 of *Arcella* are briefly characterized and for the most part figured: the total number registered is 148.

In the appendix to EHRENBERG's paper (2) on the microscopical organisms of the sea-bottom, 90 new species of *Polythalamia* are briefly described, 113 new species of *Polycystina*, several *Arcellæ* and *Difflugiæ*, &c. The following new genera are proposed:—

POLYTHALAMIA: *Aspidodexia* (habitus *Aristeroporæ*, spira sinistro imperforato latere aperta, in dextro perforato latere obtecta); *Bolbodium* (globosum, *Globulinæ* affine; ostium amplum, rotundum, laterale nec terminale, cellulæ involventes); *Hemisterea* (habitus *Rotaliæ*, latere dextro poroso, sinistro integro); *Hemisticta* (æqualis *Rotaliæ*, latere sinistro poroso, dextro integro); *Otostomum* (*Polymorphinæ* characteres in statu juvenili; superiores cellulæ singulas inferiores ita involventes ut seriem simplicem forment; apertura sub apice cellularum, renis aut auris habitu, laterali, emarginata, ampla); *Polydexia* (*Globigerinæ* characteribus instructæ formæ, quæ spiram in sinistro et aperturam amplam in dextro latere gerunt).

POLYCYSTINA: *Pteractis* (corpuscula triradiata, irregulariter spongioso-cellulosa, medio concentrico, radiis apice acutis subspinosis, connecticulo radiorum membranaceo tenui, laxe subtiliter celluloso, apices non involvente); *Stylactis* (*Rhopalastrum* radiis stiliformibus nec clavatis).

GREGARINÆ.

1. BENEDEN, E. VAN. Notice sur la structure des Grégarines. Bull. Ac. Belg. (2) xxxiii. p. 210, pl.

2. ——. Remarks on the structure of the *Gregarinæ*. Q. J. Micr. Sc. xii. pp. 211–218, pl. 11.

3. Lankester, E. Ray. Remarks on the structure of the *Gregarinæ* and on the development of *G.* (*Monocystis*) *sipunculi*, Köll. Q. J. Micr. Sc. xii. pp. 342–351, pl. 20.

In the adult *G. gigantea*, Van Beneden (1, 2) distinguishes the following layers:—(1) A central medullary parenchyma, appearing as a dark band occupying the axis of the body, and composed of a granular substance, much more fluid than (2) the cortical parenchyma, a slimy protoplasmic matter, less granular and clearer. The longitudinal striation often observed is due to ridges and channels of the inner layer; but they will appear and disappear, and are only to be regarded as momentary foldings, not as being of a muscular nature. (3) A thin layer, containing numerous regular transverse fibrils or rings, to which the author ascribes the character of true muscular fibres. This layer forms also the partition against the anterior chamber, but only invests its basal portion. (4) The cuticular layer. Having demonstrated this high degree of differentiation in a *monocellular* organism, the author asks whether the *Infusoria* might not also be monocellular animals, as was once believed.

Lankester (3) criticizes Van Beneden's conclusions regarding the muscular layer. It is absent in many *Gregarinæ*, and when present affords no evidence of contractility: it is, according to Lankester, only internal thickenings of the cuticular layer. The seat of contractility is in the *cortical* layer, as demonstrated in *Monocystis ascidiæ* and *nereidis* (pl. 20. figs. 1 & 2), where the cortical layer in the anterior portion of the body is fibrous and eminently mobile. Lankester has further examined *M. sipunculi*, found free, floating, or encysted in the visceral cavity of *Sipunculus nudus*, and figures various stages in its development, answering perfectly to those observed by Van Beneden in the gregarine of the lobster; the amœboid stage, however, was not observed; but (1) pseudonaviculæ with a single immobile filament, (2) monerian pseudofilarian forms, (3) pseudocercariæ, with a motionless nucleated head and a vibratile structureless tail, (4) monocystic gregarines multiplying by longitudinal fission, (5) monocystic bean-shaped gregarines of $\frac{1}{250}$ of an inch in length, (6) free and encysted monocystic gregarines, attaining a diameter of $\frac{1}{4}$ of an inch (*l. c.* pl. 20. figs. 3–18), were observed. The "pseudonaviculæ" of *M. sænuridis* are also described and figured (fig. 19).

Van Beneden's previous researches on the evolution of *Gregarinæ* are reprinted in J. Zool. i. pp. 134–165, and an abstract given in *Arch. Sci. Nat.* 1872, pp. 256–260, translated in Ann. N. H. (4) x. pp. 309–312.

INFUSORIA.

1. Bastian, H. C. On some heterogenetic modes of origin of flagellated Monads, Fungus-germs, and Ciliated Infusoria. P. R. Soc. xx. pp. 239–264.

Among the author's observations on the development of small organisms in the "proligerous pellicle" forming on the surface of an infusion of hay exposed to the air, two may be especially noticed, viz.:—the development of

flagellate *Infusoria* (Monads) from aggregations of *Bacteria* into segmenting "embryonal areæ," their subsequent transformation into *Amœbæ*, and final dissolution into *Bacteria*; and the analogous tracing of the heterogenetic evolution of *Paramecium* (*Nassula*) from spontaneous aggregations of the granular elements of the pellicle. Apparently monads, *Amœbæ*, or *fungus*-spores may develop quite arbitrarily from similar "embryonal areæ," or from homogeneous plasmatic globules. According to the author's observations, the heat used in the preparation of the infusion will determine if, according to the greater or lesser deterioration of the organic substance, the ultimate results shall be a fungus, a flagellate, an Amœboid, or a ciliate Infusorian. [These observations are chiefly confirmations of experiments made by Pouchet and others; but a critical repetition of them by equally competent observers of opposed views would be highly advisable.] On the question of "Heterogenesis" and "Archebiosis,' *cf.* Hartley and Crace-Calvert, P. R. Soc. xii. pp. 140–157 and 185–191; Calvert, Sanderson, and Ferrier, Rep. Br. Ass. xli. pp. 122–126.

2. Grimm, O. Ueber *Synura urella*, Ehrbg., und *Uroglena volvox*, Ehrb., und den wahrscheinlichen genetischen Zusammenhang der Catallacten mit den Schwämmen (vorläuf. Mittheil.). Nachr. Ges. Götting. 1872, pp. 539 & 540.

Synura and *Uroglena* belong to the "*Catallactæ*," and differ only from *Megasphæra* through the possession of a single flagellum. After the dissolution of the colony the individuals change into *Amœbæ* and encyst; they also propagate through fission (budding). They are perhaps only a peculiar generation in the life-cycle of Sponges!

3. Futtle, Albert. One of our common Monads (*Urella glauconia*, Ehrbg.?). Am. Nat. vi. pp. 286–289, woodcuts.

4. Marchand, Léon. De la reproduction des Animaux infusoires. (Étude médico-zoologique.) Paris: 1869. 2 pls.

A review of what is known on the reproduction, encystment, &c. of *Infusoria*. The author's attempts to prove the probability and accordance with nature of the heterogenetic (spontaneous) formation in organic liquors of the micro-organisms active in epidemic diseases, fermentations, &c., fall beyond the limits of this Record.

5. Rossbach, M. J. Die rhythmischen Bewegungserscheinungen der einfachsten Organismen und ihr Verhalten gegen physikalische Agentien und Arzeneimittel. Verh. Ges. Würz. ii. (1872), pp. 179–272.

Observations on the contractile vacuoles of *Infusoria* and *Amœbæ*, and on the influence of temperature, electricity, chemical and other agencies on the rhythmical contractions and retractile motions in *Infusoria*.

W. S. Kent has laid before the Roy. Micr. Soc. observations on the minute collared flagellate *Infusoria* (*Codosiga*, *Bicosœga*), the striking resemblance of which to the cells lining certain cavities in Sponges was first pointed out by Clark. Of this tribe, not hitherto observed in Europe, Kent has examined

11 species, of which he identified 5 as also American. Q. J. Micr. Soc. xii. p. 98.

Greeff's paper on the *Vorticellidæ* (*cf.* Zool. Rec. vii. & viii.) is translated in Ann. N.H. (4) ix. pp. 105–112, 196–210, 384–397, and 462–473 : *cf.* Allman's note "On some points in the development of *Vorticellidæ*," Q. J. Micr. Sc. xii. pp. 393 & 394.

Noctiluca.

Allman, G. J. Notes on *Noctiluca*. Q. J. Micr. Sc. xii. pp. 327–334, pl. 18.

The most perfect account hitherto given of this organization, which "consists essentially of an enormous vacuolated protoplasm, involving a nucleus and enclosed in a structureless sac, which is provided with an inferent, and probably also with an efferent opening; the vacuolation takes place to such an extent as to separate the contents into a peripheral layer of protoplasm, which remains adherent to the outer sac, and a central mass kept in communication with the peripheral layer by processes of protoplasm, which pass from one to the other in the form of a meshwork of branched and intercommunicating filaments." In these threads of protoplasm only feeble cyclotic movements could be traced by means of the refringent corpuscles. The "nucleus" is not contractile. At the bottom of the spacious "atrium" is the base of the flagellum and the gullet-shaped mouth, with its interior filament &c. The peripheral layer, in which the luminosity has its special seat, is studded with nucleated cells, to which the origin of the "zoospores" might be attributed. *Noctiluca* is most nearly related to *Peridinium*, Ehrnbg., and especially to an allied organism described by Allman in 1855.

L. Cienkowski describes shortly (Z. wiss. Zool. xxii. pp. 297 & 298; Q. J. Micr. Sc. xii. p. 414) the development of the "zoospores." They originate as numerous small elevations, forming together a shield of varied shape and size on the body, which, previously to the budding of the "swarm-spores," has lost funnel, mouth, nucleus, and flagellum, and is almost without any definite contents. Copulation is not an absolutely necessary introduction to this gemmiparous propagation, which is preceded by a division of the protoplasm into 2, 4, 8, 16 portions. The author agrees with Allman in regarding *Noctiluca* as a gigantic Flagellate.

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