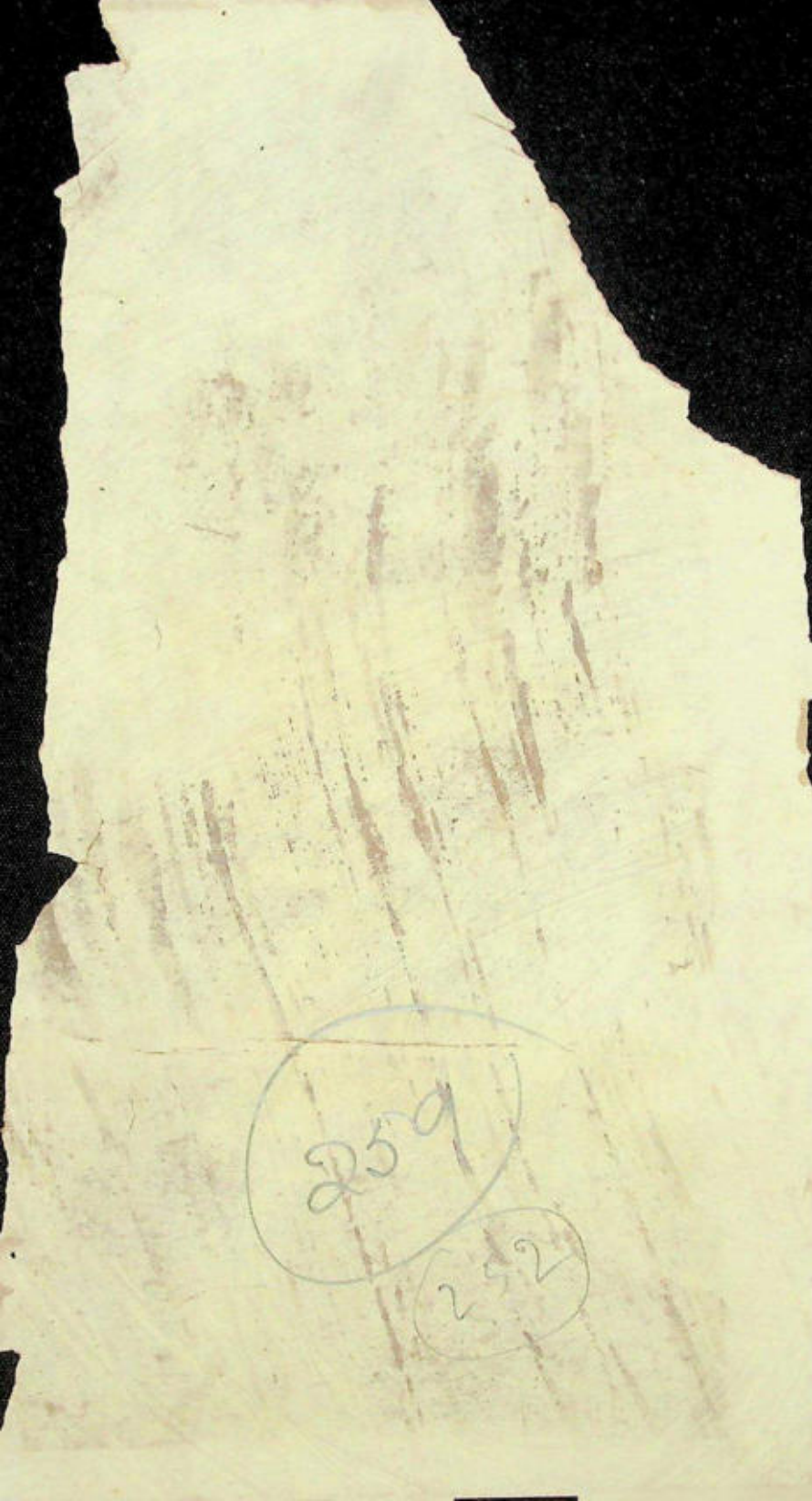



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EDITED BY

F. JEFFREY BELL, M.A., SEC. R.M.S.,

PROFESSOR OF COMPARATIVE ANATOMY AND ZOOLOGY IN KING'S COLLEGE, LONDON.

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Zoological Record Association

(FOUNDED 11 JANUARY, 1871;

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

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

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

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

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

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

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

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PREFACE.

I have been fortunate in securing the services of Professor Bertkau as Recorder of the *Arachnida*, and he has supplied the information regarding the genera and species described in 1883 and 1884, which was wanting in the last two volumes.

Numerous corrections and additions have been made in the list of works consulted.

Owing to the efforts of the Recorders, the present volume appears at an earlier date than usual. I have to return their thanks and my own to those institutions and individuals who have favoured us with copies of their publications.

The Association is grateful for grants of £100 from the Government Grant Fund and the British Association, and for one of £10 from the Royal Irish Academy.

F. JEFFREY BELL.

London,
26th November, 1886.

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Bull. Sci. Nord—Bulletin scientifique, historique, et littéraire du Départemente du Nord et des pays voisins (Giard: Paris).

Bull. Sedalia Soc.—Bulletin of the Sedalia Natural History Society (Sedalia, Mo.).

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

P. R. Soc. Vict.—Proceedings of the Royal Society of Victoria (Melbourne).

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

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

Publ. Inst. Luxemb.—Publications de l'Institut royal grand-ducal de Luxembourg.

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

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

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

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

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

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

Rad jugoslav. akad.—Rad jugoslavenske akademije znanosti i umjetnosti (Zagreb). [Transactions of the South Slav Academy of Science and Art.]

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

Rec. Vénus—Recueil de Mémoires, Rapports et Documents relatifs à l'observation de Passage de Vénus sur le Soleil (Paris).

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

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

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

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

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

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

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

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

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

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

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

Rep. N. Y. Mus.—Annual Report on the New York State Museum of Natural History (Albany).

Rep. Penzance Soc.—Report and Transactions of the Penzance Natural History and Antiquarian Society.

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

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

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

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

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

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

Rev. Cien. Madrid—Revista de los progresos de las Ciencias exactas, fisicas, y naturales (Madrid).

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

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

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

Rev. Quest. sci.—Revue des Questions scientifiques (Brussels).

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

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

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

Rev. Tierheilkunde—Revue für Tierheilkunde und Tierzucht (Vienna).

Rov. Lapok—Rovartani Lapok [Entomological Leaves] (G. Horváth: Budapest).

Rozpraw Wydz. matem.-przyr. Akad. Umiej.—Rozpraw i Sprawozdania z posiedzen Wydzialu matem.-przyr. Akademii Umiejetnosci. (Abhandlungen und Sitzungsberichte der mathem.-naturw. Classe der Akademie der Wissenschaften in Krakau.)

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

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

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

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

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

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

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

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

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

SB. Ges. Morph.—Sitzungsberichte der Gesellschaft für Morphologie und Physiologie in München (Munich).

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

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

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

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

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

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

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

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

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

Schr. Nat. Ver. Schleswig—Schriften der naturwissenschaftlichen Vereins für Schleswig-Holstein (Kiel).

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

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

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

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

S. E. Z.—Stettiner entomologische Zeitung (Dohrn : Stettin).
Smiths. Contrib. Knowledge—Contributions to Knowledge by the Smithsonian Institution (Washington).
Smiths. Misc. Coll.—Smithsonian Miscellaneous Collections (Washington).
Sprawozd. Kom. fizyjogr.—Sprawozdanie Komisyi fizyjograficznéj, &c. (Cracow).
Stud. Biol. Lab. J. Hopkins Univ.—Studies at the Biological Laboratory of the John Hopkins University (Baltimore).
Stud. Micr. Sci.—Studies in Microscopical Science (Cole : London).
Sv. Ak. Handl.—K. Svenska Vetenskaps-Akademiens Handlingar (Stockholm).

Tag. Deut. Nat. Vers.—Tageblatt der Versammlung deutscher Naturforscher und Aertzte.
Term. füzetek—Természetrajzi füzetek : áz allat-, növény-, ásvány-, és földtan Köréből [= Naturhistorische Hefte : Vierteljahrsschrift für Zoologie, Botanik, Mineralogie, und Geologie] (Pesth).
Tijdschr. Ent.—Tijdschrift voor Entomologie (The Hague).
Tijdschr. Nederl. Dierk. Ver. (2)—Tijdschrift van de Nederlandsche Dierkundige Vereeniging (The Hague & Rotterdam).
Tijdschr. Nederl. Ind.—Naturkundig Tijdschrift voor Nederlandsch Indië (Batavia).
Timehri—Timehri : being the Journal of the Royal Agricultural and Commercial Society of British Guiana (Im Thurm : Demerara).
Tr. Am. Ent. Soc.—Transactions of the American Entomological Society (Philadelphia).
Tr. A. S. Japan—Transactions of the Asiatic Society of Japan (Yokohama).
Trav. Ac. Rheims—(Publication des) Travaux de l'Académie des Sciences, Belles-lettres, et Arts, Rheims.
Trav. Lab. Histol.—Travaux du Laboratoire d'Histologie du Collège de France, École pratique des Hautes Études (Ranvier : Paris).
Tr. Conn. Ac.—Transactions of the Connecticut Academy of Sciences (New Haven).
Tr. Devon. Ass.—Report and Transactions of the Devonshire Association for the Advancement of Science, &c. (Plymouth).
Tr. Edinb. Nat. Club—Transactions of the Edinburgh Naturalists' Field Club.
Tr. Ess. Club—Transactions, Journal, and Proceedings of the Essex Field Club (Buckhurst Hill).
Tr. E. Soc.—Transactions of the Entomological Society of London.
Tr. Hertf. Soc.—Transactions of the Hertfordshire Natural History Society and Field Club (Watford).
Tr. Kansas Ac.—Transactions of the Kansas Academy of Science (Topeka).
Tr. L. S. (2)—Transactions of the Linnean Society, London. Second series.
Tr. L. S. New York—Transactions of the Linnean Society of New York.
Tr. North. Durh.—Natural-History Transactions of Northumberland and Durham (Newcastle-on-Tyne).

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

Tr. N. Z. Inst.—Transactions and Proceedings of the New Zealand Institute (Wellington).

Tromsö Mus. Aarsh.—Tromsö Museum's Aarshefter.

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

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

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

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

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

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

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

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

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

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

Unters. Nat.—Untersuchungen zur Naturlehre des Menschen und der Thiere (Moleschott : Giessen).

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

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

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

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

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

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

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

Verh. Ver. Heidelb.—Verhandlungen des naturhistorisch-medicinischen Vereins zu Heidelberg.

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

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

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

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

Viert. Ges. Zürich—Vierteljahrschrift des naturforschenden Gesellschaft zu Zürich.

Wiedomosci z nauk przyrod. = Materialen zu dem Wissenschaften (Warsaw).
Wien. ent. Z.—Wiener entomologische Zeitschrift (Vienna).
Wilt. Mag.—The Wiltshire Archæological and Natural History Magazine (Devizes).
Wszechswiat—Wszechswiat: Tygodnik popularny poswiecony naukom przyrod niezyne [Die Welt: Eine populäre naturhistorische Wochenschrift] (Warsaw).

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

Zapiski Novoross. Obsch. Estestev. = *Mém. Soc. Nouv. Russ.*
Z. Ent. Bresl.—Zeitschrift für Entomologie (Breslau).
Z. f. Ethnol.—Zeitschrift für Ethnologie (Bastian & Hartmann: Berlin).
Z. f. Thiermed.—Zeitschrift für Thiermedicin und vergleichende Pathologie.
Z. geol. Ges. — Zeitschrift der deutschen geologischen Gesellschaft (Berlin).
Z. ges. Orn.—Zeitschrift für die gesammte Ornithologie (Von Madarász: Budapest).
Z. Naturw.—Zeitschrift für Naturwissenschaften. Original Abhandlungen und Berichte herausgegeben im Auftrage der naturwissenschaftlichen Vereins für Sachsen und Thüringen (Brass: Halle-a.-S.).
Zool. (3)—The Zoologist. Third series (Harting: London).
Zool. Anz.—Zoologischer Anzeiger (Carus: Leipzig).
Zool. Beitr.—Zoologische Beiträge (Schneider: Breslau).
Zool. Gart.—Der Zoologische Garten (Wienland, Bruch, & Noll: Frankfort).
Zool. JB.—Zoologischer Jahresbericht (Mayer & Giesbrecht: Leipzig).
Zool. Rec.—The Zoological Record (Bell: London).
Z. wiss. Geogr.—Zeitschrift für wissenschaftliche Geographie (Kettler: Lahr, in Baden).
Z. wiss. Mikr.—Zeitschrift für wissenschaftliche Mikroscopie und für mikroscopische Technik (Behrens: Braunschweig).
Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie (Kölliker & Ehlers: Leipzig).

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CORRIGENDA.

Aves.

For "Nat." read "Naturalist."

Transfer *Caccabis*, *Colinus*, and *Coturnix*, p. 56, to p. 57, under *Phasianidæ*.

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ZOOLOGICAL RECORD

FOR 1885.

MAMMALIA.

BY

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

I.—INTRODUCTION.

There has been no event in the history of Mammals during the year 1885 comparable to the discovery of the eggs of *Ornithorhynchus* in 1884. This discovery, however, has awakened considerable interest in the Class *Monotremata*, so that there are now to be recorded no less than fourteen papers relating to the two known forms of this Class—*Ornithorhynchus* and *Echidna*.

Albrecht has published many interesting and highly original papers on various points in Mammalian morphology, on the subject of hare-lip and its significance (6), and on the question of the generally accepted homology of the swim-bladder of Osseous Fishes with the lungs of higher Vertebrates (7).

Bardeleben and Baur (14–17, 20–26) have contributed considerably by numerous essays to our knowledge of the carpus and tarsus and their c mponent bones.

Trouessart (320) has published another part of his catalogue of Mammals, containing a complete list of all the species of *Creodonta* and Fissiped *Carnivora*; and Thomas (312) has put together all that is known of the different forms of *Echidnidæ*, and reduced the number of species to two.

But it is in Palæontology that the greatest activity has been shown during the past year. Much work has been done and many new species have been described by Lydekker, in Europe; by Cope, in North America; and by Ameghino, in South America.

The new genera of Mammals characterized in 1885 were 26 —a large increase on those of 1884, which were only 15. Of the 24 are fossil and 2 (*Bifa*, a genus of Rodents, and *Megaloglossus*, a genus of Bats) are recent. The new species described were 113, as compared with 103 in 1884, of which 27 were recent and 86 fossil; besides which, 5 recent and 2 extinct forms have been designated as subspecies.

II.—LIST OF PUBLICATIONS, WITH SHORT NOTICES.

1. Albini, G. Sulla tunica muscolare dell' intestino tenue nel cane. Rend. Acc. Nap. xxiv. pp. 309.

2. Albrecht, P. Ueber die im Laufe der phylogenetischen Entwickelung entstandene, angeborene Spalte des Brustbein-hand-griffes der Brüllaffen. SB. Ak. Berlin, 1885, pp. 337–353.

On the splitting of the manubrium in *Mycetes ursinus* and *M. seniculus*, and on the meaning of it. The author attributes it to the great development of the hyoid in this genus.

3. ——. Ueber Existenz oder Nichtexistenz der Rathke'schen Tasche. Biol. Centralbl. iv. pp. 724–726.

Discussion as to the interpretation of a preparation of the dog-embryo figured in Kölliker's Entwicklungsgeschichte, as to whether a certain invagination of the ectoderm is the commencement of the hypophysis cerebri or not.

4. ——. Ueber die Chorda dorsalis und 7 knöcherne Wirbelzentren im knorpligen Nasenseptum eines erwachsenen Rindes. *Op. cit.* v. pp. 144–159 & 187–189.

This is an answer to a paper by Kölliker (167). The object of the article is to prove the presence of the notochord with no less than seven ossifications in it in the nasal septum of embryonic Mammals.

5. ——. Ueber die Wirbelkörperepiphysen und Wirbelkörpergelenke zwischen dem Epistropheus, Atlas und Occipitale der Säugethiere. Abd. aus Comptes Rendus der achten Sitzung des internationalen medicinischen Kongresses (Kopenhagen : 1884).

Description of the epiphyses between the skull and the first two vertebræ, showing how epiphyses originally consist of three parts—a median and two lateral pieces.

6. ——. Zur Zwischenkeiferfrage. Abd. aus Fortschritte der Medicin, iii. p. 443 (Berlin : 1885).

An answer to a paper by Prof. Stöhr, on the subject of hare-lip and its meaning. The author considers the upper lip to be made up of two paired and one unpaired part—the interlabia externa and interna and the supralabium. Hare-lip may result from the non-closure of the canals between either of these pieces of which the upper lip is made up.

167. [MEISTER, H.] [BRECHT, P.] Ueber die morphologische Bedeutung der Pharynxdivertikel. Sep. Abd. Centralbl. für Chirurgie, 1885, No. 24.

The author believes that the swim-bladder of Osseous Fish is not homologous with the Amniote lungs, as is generally held, but that the swim-bladder is homologous with a certain dorsal diverticulum of the pharynx which is found to be constant in the Pig, Camel, and Elephant.

8. *——. Ueber den morphologischen Werth des Unterkiefergelenkes, der Gehörknöchelchen, und des mittleren und ausseren Ohres der Säugethiere, pp. 1–8, pl. viii. Basel: 1885, 8vo. [*Cf.* Zool. Anz. viii. p. 733.]

9. ALLEN, H. The Shape of the Hind-Limb in the *Mammalia*, as Modified by the Weight of the Trunk. P. Ac. Philad. 1885, pp. 383 & 384.

10. ALLEN, J. A. On an Extinct Type of Dog. Mem. Mus. C. Z. x. No. 2, pp. 1–13, pls. i.–iii.

Description of *Pachycyon robustus*, a new genus and species of *Canidæ* from Ely Cave, Virginia; the age is probably early Pliocene.

11. AMANS, P. C. Comparaisons des organes du vol dans la série animale. Ann. Sci. Nat. (6) xix. Art. 2. [Bats, pp. 186–195.]

12. AMEGHINO, F. Nuevos restos de Mamíferos fósiles oligocenos. Bol. Ac. Arg. viii. pp. 1–207.

Description of a large collection of Mammalian remains from deposits considered by the author to be contemporaneous with the Oligocene of Europe. 15 new genera and 36 new species belonging to various orders are described. [*Cf.* Am. Nat. xix. p. 789.]

13. ANDERSON, R. J. Note on the Peritoneum of the Seal. J. Anat. Phys. xix. pp. 228 & 229.

13A. BALFOUR, F. M. [See FOSTER & SEDGWICK (119B).]

14. BARDELEBEN, K. Untersuchungen zur vergleichenden Anatomie und Entwickelungsgeschichte von Hand und Fuss der Säugethiere und des Menschen. SB. nat. Fr. 1885, pp. 156–158.

15. ——. Zur Entwickelung der Fusswurzel. SB. Jen. Ges. (Jen. Z. Nat. xix.) pp. 27–32.

On a new tarsal bone in the human embryo, and on a sixth toe in Marsupials.

16. ——. Zur Morphologie des Hand- und Fuss-skelets. *T. c.* pp. 84–88.

The most noticeable point is the discovery of a sixth finger and toe in many embryonic Mammals; the sixth digit is situated on the tibial or radial side, and so may be described as a præhallux.

17. ——. Ueber neue Bestandtheile der Hand- u. Fusswurzel der Säugethiere, so wie die normale Anlage überzähliger Finger und Zehen bei Menschen. *T. c.* pp. 149–164.

In the hand no less than seven proximal elements are distinguished, and rudiments of a præpollex in the hand and a præhallux in the foot have been found even in man.

18. Bartels, M. Ueber Skelet-resten von *Cervus euryceros*. Fr. 1885. p. 103.

19. Bartlett, A. D. On a Female Chimpanzee now living in the Society's Gardens. P. Z. S. 1885, pp. 673–675, pl. xli.

This Chimpanzee differs considerably from the normal form of Chimpanzee, in the baldness of its head and form of its ears; the author believes it to be *Troglodytes calvus*.

20. Baur, G. Das Trapezium der Cameliden. Morph. JB. xi. pp. 117 & 118.

The author asserts that he has found a small trapezium in *Camelus bactrianus*, the camels being hitherto supposed to possess no trapezium.

21. ——. Bemerkungen über den "Astragalus" und das "Intermedium tarsi" der Säugethiere. *T. c.* pp. 468–483, pl. xxvii.

The author deals with the homologies of a small mass of cartilage found only in Marsupials between the astragalus and calcaneum; the author fails to draw any definite conclusions from his observations.

22. ——. Zur Morphologie des Carpus und Tarsus der Wirbelthiere. Zool. Anz. viii. pp. 326–329 & 486–488.

23. ——. On the Morphology of the Tarsus in the Mammals. Am. Nat. xix. pp. 86–88.

24. ——. On the Centrale Carpi of Mammals. *T. c.* pp. 195 & 196.

25. ——. The Trapezium of the *Camelidæ*. *T. c.* pp. 196 & 197.

26. ——. On the Morphology of Carpus and Tarsus of Vertebrates. *T. c.* pp. 718–720.

Gives a complete table of homologies as derived from embryological and literary studies.

27. Beddard, F. E. Remarks on the Ovary of *Echidna*. P. Phys. Soc. Edinb. viii. pp. 354–362, pls. xvi. & xvii.

On the histological structure of the ovary and ovarian ovum of *Echidna*; the latter is found to resemble, in all essential respects, the ovarian ovum of *Ornithorhynchus*, as described by Poulton [*cf.* Zool. Rec. xxi. *Mamm.* p. 25].

27a. ——. The Collected Scientific Papers of the late William Alexander Forbes, M.A. London: 1885, 8vo, xiii. and 496 pp., 25 pls., and portrait.

28. Behrens, H. Die Fortpflanzung der Schnabeltiere. Biol. Centralbl. v. pp. 75–78.

29. Bell, F. J. Comparative Anatomy and Physiology. London: 1885, 8vo, 555 pp., 229 engravings.

A text book of comparative anatomy and physiology. The first three chapters contain a general introduction; the following chapters contain an account of various organs throughout the animal series.

167. [REISTER, H.] Fossils. Del fuso divezionale e della formazione di un globulo polare nell' ovulo ovarico di alcuni Mammiferi. Atti Acc. Rom. (Rendic.) (4) i. pp. 285 & 286.

31. ——. Sulla terminazione centrale del nervo ottico nei Mammiferi. Mem. Acc. Bologn. (4) vi. pp. 199–204, 1 pl.

On the proximal termination of the optic nerve in *Mus musculus*.

32. ——. Intorno al modo di genesi di un globulo polare nell' ovulo ovarico di alcuni Mammiferi (Topolino, Cavia, Coniglio). *T. c.* pp. 363–367, 1 pl.

On the formation of polar bodies and the early stages of segmentation in certain Mammals.

33. Beneden, P. J. Un mot sur les deux Balénoptères d'Ostende de 1827 et de 1885. Bull. Ac. Belg. (3) ix. pp. 145–151.

34. ——. Sur l'apparition d'une petite gamme de vraies Baleines sur les côtes est des États-Unis d'Amérique. *T. c.* pp. 212–214.

35. ——. Sur la Baleine pêchée le 15 Mai, 1885, par le bateau 'Le Gaulois' de Fécamp. *Op. cit.* x. p. 582.

On a Whale supposed by M. G. Lennier, in La Nature, 15 May, 1885, to be *Balæna musculus*. M. van Beneden considers it to be *Balænoptera rostrata*, Fabr.

36. ——. Description des Ossements fossiles des Environs d'Anvers. Ann. Mus. Belg. ix. pt. 4, pp. 1–40.

On fossil *Cetacea* of the genus *Plesiocetus*, with descriptions of new species. [See *Cetacea*.]

37 Biddulph, J. On the Geographical Races of the Rocky Mountain Bighorn. P. Z. S. 1885, pp. 678–684.

Shows that there are two distinct races of *Ovis canadensis*, the Bighorn Sheep—a northern and a southern.

38. Biondi, D. Die Entwicklung der Spermatozoiden. Arch. mikr. Anat. xxv. pp. 594–620.

39. Blanford, W. T. Exhibition and Description of a Skull of an apparently New Species of *Paradoxurus* (*Paradoxurus jerdoni*). P. Z. S. 1885, pp. 612 & 613.

40. ——. A Monograph of the Genus *Paradoxurus*, F. Cuv. *T. c.* pp. 780–808, pls. xlix. & l.

A complete systematic account of the genus *Paradoxurus* is given. An examination of the literature shows that no less than 49 specific terms have been applied to various members of the group; after deducting names applied to forms now considered to belong to other genera, 40 specific names are left: these Mr. Blanford refers to 11 species, the names of which will be found in the second part. [*Cf. Carnivora*.]

41. *Bolau, H. Ueber die wichtigsten Wale des Atlantischen Ozeans und ihre Verbreitung im demselben. Aus Segelhandb. f. d. Atlant. Ozean, cap. 14, 13 pp. [*Cf.* Zool. Anz. viii. p. 520.]

42. Bonnet, R. Haarspiralen und Haarspindeln. [illegible] pp. 220–228, pl. xiii.

On the curls of hair in the follicle by means of which are produced the curls in the adult hair.

43. *Bonnier, P. L'orientation auditive. Bull. Sci. Nord, 1884–85, pp. 11–29.

44. Boveri, T. Beiträge zur Kenntniss der Nervenfasern. Abh. bayer. Ak. xv. pp. 421–495, pls. i. & ii.

Histological paper on nerve fibres.

45. Brauns, D. Fernere Bemerkungen über den japanischen Nörz. Jen. Z. Nat. xviii. pp. 666–676.

Shows that *Mustela itatsi* cannot be separated from *M. lutreola* by any constant characters.

46. Bronn, H. G. Klassen und Ordnungen des Thier-Reichs. vi. Säugethiere. Fortgesetzt von Dr. W. Leche in Stockholm. Leipzig und Heidelberg : 1885, 8vo, pp. 593–624, pl. xciv.

Part 28 contains an account of the osteology of the Mammalian crus and pes.

47. Brown, H. H. Spermatogenesis in the Rat. Q. J. Micr. Sci. xxv. pp. 343–369, pls. xxii. & xxiii.

48. Browne, M. Notes on the Vertebrate Animals of Leicestershire. Zool. (3) ix. pp. 161–169, 214–220, & 248–253.

The author enumerates 40 species of Mammals, including forms extinct since Tertiary times, as inhabiting Leicestershire.

49. Buckley, T. E. A Few Notes on the Mammals and Birds of Rousay, one of the Orkney Islands. Tr. N. H. Soc. Glasg. (n.s.) i. pp. 44–76.

Ten Mammals are recorded. The chief point to be noticed is the entire absence of Rats; the commonest Mammal is the Field Vole (*Arvicola agrestis*).

50. Bunge, A. Bericht über fernere Fahrten im Lena-Delta und die Ausgrabung eines angeblich vollständigen Mammuthcadavers. Bull. Pétersb. xxx. pp. 228–282.

Account of a journey in search of Mammoth remains in Siberia.

51. Burmeister, H. Neue Beobachtungen an *Macrauchenia patachonica*. Nova Acta Ac. L.-C. Nat. cur. xlvii. pp. 239–267, pls. xxii. & xxiii.

On the limb skeleton and dentition of *M. patachonica*.

52. ——. Berichtigung zu *Cælodon*. SB. Ak. Berlin, 1885, pp. 567–573, pl. v.

Additional description of this genus of Edentates from new material.

53. ——. Ueber den Schädel von *Canis jubatus*. SB. nat. Fr. 1885, pp. 97–103.

167. [BURMEISTER, H.] Exámen crítico de los Mamíferos y Reptiles fósiles denominados por D. Augusto Bravard. An. Mus. B. Aires, iii. pp. 95–174; pls. ii. & iii.

Contains further accounts of certain species of fossil Mammals which were described in various places by M. Bravard, who perished in the great earthquake of Mendoza.

55. BUTLER, A. B. Observations on the Musk Rat. Am. Nat. xix. pp. 1044–1055.

56. CALDWELL, W. H. On the Development of the Monotremes and *Ceratodus*. P. R. Soc. N. S. W. xviii. pp. 117–122.

Abstract of an address by Mr. Caldwell to the members of the Royal Society, N. S. W., on his embryological researches.

57. CAMERANO, L. Ueber die *Talpa europæa*, Linn., und die *Talpa cæca*, Savi. Zool. Anz. viii. pp. 295 & 296.

Shows that *Talpa cæca* is really the same as *T. europæa*, and that the latter is therefore the only species of Mole found in Europe.

58. *——. Ricerche intorno alle Specie italiane del genere *Talpa*. Torino: 1885, 4to, pp. 25. [Estr. della Mem. Acc. Tor. (2) xxxvii.]

59. CAPELLINI, G. Resti fossili di *Dioplodon* e *Mesoplodon*. Mem. Acc. Bologn. (4) vi. pp. 291–306, 1 pl.

Descriptions of new species.

60. ——. Resti fossili di *Dioplodon* e *Mesoplodon* raccolti nel Terziario superiore in Italia. Atti Acc. Rom. (Rendic.) (4) i. pp. 171–173.

61. CARRIÈRE, J. Die Sehorgane der Thiere. München und Leipzig: 1885, 8vo, 205 pp., 1 pl.

Account of Mammalian eye, pp. 69–87.

62. CATON, J. D. The Male Deer in Domestication. Am. Nat. xix. pp. 811 & 812.

63. CHIEVITZ, J. H. Beiträge zur Entwickelungsgeschichte der Speicheldrusen. Arch. Anat. Phys. (Anat.) 1885, pp. 400–436, pl. xix.

64. CIACCIO, G. V. Osservazioni anatomiche comparative intorno agli occhi della *Talpa illuminata* (*Talpa europæa*, L.) a quelli della *Talpa cieca* (*Talpa cæca*, S.). Mem. Acc. Bologn. (4) vi. pp. 31–41, 1 pl.

On the power of sight of the Mole.

65. CLAUS, C. Lehrbuch der Zoologie. 3tte Aufl. Marburg: 1885, 8vo.

Mammals, pp. 737–812. Nine additional pages are devoted to the Mammals, and several new woodcuts are given, among which there is a specially good diagram of the human ear.

66. COCKS, A. H. Additional Notes on the Finwhale Fishery on the North European coast. Zool. (3) ix. pp. 134–143.

67. COLLETT, R. On *Echidna acanthion* from Northern Queensland. P. Z. S. 1885, pp. 148–161.

On a new species of *Echidna* first described in Forh. Selsk. Chr. 1884, from North Queensland.

68. Conwentz, —. Die einheimische Wirbelthier-Fauna. [illegible] Danz. (2) vi. pp. 6–11.

Vertebrate fauna of the neighbourhood of Danzic.

69. Cope, E. D. On the Contents of a Bone Cave in the Island of Anguilla (West Indies). Smiths. Contrib. Knowledge, xxv. No. 3, 30 pp., pls. i.–v.

Description of 3 species of *Amblyrhiza*, an extinct genus of large Rodents; and also of remains of an Artiodactyle, probably a member of the *Bovidæ*.

70. ——. The Extinct *Mammalia* of the Valley of Mexico. P. Am. Phil. Soc. xxii. p. 1–21.

Description of new genera and species of fossil *Mammalia* from the neighbourhood of the city of Mexico. [*Cf. Elephantidæ, Equidæ, Camelidæ.*] The genus *Mastodon* is split up into 3 new generic groups: *Mastodon, Dibelodon,* and *Tetrabelodon.*

71. ——. On the Structure of the Feet in the Extinct *Artiodactyla* of North America. *T. c.* pp. 21–27.

Contains a precise account of the structure of the tarsus of several genera of Bunodont and Selenodont *Artiodactyla*, among others of *Pantolestes*. Observations on phylogeny follow, in which the whole Artiodactyle phylum is derived from *Pantolestes.*

72. ——. The *Amblypoda*. Am. Nat. xix. pp. 40–55, pl. i. [continued from p. 1202, vol. xviii.].

Contains an account of the *Dinocerata*, the last sub-order of the *Amblypoda*. [*Cf.* Zool. Rec. xxi. *Mamm.* p. 9].

73. ——. On the Evolution of the *Vertebrata*, Progressive and Retrogressive. *T. c.* pp. 140–148, 234–247, & 341–353.

The Mammals are treated of, p. 346; a table of the classification used is given. The following are the names of the 14 orders recognized by the author: 1, *Monotremata*; 2, *Marsupialia*; 3, *Cetacea*; 4, *Sirenia*; 5, *Taxeopoda*, containing 5 sub-orders—(*a*) *Condylarthra*, (*b*) *Hyracoidea*, (*c*) *Daubentonoidea*, (*d*) *Quadrumana*, and (*e*) *Anthropoidea*; 6, *Proboscidea*; 7, *Amblypoda*; 8, *Diplarthra*, including *Perissodactyla* and *Artiodactyla*; 9, *Edentata*; 10, *Rodentia*; 11, *Chiroptera*; 12, *Bunotheria*; 13, *Carnivora*. The order that explains the phylogeny of most of the Mammalian groups is the *Condylarthra*. The author then shows the progressive modifications of Mammals in the several points, such as the feet and digits, the vertebræ, and the dentition.

74. ——. The White River Beds of Swift Current River, North-West Territory. *T. c.* p. 163.

Identification of a number of Mammalian skeletons from the above locality; the most interesting is *Hemipsalodon grandis*, g. & sp. nn. of the family *Oxyænidæ*, and the first of the family found above the Bridger Eocene.

75. ——. The Oldest Tertiary *Mammalia*. *T. c.* pp. 385–387.

Description of new species of Mammals from the lowest horizon of the Puerco epoch of New Mexico.

167. KÜHNE, E. D.] The *Lemuroidea* and the *Insectivora* of the Eocene Period of North America. Am. Nat. xix. pp. 457–471.

The author first shows the impossibility of distinguishing the Lemuroid and Insectivorous forms where the foot-structure is unknown; he then discusses the three families *Adapidæ*, *Mixodectidæ*, and *Anaptomorphidæ*, with their component genera.

77. ——. The Mammalian Genus *Hemiganus*. *T. c.* pp. 492 & 493.

On the genus generally, with description of a new species. [See *Creodonta*.]

78. ——. Marsupials from the Lower Eocene of New Mexico. *T. c.* pp. 493 & 494. [*Cf. Polymastodontidæ* and *Plagiaulacidæ*.]

79. ——. The Genera of the *Dinocerata*. *T. c.* p. 594.

Notes on the names of the genera of the *Dinocerata* used by the author, as opposed to those of Marsh.

80. ——. Pliocene Horses of South-Western Texas. *T. c.* pp. 1208 & 1209, pl. xxxvii.

Description of fossil horses from Texas, with illustrations of the molars of *Equus crenidens*.

81. ——. Mr. Lydekker on *Esthonyx*. Geol. Mag. (3) ii. pp. 526 & 527.

An answer to Lydekker's identification of *Esthonyx*, Cope, with *Platychœrops*, Charlesworth.

82. ——, & WORTMAN, J. L. The Post-Pliocene Vertebrates of Indiana. 14th Annual Report of the State Geologist. Indiana: 1884. Part II. pp. 1–41.

General account of the Post-Pliocene Mammals of Indiana, illustrated by six plates.

83. *CORNELI, R. Der Fischotter. Berlin: 1885, 8vo, 148 pp.

84. CUNNINGHAM, J. D. The Structure and Development of the Suspensory Ligament of the Fetlock in the Horse, Ox, &c. Am. Nat. xix. pp. 127 & 128.

85. DAWKINS, W. BOYD. Contributions to the History of the Pleiocene and Pleistocene Deer. Part I. *Cervus verticornis*, *Cervus savini*. P. R. Soc. xxxviii. p. 345.

86. ——. On a Skull of *Ovibos moschatus* from the Sea-Bottom. Q. J. G. Soc. xli. pp. 242–244.

The specimen was probably derived from the Forest-bed.

87. DEBIERRE, C. Sur l'appareil hyoidien considéré dans la série des Vertébrés. Bull. Soc. Z. Fr. x. pp. 487–546.

The hyoid bone, with its ligaments and muscles, is described in detail in the various classes of Vertebrates. The author then discusses the various theories as to the homologies of the Mammalian ear-bones; he agrees with the generally accepted views of Huxley and Balfour.

88. DELAGE, Y. Structure et accroissement des fanons des Baléno-ptères. C.R. ci. pp. 86–89.

On the histological structure of the baleen plates of the Baleen Whale.

89. Deniker, J. Sur un fœtus de Gibbon et son placenta. pp. 654–656.

90. Depéret, C. Description géologique du bassin tertiaire du Roussillon. Ann. Sci. géol. xvii. pp. 1–272.

At p. 136 will be found full descriptions of fossil *Mammalia* found at Roussillon, among which is 1 new species. [See *Viverridæ*.]

91. ——, & Révolle, L. Note sur la géologie et sur les Mammifères fossiles du bassin lacustre miocène supérieur de la Cerdagne. Bull. Soc. géol. (3) xiii. pp. 488–506.

Notes on some fossil Mammals (pp. 496-505); no new species are described.

92. Dobson, G. E. Remarks on the Skull of *Crocidura aranea*. P. Z. S. 1885, p. 324.

One of the skulls possessed a supernumerary premolar on each side of the upper jaw, as in the species of the closely allied subgenus *Pachyura*.

93. ——. Notes on Species of *Chiroptera* in the collection of the Genoa Civic Museum, with descriptions of new species. Ann. Mus. Genov. (2) ii. pp. 16–19.

Description of 2 new species of Bats. [See *Chiroptera*.]

94. ——. An Attempt to Exhibit diagrammatically the several stages of Evolution of the *Mammalia*. Rep. Brit. Ass. 1884, p. 768, pl. ix.

Contains a diagram constructed on the circular principle, showing the evolution of the various Orders of Mammals from the *Hypotheria* or hypothetical ancestors of Mammals.

95. Düsing, C. Die Experimentelle Prüfung der Theorie von der Regulierung des Geschlechtsverhältnisses. SB. Jen. Ges. (Jen. Z. Nat. xix.) p. 108–112.

On some experiments on Guinea-pigs and White Mice with regard to sex. When fewer males are put with many females, more females are produced, and *vice versâ*.

96. *Edinger, L. Zehn Vorlesungen über den Bau der nervösen Zentralorgane. Leipzig: 1885.

97. Elliott, H. W. The Destruction of Carp by the Musk Rat (*Fiber zebethicus*). Bull. U. S. Fish. Comm. iv. pp. 296 & 297.

Shows that the Musk Rat is a fish eater, and does not confine itself to a vegetable diet.

98. Emery, C. Ricerche embriologiche sul rene dei Mammiferi. Atti Acc. Rom. Mem. (3) xv. pp. 411–420, 1 pl.

99. English, J. L. A Note on the Occurrence of the Marten (*Martes foina*) in Epping Forest. Tr. Ess. Club, iv. p. lxiv.

100. Familiant, V. Beiträge zur Vergleichung der Hirnfurchen bei den Carnivoren und den Primaten. MT. Ges. Bern, 1885, ii. pp. 49–81, pls. i. & ii.

Study of the brain convolutions of a Lion.

167. Kölliker, A. Contribution à l'étude du nerf auditif. Bull. Soc. V. Fr. x. pp. 208–242, pl. ii.

102. Ficalbi, E. Di una particolare disposizione di alcuni vasi venosi del collo nelle Scimurie. Atti Soc. Tosc. iv. pp. 400–410, 1 pl.

103. Filhol, H. Description d'un nouveau genre et d'une nouvelle espèce de carnassier fossile. Bull. Soc. Philom. (7) ix. pp. 19–21.

[See *Adracon quercyi*.]

104. ——. Description d'une nouvelle espèce de Suidé fossile appartenant au genre *Hyotherium*. *T. c.* pp. 29–33.

105. ——. Description d'une espèce nouvelle de Pachyderme fossile appartenant au genre *Protapirus*. *T. c.* p. 50.

106. ——. Observations relative au mode de constitution de prémolaires et des molaires de Lemuriens fossiles appartenant au genre *Necrolemur*. *T. c.* pp. 51–53.

Description of the upper molars and premolars of *Necrolemur* from fresh material.

107. ——. Observations sur le mémoire de M. Cope intitulé Relations des horizons renfermant des débris d'animaux vertébrés fossiles en Europe et en Amérique. Ann. Sci. géol. xvii. pp. 1–16.

The author shows that *Anaptomorphus* and *Necrolemur*, *Hyrachius* and *Lophiodon*, are not really so closely allied to one another as has been suggested by Cope.

108. Fischelis, P. Beiträge zur Kenntniss der Entwickelungsgeschichte der Gl. Thyreoidea und Gl. Thymus. Arch. mikr. Anat. xxv. pp. 405–440, pl. xix.

The origin of the thyroid in the Pig embryo is described as very different from that in the Chick.

109. Fischer, P. Sur le squelette du genre fossile *Scelidotherium*. C.R. ci. pp. 1291–1293.

Note on a complete skeleton in the Museum of Natural History at Paris.

110. Flemming, W. Ueber die Bildung von Richtungsfiguren in Säugethiereiern beim Untergang Graaf'scher Follikel. Arch. Anat. Phys. (Anat.) 1885, pp. 221–244, pls. x. & xi.

On the formation of directive or polar bodies in the Mammalian ovarian ovum.

111. Flesch, M. Die untere Halskrummung des Rückenmarkes der Säugethiere. Arch. Anat. Phys. (Anat.) 1885, pp. 102–109, pl. vi.

On the form and the curves of the spinal cord in Mammals.

112. Fletcher, J. J. Catalogue of Papers and Works relating to the Mammalian Orders *Marsupialia* and *Monotremata*. P. Linn. Soc. N. S. W. ix. pp. 809–863.

113. Flower, W. H. An Introduction to the Osteology of the *Mammalia*. 3rd Ed. London: 1885, 8vo, 382 pp.

A new and revised edition. There are a number of fresh illustrations; and many references to the more important recent memoirs on the subjects referred to have been introduced. The author has been assisted in the revision by Dr. Hans Gadow.

114. ——. List of the Specimens of *Cetacea* in the Zoological Department of the British Museum. London: 1885, 8vo, 36 pp.

An almost complete list of all the well-established species of *Cetacea*; the only notable deficiency being *Rhachianectes glaucus*, a whalebone Whale from the Northern Pacific.

115. ——. On a Specimen of a Whale, Rudolphi's Rorqual (*Balænoptera borealis*, Lesson, = *Sibbaldius laticeps*, Gray), lately taken in the River Crouch, Essex. Tr. Ess. Club, iv. pp. 111–115.

Notes on the osteology, distribution, and nomenclature of this species.

116. ——. Otter. Encycl. Brit. xviii. p. 69.

General account of the genera *Lutra* and *Enhydra*.

117. ——. *Platypus*. Encycl. Brit. xix. p. 213.

118. Fol, H. Sur la queue de l'embryon humain. C.R. c. pp. 1469–1472.

The author states that the embryo of the fifth to the sixth week is provided with a definite and incontestible tail.

119. Forbes, H. O. A Naturalist's Wanderings in the Eastern Archipelago. London: 1885, 8vo, 536 pp.

Contains summaries of the scientific results in a series of appendices; on p. 118 is a description of a Bat (*Kerivoula javana*, Thomas).

119a. Forbes, W. A. [See Beddard (27a).]

119b. Foster, M., & Sedgwick, A. The Works of Francis Maitland Balfour, M.A., LL.D., F.R.S. London: 1885, 8vo (4 vols.).

Vol. i. contains original memoirs and the development of the Elasmobranch fishes; vols. ii. and iii., the text-book of comparative embryology; vol. iv., the plates. There is an account of the placenta, i. p. 734; and of the development of Mammals, iii. pp. 217–274.

120. Fraas, —. Beiträge zur Fauna von Steinheim. JH. Ver. Württ. xli. pp. 313–326, pls. iv. & v.

Descriptions of new species of *Amphicyon*, *Trochotherium*, *Hyænictis*, and *Chœropotamus*.

121. Frey, H. Grundzüge der Histologie. 3rd Auf. Leipzig: 1885, 8vo, 309 pp.

Textbook of histology, illustrated by many woodcuts.

122. Froriep, A. Ueber Anlagen von Sinnesorganen am Facialis, Glossopharyngeus und Vagus, über die genetische Stellung des Vagus zum Hypoglossus, und über die Herkunft der Zungenmusculatur. Arch. Anat. Phys. (Anat.) 1885, pp. 1–55, pls. i. & ii.

On the origin and significance of the 7th, 9th, and 10th cranial nerves, and on their relations to certain rudimentary sense-organs, supposed to

167. Köl[illegible] those of the lateral line in fishes; the observations were made [illegible]g-embryos.

123. Fürbringer, M. Ueber die Nervenkanäle im Humerus der Amnioten. Morph. JB. xi. pp. 484–486.

On the homologies of certain foramina for the passage of the radial nerve in the distal end of the humerus in certain *Mammalia*.

124. Gaudry, A. Sur les Hyènes de la grotte de Gargas, découvertes par M. Félix Régnault. CR. c. pp. 325–328.

Note on a complete skeleton of *Hyæna crocuta* var. *spelæa*, found in a cave in the South of France.

125. ——. Sur les Dinocératidés que M. Marsh a recueillis dans l'éocène du Wyoming. *Op. cit.* ci. pp. 718–720.

126. Gegenbaur, C. Ueber das Rudiment einer septalen Nasendrüse beim Menschen. Morph. JB. xi. pp. 486–488.

The nasal gland was discovered by Kölliker, and was supposed to be homologous with the organ of Jacobson; this Gegenbaur thinks is not the case.

127. Geinitz, H. B. Ueber Milchzähne des Mammuth, *Elephas primigenius*. Festschrift Ges. Isis (Dresden) 1885, pp. 66–74, pl. iii.

128. Gervais, H. P. Sur le développement du bassin chez les Cétacés. C.R. ci. pp. 1281 & 1282.

Shows that the ossification of the pelvic girdle of *Cetacea* does not take place till after birth, probably at the age of one year.

129. Gibson, J. L. The Blood-Forming Organs, and Blood Formation. J. Anat. Phys. xx. pp. 100–113.

Investigation on two elements of the blood, called by the author coloured and colourless microcytes respectively; the former are fragments of broken-down red corpuscles, the latter are derived from the nuclei of blood-corpuscles, and especially of nucleated red ones, and are supposed to be the immediate agents of coagulation.

130. Gierke, H. Die Stützsubstanz des Centralnervensystems. Arch. mikr. Anat. xxv. pp. 441–552.

131. Gill, T. The Eggs of *Ornithorhynchus*. Science, iv. pp. 452 & 453.

A letter containing references to ancient descriptions of the eggs of *Ornithorhynchus*.

131a. Goode, G. B. (edited by). The Fisheries and Fishery Industries of the United States. Section I. The Natural History of Useful Aquatic Animals. Washington: 1884, 4to, 2 volumes, text and atlas, pp. 1–895.

This volume contains :—

(*a*) The Whales and Porpoises, by G. Brown Goode, pp. 1–32, pls. i.–xi.

(*b*) The Seals and Walruses, by Joel A. Allen, pp. 33–74, pls. xii.–xxv.

(*c*) The Habits of the Fur Seal, by Henry W. Elliott, pp. pls. xxvi.–xxxii.

(*d*) The Manatees and the Arctic Sea Cow, by F. W. True, pp. 114–136, pls. xxxiii. & xxxiv.

132. Grewingk, C. Neue Funde subfossiler Wirbelthierreste unserer Provinsen. SB. Ges. Dorp. 1885, pp. 143 & 144.

133. Guillemard, F. H. H. Remarks on *Ovis nivicola*. P. Z. S. 1885, pp. 675–678.

Remarks on a series of specimens collected in Kamschatka.

134. Guldberg, C. A. Ueber das Centralnervensystem der Bartenwale. Forh. Selsk. Chr. 1885, pp. 1–154, pls. i.–v.

A complete account of the nervous system of the Whale. The anatomy, the convolution, the weight, and size of the brains of the various members of the *Cetacea* are entered into in detail; the descriptions more particularly refer to *Balænoptera musculus*.

135. ——. Beitrag zur Kenntniss der Eierstockeier bei *Echidna*. SB. Jen. Ges. (Jen. Z. Nat. xix.) pp. 113–122, pl. i.

The author entirely corroborates Poulton's observations on *Ornithorhynchus*, and Beddard's (27) on *Echidna*.

136. ——. On the Existence of a Fourth Species of the Genus *Balænoptera*. J. Anat. Phys. xix. pp. 293–301. [*Cf.* Zool. Rec. xxi. *Mamm.* p. 13.]

137. ——. The Whale Exhibition in Hamburg. Nature, xxxi. p. 362.

138. Günther, A. Guide to the Galleries of *Mammalia* of the British Museum (Natural History). 1885, 8vo, 125 pp.

After an introduction there is a description of the contents of the Mammalian and Osteological galleries. The last section contains an account of the Cetaceans, by Prof. Flower.

139. ——. Note on a Supposed Melanotic Variety of the Leopard from South Africa. P. Z. S. 1885, pp. 243–245, pl. xvi.

Description of a black variety of the Leopard from near Grahamstown.

140. Haacke, W. On the Marsupial Ovum, the Mammary Pouch, and the Male Milk Glands of *Echidna hystrix*. P. R. Soc. xxxviii. pp. 72–74.

Some account of the egg of *Echidna*, discovered by Haacke almost simultaneously with Caldwell. Also remarks on the marsupial pouch in which the egg is incubated.

141. Haddon, A. C. Note on the Blastodermic Vesicle of Mammals. P. R. Dubl. Soc. iv. pp. 536–547.

Gives an explanation of the blastopore of Van Beneden as the spot where the true embryonic area is exposed to the surface, but afterwards sinks below the yelk blastoderm (Deckenzellen).

167. Kilhilton, E. Note on the Supposed Presence of the Wild Cat in Ireland. P. Z. S. 1885, pp. 211–214.

Shows that all the hitherto recorded examples are domestic cats that have run wild.

143. Hartmann, R. Anthropoid Apes, with 63 illustrations. London : 1885, 8vo, 326 pp.

A translation of the German work published in 1884. It deals very fully with the three higher Anthropoids—the Gorilla, Chimpanzee, and Orang—giving full accounts of their external characteristics and of their habits.

144. Hawkins, R. S. The Rabbit Pest in New Zealand. Zool (3) ix. pp. 441–446.

Account of the method now adopted in New Zealand of reducing the number of Rabbits by breeding and turning out Ferrets, by which means the pest has been greatly reduced.

145. Herdman, W. A. A Phylogenetic Classification of Animals. London : 1885, 8vo, 76 pp.

146. *Hiltl, C. Das Reh. Klagenfurt : 1885, 8vo, 64 pp.

147. Hiltner, L. Ueber die Entwicklung des Nervus opticus der Säugetiere. Biol. Centralbl. v. pp. 38–40.

148. Huet, —. Cerfs à acclimater. Bull. Soc. Acclim. 1885, pp. 257–259.

Notes on the acclimatizing of Deer.

149. ——. Sur l'antilope Kob du Sénégal. *T. c.* pp. 145–147.

On the acclimatization of *Kobus sing-sing*, Bennett.

150. Ihering, H. von. Ueber die Fortpflanzung der Gürtelthiere. SB. Ak. Berlin, 1885, pp. 1051–1053.

On the reproduction of *Praopus hybridus*. The author found in two cases eight fœtus in the uterus of *Praopus*, all of one sex ; the author also found that although they each possessed their own amnion, they were provided with a common chorion. The placenta is described as a placenta annularis composita ; *i.e.*, the placenta of each embryo is joined with those of the embryos on either side, so as to form a longitudinal ring.

151. ——. Zur Kenntniss der brasilianischen Mäuse und Mäuseplagen. Kosmos, xvii. pp. 423–427.

152. *Jaworowski, A. O Nieprawidowem wyksztacenin navzadu peiowego u samicy Pawiana (*Cynocephalus* sp.). Kraków : 1884, 8vo, pp. 1–8, 7 pls.

A Polish paper, but with German explanation of plates.

153. Jentink, F. A. A Monograph of the Genus *Cuscus*. Notes Leyd. Mus. vii. pp. 87–119.

4 species are recognized.

154. [Jentink, F. A.] On some Rare and Interesting [illegible] Notes Leyd. Mus. vii. pp. 33–38, pls. i. & ii.

Cf. Hapalemur, Epomophorus, Paradoxurus, Gymnura, and *Ptilocercus.*

155. ——. On Two Re-discovered Antelopes. *T. c.* pp. 269–273, pls. ix. & x.

156. Johnston, H. H. General Observations on the Fauna of Kilimanjaro. P. Z. S. 1885, pp. 214–218.

Notes on the Mammals observed.

157. Jones, M., & Goode, G. B. Contributions to the Natural History of the Bahamas. Bull. U. S. Nat. Mus. No. 25, pp. 145–161.

Part iii. contains an account of the Mammals, by J. M. Jones. The Mammals are 9 in number—2 Bats, 2 Whales, 1 Shrew, and 4 Mice.

158. *Kaczander, J. Beiträge zur Entwicklungsgeschichte der Kaumuskulatur. MT. Embr. Inst. Wien (n.f.) 1 hft, pp. 17–32.

159. *Kallay, A. Die Niere in frühen Stadium des Embryonallebens. MT. Embr. Inst. Wien (n.f.) 1 hft. pp. 51–57, pl. i.

160. *Kangro, C. Ueber Entwicklung und Bau der Steno'schen Nasendrüse der Säugethiere. Dorpat: 1884, 8vo, 31 pp., 2 pls.

161. Kinkelin, F. Ueber zwei südamerikanische diluviale Rieserthiere. Ber. senck. Ges. 1884, pp. 156–164.

Remarks on the skulls of two South American Mammals, *Toxodon* and *Scelidotherium.*

162. ——. Ueber Fossilen aus Braunhohlen der Umgebung von Frankfurt-a.-M. *T. c.* pp. 165–182, pl. i.

Contains a description (p. 175) of a new species of *Hyopotamus.*

163. Kinloch, A. A. Large Game Shooting in Thibet, the Himalayas, and Northern India. New Edition. Calcutta: 1885, 4to, 237 pp.

This work contains a sporting account of most of the larger *Carnivora* and *Ungulata* found in India, and is illustrated with good photogravures of the heads of the various animals.

164. Klaatsch, H. Die Eihüllen von *Phocæna communis,* Cuv. Arch. mikr. Anat. xxvi. pp. 1–50, pls. i. & ii.

On the placentation and embryonic membranes of the Dolphin. A very clear diagrammatic woodcut is given, also histological details.

165. Koganei, J. Untersuchungen über den Bau der Iris des Menschen und der Wirbelthiere. Arch. mikr. Anat. xxv. pp. 1–48, pl. i.

On the histological structure of the iris in the various groups of Mammals.

166. Koken, E. Ueber fossile Säugethiere aus Chine. Pal. Abh. iii. 2, pp. 31–141, 7 pls.

Description of several new species of fossil *Ungulata.* [See *Aceratherium, Mastodon, Palæomeryx, Cervus, Rhinoceros, Hipparion,* and *Camelopardus.*]

167. Kölliker, A. Eine Antwort an Herrn Albrecht in Sachen der Entstehung der Hypophysis und des spheno-ethmoidalen Teiles des Schädels. Biol. Centrabl. v. p. 11.

An answer to and criticism of Albrecht's paper on epipituitary centres of the brain. [See Zool. Rec. xxi. *Mamm.* p. 2.]

168. Kollman, A. Der Tastapparat des Fusses von Affe und Mensch. Arch. Anat. Phys. (Anat.) 1885, pp. 56-101, pls. iii.–v.

On the lines and markings of the feet of Men and Monkeys.

169. Kollman, J. Gemeinsame Entwickelungsbahnen der Wirbelthiere. Arch. Anat. Phys. (Anat.) 1885, pp. 279–306, pl. xii.; Z. wiss. Zool. xli. pp. 517–524.

On the early stages of development, with remarks on gastrulation and primitive streaks.

170. Kolombatovic, J. Imenik Kraljesnjaka Dalmacije. Split.: 8vo, 38 pp.

Account of the vertebrate fauna of Dalmatia. (Mammals, pp. 7–11.)

171. Krüdener, A. von. Zur Naturgeschichte des Elches. Zool. Gart. xxvi. pp. 336 & 337.

172. Lake, P. On a Peculiar Form of *Hippopotamus major* found at Barrington. Geol. Mag. (3) ii. pp. 318–320.

173. Landois, H. Ueber die "aus-gespeiene Milz." Zool. Gart. xxvi. pp. 18–22.

On a story current among horse-breeders in Germany to the effect that the foal, at birth, vomits out its spleen. The mass in question is shown by the author to be neither the spleen nor the placenta, but a product of the large allantoic cavity of the horse, partly organic and partly inorganic.

174. ——. Hasenzucht in enger Gefangenschaft. *T. c.* pp. 359–361.

175. ——. Eine seltene Hirschgeweih-Abnormität. *T. c.* p. 363.

176. Langkavel, B. Aphorismen über Eisbären. Zool. Gart. xxvi. pp. 279–282.

177. ——. Der asiatische Löwe. *T. c.* pp. 338–341.

178. Lankester, E. R. On the Heart described by Professor Owen in 1841 as that of *Apteryx*. P. Z. S. 1885, pp. 239 & 240.

The heart described was really that of *Ornithorynchus*, which must have been substituted for one of *Apteryx* by mistake.

179. Lansdell, H. Russian Central Asia. London: 1885, 8vo, 2 vols.

In an appendix (vol. ii. p. 506), there is an account of the fauna of Russian Turkestan, compiled and translated from many sources, but chiefly from Fedchenko's great work. A list of 83 species of Mammals is given.

180. Lataste, F. Étude de la Faune des Vertébrés de Barbarie. Act. Soc. L. Bord. (4) ix. pp. 129-299.

An exhaustive paper on the fauna of Barbary, with an account of the literature, in which the author points out that hitherto 66 species of Mammals have been obtained from Barbary; to this number he has added 17, of which 9 are new species, 5 belonging to new genera or subgenera. The only new form reached in the parts of the paper published in 1885 is *Bifa lerotina* (p. 250), a new genus and species of Rodent [original description, see 180d]. Following the introduction is a table for the determination of the different species (p. 151); in the second part (p. 184) the different species observed are fully described.

180a-d. ——. Sur *Sciurus persicus*, Orxleben; Le Nat. 1884, pp. 406 & 407. Sur la Vison de France; *op. cit.* 1885, pp. 3-5. Sur le système dentaire du genre *Ctenodactylus*, Gray; *t. c.* pp. 21 & 22. Description d'un nouveau Rongeur; *t. c.* pp. 61-63.

181. Laulanié, —. Sur la nature de la néoformation placentaire et l'unité de composition du placenta. C.R. c. pp. 651-653.

182. ——. Sur l'unité du processus de la spermatogenèse chez les Mammifères. *T. c.* pp. 1407-1409.

183. Leche, W. [See Bronn, H. G.]

184. Leidy, J. *Rhinoceros* and *Hippotherium* from Florida. P. Ac. Philad. 1885, pp. 32 & 33.

185. ——. Remarks on *Mylodon*. *T. c.* pp. 49-51.

186. Lemoine, V. Étude sur quelques Mammifères de petite taille de la faune cernaysienne des environs de Reims. Bull. Soc. géol. (3) xiii. pp. 203-217, pls. x.-xii.

Description of new species. [See *Soricidæ* and *Plagiaulacidæ*.]

187. Loewis, O. von. Ueber das Vorkommen des schwarzen Eichhörnchens in den Ostseeprovinzen. SB. Ges. Dorp. vii. pp. 25-27.

188. ——. Ein junger Nörz, *Fœtorius lutreola*, in der Gefangenschaft. Zool. Gart. xxvi. pp. 353-359.

189. *——. Die wildlebenden baltischen Säugethiere. Balt. Monatsschr. xxxii. pp. 269-488.

190. Lydekker, R. Catalogue of the Fossil *Mammalia* in the British Museum (Natural History). Parts i. (268 pp.) & ii. (324 pp.). London: 1885, 8vo.

Part i. contains the orders *Primates*, *Chiroptera*, *Insectivora*, *Carnivora*, and *Rodentia*; the systematic arrangement adopted is that of Professor Flower in his College of Surgeons' Museum Catalogue. There is a useful table of the European Tertiary strata, and a list of the principal collections which make up the greater part of the British Museum fossil Mammals. Part ii. contains the Artiodactyle Ungulates alone.

191. ——. Description of a Tooth of *Mastodon latidens*, Clift, from Borneo. P. Z. S. 1885, pp. 777-779. pl. xlviii.

Interesting find, since it extends the range of *M. latidens* from Burma, its hitherto Eastern limit, to Borneo.

192. [Lydekker, R.] Note on the Zoological Position of the Genus *Microchœrus*, Wood, and its Apparent Identity with *Hyopsodus*, Leidy. Q. J. Geol. Soc. xli. pp. 529–531.

193. ——. Note on Three Genera of Fossil *Artiodactyla*, with a Description of a New Species. Geol. Mag. (3) ii. pp. 63–73.

Notes on *Cœnotherium*, *Anthracotherium*, and *Chœromeryx*.

194. ——. Note on an Apparently New Species of *Hyopotamus* (*H. picteti*, nobis.). *T. c.* p. 131.

195. ——. A Revision of the Antelopes of the Siwaliks. *T. c.* pp. 169–171.

196. ——. Note on the Generic Identity of the Genus *Esthonyx*, Cope, with *Platychœrops*, Charlesworth (= *Miolophus*, Owen). *T. c.* pp. 360 & 361.

197. ——. Note on a Second Species of Siwalik Camel (*Camelus antiquus*, nobis) (ex Falc. & Cant., MS.). Rec. Geol. Surv. Ind. xviii. pp. 78 & 79.

198. MacGillivray, P. H. Note on the Reproduction of the *Ornithorhynchus*. P. R. Soc. Vict. xxi. pp. 120–122.

Notes on the dissection of 5 specimens of *Ornithorhynchus*, containing both ovarian and uterine ova.

199. Major, C. J. F. On the Mammalian Fauna of the Val d'Arno. Q. J. Geol. Soc. xli. pp. 1–8.

39 species are enumerated. The deposits are of Pliocene age.

200. ——. I cinghiali dell' Italia [*Sus*]. Atti Soc. Tosc. vi. pp. 346–362.

201. Malm, A. H. Om Sowerby's hval (*Mesoplodon bidens*). Œfv. Ak. Förh. 1885, No. 5, pp. 121–153, 1 pl.

Careful description of the osteology of *Mesoplodon bidens*, Sowerby.

202. Martin, K. Ueberreste vorweltlicher Proboscidier von Java und Banka. Sammlungen des Geol.-Reichs-Museums in Leiden, No. 10, pp. 1–24, 1 pl.

Description of *Stegodon* sp.? from Java, and *Elephas sumatranus* from Banka.

203. Matthiessen, L. Ueber den physikalisch-optischen Bau des Auges von *Felis leo*, fem. Arch. ges. Phys. xxxi. p. 68.

A paper on the optical properties of the eye of the Lioness.

204. McCoy, F. Prodromus of the Zoology of Victoria, Decade X. Melbourne: 1885.

Contains description and coloured plate of *Gymnobelideus leadbeateri*, McCoy (p. 7).

205. Melland, B. A Simplified View of the Histology of the Striped Muscle Fibre. Q. J. Micr. Sci. xxv. pp. 371–390, pl. xxiv.

The author demonstrates in transversely-striated muscle-fibres the presence of an intracellular network, of a transverse network, and of a

series of longitudinal rods connecting the transverse networks ; the network explains the appearances of transverse striation and other complicated phenomena presented by muscle-fibre.

206. Merriam, C. H. The Musk Rat as a Fish Eater. Bull. U. S. Fish. Comm. iv. pp. 297 & 298.

207. Metcalfe, A. T. On the Discovery in one of the Bone Caves of Cresswell Crags of a portion of the Upper Jaw of *Elephas primigenius*, containing in situ the first and second milk-molars. Q. J. Geol. Soc. xli. p. 30.

208. Miklouho-Maclay, N. de. On Two New Species of *Macropus* from the South Coast of New Guinea. P. Linn. Soc. N. S. W. ix. pp. 890–895, pl. xxxix.

209. ——. Notes on the Direction of the Hair on the Back of some Kangaroos. *T. c.* pp. 1153–1158, pl. lxxi.

Shows how the hair on the back of certain Kangaroos, especially *Dendrolagus dorianus*, is directed forwards and not backwards, as is normally the case in Mammals.

210. ——. On the Temperature of the Body of *Ornithorhynchus paradoxus*. *T. c.* p. 1204.

Shows that the mean temperature of the body of *Ornithorhynchus* is 76·6° F.

211. ——. On a New Species of *Macropus* (*Macropus tibol*). *Op. cit.* x. pp. 141–144, pl. xix.

212. ——. On Two New Species of *Dorcopsis* from the South Coast of New Guinea. *T. c.* pp. 145–150, pl. xx.

213. ——. Note on the Brain of *Halicore australis*. *T. c.* pp. 193–196, pl xxiv.

214. M'Intosh, W. C. Notes from the St. Andrew's Marine Laboratory. 5. On a Female Porpoise, with notes on its milk. Ann. N. H. (5) xvi. pp. 485–487.

An analysis of the milk is given ; it contains a very large proportion of fat.

215. Mitchell, C. P. Notes, with Commentations, on the Psychology of the Chimpanzee (*Troglodytes niger*) now in captivity at the Central Park Menagerie, New York. J. Comp. Med. vi. pp. 38–53.

216. Mivart, St. G. On the Anatomy, Classification, and Distribution of the *Arctoidea*. P. Z. S. 1885, pp. 340–404.

After an historical introduction, the anatomy of each genus is treated of in regular order ; the classification is then worked out, three families being recognized :—(1) *Procyonidæ*, with subfamilies *Procyoninæ* and *Ailurinæ* ; (2) *Mustelidæ*, with subfamilies *Melinæ*, *Mustelinæ*, and *Lutrinæ* ; (3) *Ursidæ*. Finally the distribution is treated of : the *Procyoninæ* are exclusively New World forms ; the *Ailurinæ* Asiatic ; the *Mustelidæ* and *Ursidæ* cosmopolitan within the range of the suborder.

217. [MIVART, ST. G.] Note on *Viverricula*. P. Z. S. 1885, p. 477.

Correction of an error in the above paper.

218. ——. Notes on the *Pinnipedia*. *T. c.* pp. 484–501.

A series of notes on the skulls and dentition of the various genera is followed by a tabulated list of the characteristics of the *Pinnipedia* generally; the point as to whether the *Pinnipedia* are really of two different stocks, the *Otariidæ* being divided from Ursine Arctoids, the *Phocidæ* from Lutrine forms, is next discussed; this is followed by a few notes on the distribution of the *Pinnipedia*.

219. ——. Notes on the Cerebral Convolutions of the *Carnivora*. J. L. S. xix. pp. 1–25.

220. MÖBIUS, K. Ueber einen bei Sylt gestrandeten Blauwal (*Balænoptera sibbaldii*, J. E. Gray). Schr. Nat. Ver. Schleswig-Holst. vi. pp. 57–60.

Contains measurements and a description of the skeleton.

221. MONTICELLI, F. R. Descrizione di un nuovo *Vespertilio* Italiano. Ann. Acc. O. Costa d. Aspiranti Naturalisti. Era (3) v. 1, pp. 1–8.

Description of a new species of European Bat. [See *Vespertilio*.]

222. *——, F. S. Intorno ad una forma di *Taphozous* (Geoff.) raccolta a Buia da Licata. Napoli: 1885, 8vo, pp. 1–4, 1 pl.

223. MURDOCH, J. Report on the International Polar Expedition to Point Barrow, Alaska. Washington: 1885, 4to.

An account of the Mammals (pp. 92–103) observed is given; there is a list of 25 Mammals, 10 of which are marine.

224. MURRAY, J. A. Description of a New Species of *Mus* from Sind, with note by W. T. Blanford. P. Z. S. 1885, pp. 809 & 810, pl. li.

225. NEHRING, A. Ueber Rassebildung bei den Inca-Hunden von dem Todtenfelde bei Ancon in Peru. SB. nat. Fr. 1885, pp. 5–13.

The author distinguishes 3 varieties of the Inca Dog: a sheepdog-like form, *Canis ingæ pecuarius*; a Dachshund-like form, *C. ingæ vertagus*; and a bulldog-like form, *C. ingæ molossoides*.

226. ——. Ueber die Schädelform und das Gebiss des *Canis jubatus*, Desm. *T. c.* pp. 109–122.

An answer to Prof. Burmeister. [See BURMEISTER (53).]

227. ——. Einige Notizen über Säugethiere und Flussmuscheln der Gegend von Piracicaba in Brasilien. *T. c.* pp. 122–127.

Contains a list of Mammals received from Piracicaba, in addition to those mentioned the year before.

228. ——. Ueber Dachs, Wolf, Hirsch, und Wildschwein Japans. *T. c.* pp. 137–143.

A summary of the papers (233, 234, & 235) published in the Zool. Gart.

229. ——. Ueber eine neue Grison-Art *Galictis* (*Grissonia*) *crassidens*, sp. n., aus dem tropischen Südamerika. *T. c.* pp. 167–175.

230. [Nehring, A.] Ueber den Metacarpus eines sehr grossen Pferdes aus dem Diluvium von Mosbach bei Wiesbaden. SB. nat. Fr. 1885, p. 187.

The Horse shows some affinities to *Hipparion*.

231. ——. Ueber das Geweih eines *Furcifer chilensis* aus Süd-Patagonien. *T. c.* pp. 188–190.

232. ——. Ueber eine neue Art von Wildschweinen (*Sus longirostris*, Nehring) aus Südost-Borneo. Zool. Anz. viii. pp. 347–353.

233. ——. Ueber den Wolf von Nippon. Zool. Gart. xxvi. pp. 161–170.

On a small variety of Wolf from Japan, to be called *Canis lupus* var. *japonica*.

234. ——. Ueber den japanischen Dachs (*Meles anakuma*, Temm.). *T. c.* pp. 225–233.

235. ——. Ueber das japanische Wildschwein (*Sus leucomystax*, Temm.). *T. c.* pp. 325–336.

236. Noack, T. Ein africanischer Hund. *T. c.* pp. 108–114.

On a dog probably a cross between a jackal (*Canis mesomelas*) and an African domestic dog.

237. ——. Zu *Elephas sumatranus*. *T. c.* p. 148.

On the differences between *Elephas sumatranus* and *E. indicus*.

238. ——. Ueber Zeburassen. *T. c.* pp. 205–209.

239. Owen, R. Note on the Resemblance of the Upper Molar Teeth of an Eocene Mammal (*Neoplagiaulax*, Lemoine) to those of *Tritylodon*. Q. J. Geol. Soc. xli. pp. 28 & 29.

240. ——. Notes on Remains of *Elephas primigenius* from one of the Cresswell Bone Caves. Q. J. Geol. Soc. xli. pp. 31–34.

On the milk dentition of the Mammoth.

241. Packard, A. S. Origin of the American Varieties of the Dog. Am. Nat. xix. pp. 896–901.

Shows that several varieties of North American domestic Dogs originated from the grey or prairie Wolf.

242. Pagenstecher, —. Die von Dr. G. A. Fischer auf der Reise in das Massai-Land gesammelten Säugethiere. JB. Hamb. ii. pp. 31–46, pl. i.

List of 31 species of Mammals collected in East Africa, of which 2 are new. [*Cf. Crocidura* and *Nesotragus*.]

243. ——. *Megaloglossus woermanni*, eine neue Form makroglossen Fledermäuse. *T. c.* pp. 125–129, pl. i.

Description of a new species of Bat from Gaboon district.

244. ——. *Megaloglossus woermanni*, g. & sp. nn. Zool. Anz. viii. p. 245.

The discovery of this species in the Gaboon country in Africa increases the range of the rough-tongued fruit-eating Bats immensely. They have hitherto not been found westward of the Himalayas.

245. Parker, W. K. On the Structure and Development of the Skull in the *Mammalia*. Part III. *Insectivora*. P. R. Soc. xxxviii. pp. 129–138 [abstract].

The position of the *Insectivora* as the lowest and most archaic of the Eutherian stock is confirmed. *Galeopithecus*, in which a small parasphenoid has been discovered, must be put in an order by itself; it is intermediate between the lowest Marsupials and the highly specialized frugivorous Bats.

246. Pascoe, F. P. List of British Vertebrate Animals. London: 1885, 16mo.

Mammals, pp. 65–71. 66 are recorded as occurring in Great Britain.

247. Peli, F. Osservazioni sull' organo di Jacobson e sul canale di Stenson nel Cammello. Mem. Acc. Bologn. (4) vi. pp. 181–184. Del muscolo io-epiglottico negli animali domestici; pp. 185–188, 1 pl.

248. Philips, C. The Dog of Sacred History. Zool. (3) ix. pp. 1–3.

249. Phillips, E. L. Notes on the Antelopes of Somali-land. P. Z. S. 1885, pp. 930–932.

Short notes on Antelopes met with by Mr. Lort Phillips in his expedition to Somali-land. The species, 10 in number, were determined by P. L. Sclater. 1 species of Gazelle and 1 of *Neotragus* are probably new.

250. Pilliet, A. Structure de la portion gaufrée de l'estomac du Chameau. Bull. Soc. Z. Fr. x. pp. 40 & 41.

On the histology of the Camel's stomach.

251. ——. Sur les vaisseaux de la cristalloïde postérieure chez les fœtus de Mammifères. *T. c.* pp. 55–59.

252. ——. Sur la glande de Harder du Chameau. *T. c.* pp. 349 & 350.

253. —— & Boulart, R. Sur quelques glandes conglomérées du tégumente externe. *T. c.* pp. 337–347.

On the anatomy of the anal and other skin glands of Mammals.

254. Pittier, H., & Ward, M. F. Contributions à l'histoire naturelle du pays d'enhaut Vaudois. Bull. Soc. Vaud. xxi. p. 111.

Contains a list of the Mammals of Canton Vaud, pp. 119–121, in which 24 species are enumerated.

255. Pouchet, —. Dissection d'un fœtus de Cachalot. C.R. c. pp. 1277–1280.

The author shows that the reservoirs in which the spermaceti is found are nothing more than the extremely modified nasal chamber of the right side.

256. ——. Sur le développement des dents du Cachalot. *Op. cit.* ci. pp. 753 & 754.

On the histological structure and development of the teeth of the Sperm Whale. There is no enamel, and the dentine is in the form of a cone, being very thin at the top.

257. [Pouchet, —.] Sur l'échouement d'une Mégaptère près de la Seyne. C.R. ci. p. 1172.

258. —— & Beauregard, —. Note sur un échouement d' *Hyperoodon*, à Rosendael. *T. c.* pp. 404 & 405.

259. Probst, J. Ueber fossile Reste von *Squalodon*. JH. Ver. Württ. xli. pp. 49–67, pl. i.

260. Pryer, H. Notes on the "Itachi" and *Corvus japonensis*. Tr. A. S. Japan, xiii. pp. 110–113.

[See *Mustelidæ*.]

261. Quick, E. R., & Butler, A. W. The Habits of some *Arvicolinæ*. Am. Nat. xix. pp. 113–118, pl. ii.

Notes on *Synaptomys cooperi*, *Arvicola pinetorum*, *A. riparius*, and *A. austerus*.

261A. Ramsay, E. P. Description of the Marsupial Egg of *Echidna*. Ann. N. H. (5) xvi. p. 479.

A short letter to Prof. Owen on a live female *Echidna* with an egg in her pouch.

262. Ranvier, L. Les membranes muqueuses et la system glandulaire. J. Microgr. 1885, pp. 6, 55, 103, 155, 194, 240, & 287.

263. *Raubold, O. Die eigenthümlichkeiten der Kopfknochen des Rindes auf ihren Werth zur Definition der Rasse geprüft, hauptsächlich am Schädel des Holländer Rindes. Leipzig: 1885, 8vo, pp. 1–43, pl. i.

264. Regel, A. Lettres adressés à M. le Vice-President Dr. Renard. Bull. Mosc. lviii. pp. 220–234.

Contains an account of the fauna of Amu Daria, in Central Asia.

265. Retterer, E. Sur le développement des tonsilles chez les Mammifères. C.R. ci. pp. 1284-1286.

On the histological structure of the tonsils; they consist chiefly of excretory glands with ducts, and glands without ducts.

266. ——. Le développement du squelette des extrémités et les production cornées des Mammifères. Rev. Sci. (3) ix. pp. 501 & 502.

267. Reuter, J. Ein Beitrag zur Lehre von Hermaphroditismus. Verh. phys.-med. Ges. Würtzburg, xix. No. 2, pp. 1–48, pl. ii.

Interesting account of three hermaphrodite young pigs, all born together from a normal mother.

268. Rochebrune, A. T. de. Sur une espèce nouvelle du genre *Bubalus* provenant de la haute Sénégambie. Bull. Soc. Philom. (7) ix. pp. 15–19.

269. ——. Vertebratorum novorum vel minus cognitorum oræ Africæ occidentalis incolarum diagnoses. *T. c.* pp. 86–88.

Descriptions of three Rodents and a new Lynx.

270. Rope, G. T. On the Range of the Dormouse in England and Wales. Zool (3) ix. pp. 201–213.

The Dormouse appears to be found more frequently in the southern and western counties, and to be rarer in the northern and eastern.

271. Rubattel, R. Recherches sur le développement du cristallin chez l'homme et quelques animaux supérieurs. Rec. Z. Suisse, ii. pp. 203–231, pls. vii. & viii.

Notes on the development of the lens. The principal conclusion seems to be that the capsule of the lens is mesoblastic in origin.

272. Rüdinger, N. Ueber eine Drüse auf der Stirn- und Scheitel-region bei Antelopen. SB. bayer. Ak. 1885, pp. 110–112.

On a certain large gland found between the horns on the head of the Gemsbock (*Oryx capensis*).

273. Ruge, G. Ueber die Gesichtmuskulatur der Halbaffen. Morph. JB. xi. pp. 243–315, pls. xiv.–xvi.

On the comparative myology of the face of certain Lemurs. [See *Lemuridæ*.]

274. Rütimeyer, L. Studien zu der Geschichte der Hirschfamilie. I. Schädelbau. Verh. Ges. Basel, vii. pp. 3–61.

Account of the modifications of the skull in all the genera of recent *Cervidæ*, and also some account of the fossil forms.

275. Ryder, J. A. On the Development of the Mammary Glands and genitalia of the *Cetacea*. Bull. U. S. Fish. Comm. v. pp. 135–142.

276. ——. On the Development of the Mammary Glands of *Cetacea*. Am. Nat. xix. pp. 616–618.

277. ——. On the Genesis of the Extra Terminal Phalanges in the *Cetacea*. *T. c.* pp. 1013–1015.

The extra digits of the phalanges of *Globicephalus* are ossified in the primitive blastema at a much later date than the true digits, and are compared with the cartilaginous extensions of the phalanges of certain *Pinnipedia*, whence the conclusion is drawn that the *Cetacea* are derived from some Pinnipedian-like form.

278. Sanson, A. Sur les Équidés quaternaires. Bull. Soc. Anthrop. (3) vii. pp. 37–51.

On the remains of a species of *Equus*.

279. *Schleich, G. Der Augengrund des Kaninchens und des Frosches. Tübingen : 1885, 8vo, 16 pp., 3 pls.

280. Schlosser, M. Nachträge und Berichtigungen zu : "die Nager des europäischen Tertiärs." Palæontogr. xxxi. pp. 323–328. [*Cf.* Zool. Rec. xxi. *Mamm.* p. 28.]

281. ——. Zur Stammesgeschichte der Hufthiere. Zool. Anz. viii. pp. 683–687.

The author agrees with Cope in considering the *Condylarthra* as the most primitive stock, from which all Ungulates have descended.

282. Schmidt, M. Das Walross (*Trichechus rosmarus*). Zool. Gart. xxvi. pp. 1–16, 33–40, & 65–73, pl. i.

On the habits of the living animal in captivity.

283. Schmidt, O. The *Mammalia* in their Relation to Primeval Times. London : 1885, 8vo, 308 pp.

Translation of the German original. [*Cf.* Zool. Rec. xxi. *Mamm.* p. 28.]

284. ——. Berichtigungen zu Oscar Schmidt, die Säugethiere, etc. Zool. Anz. viii. pp. 562 & 563.

Corrections to the above work.

285. Sclater, P. L. Description of a New Species of Muntjac. P. Z. S. 1885, pp. 1 & 2, pl. i.

Description of *Cervulus crinifrons*, from Ningpo, China.

286. ——. Note on *Lemur macaco*, and on the way in which it carries its young. *T. c.* pp. 672 & 673.

The young Lemur is carried transversely across its mother's belly, and, passing its long tail round her back, curls it round its own neck.

287. ——. Exhibition of, and Remarks upon, a Skull of an American Tapir. *T. c.* p. 718.

The Tapir in question was not *Tapirus roulini*, as it had been described and figured (P. Z. S. 1878, p. 632), but, as was evident now that the skull could be examined, merely a dark variety of *T. americanus*.

288. Scott, W. B. *Cervalces americanus*, a Fossil Moose, or Elk, from the Quarternary of New Jersey. P. Ac. Philad. 1885, pp. 181–202, pl. ii.

The author forms a new genus for this species, formerly *Cervus americanus*, in consequence of the discovery of an almost complete skeleton.

289. ——. A Fossil Elk, or Moose, from the Quarternary of New Jersey. Science, v. pp. 420–422.

Is identical with a species called *Cervus americanus* by Harlan in 1825; but it must be put in a new genus. *Cervalces* is the name proposed for it.

290. Selenka, E. Ueber die Entwicklung des Opossum (*Didelphys virginiana*). Biol. Centralbl. v. pp. 294 & 295.

Some preliminary facts about the development of Marsupials. Fertilization of the ovum takes place at the lower end of the oviduct; the period of gestation is only eight days; the segmentation is intermediate between holoblastic and meroblastic.

291. Severin, —. Untersuchungen über das Mundepithel bei Säugethieren. Arch. mikr. Anat. xxvi. pp. 81–88, pl. v.

292. Sharp, B. Homologies of the Vertebrate Crystalline Lens. P. Ac. Philad. 1884, pp. 300–310.

The author traces the gradual evolution of the eye upwards from the simple mantle eyes of *Ostrea* and other Lamellibranchs.

293. Shufeldt, R. W. Description of *Hesperomys truei*, a new species belonging to the subfamily *Murinæ*. P. U. S. Nat. Mus. viii. pp. 403–408, pl. xxi.

294. Sidebotham, E. J. On the Myology of the Water Opossum. P. Z. S. 1885, pp. 6–22.

Full description of all the muscles of *Chironectes variegatus*.

295. Sigel, W. L. Aus den ersten Lebenstagen eines zweihöckerigen Kamels. Zool. Gart. xvi. pp. 104–108.

296. Smets, G. Les Mystacocètes. Rev. Quest. Sci. ix. pp. 435–466.

Contains a general account of the 3 families, *Balænidæ*, *Megapteridæ*, and *Balænopteridæ*, with more detailed accounts of the 4 species of *Balænoptera* found in the N. Atlantic—*B. rostrata*, *borealis*, *musculus*, and *sibbaldii*.

297. Snelleman, J. F. Zoogdieren en Vogels. Midden Sumatra, i.

Contains a list of the Mammals of Middle Sumatra (pp. 1–29) and a coloured plate of *Lepus netscheri*, Schleg.

298. Southwell, T. Notes on the Seal and Whale Fishery of 1884. Zool. (3) ix. pp. 81–88.

299. ——. Notes on the White-Beaked Dolphin (*Lagenorhynchus albirostris*). Tr. Norfolk Soc. iv. pp. 120–124.

300. Steinvorth, H. Ein Beitrag zur Geschichte des Rattenkönigs. JH. Ver. Lüneb. ix. pp. 128–130.

301. Stolzmann, J. Description d'un nouveau Rongeur du genre *Cælogenys*. P. Z. S. 1885, pp. 161–167.

Description of *Cælogenys taczanowskii*, from Ecuador.

302. Struthers, J. On the Rudimentary Hind Limb of *Megaptera longimana*. Am. Nat. xix. pp. 124 & 125.

303. ——. On Finger Muscles in *Megaptera longimana* and in other Whales. *T. c.* p. 126.

304. Sutton, J. B. On the Development and Morphology of the Human Sphenoid Bone. P. Z. S. 1885, pp. 577–587, pl. xxxv.

A paper in support of certain homologies; among others, the homology of the Amphibian parasphenoid and Mammalian vomer.

305. ——. Diseases of the Reproductive Organs in Frogs, Birds, and Mammals. J. Anat. Phys. xix. pp. 121–143, pl. viii.

Investigations as to how far the rule holds true that cysts may originate in functionless ducts and tubules.

306. ——. The Nature of Ligaments. *T. c.* pp. 241–265, pl. xii.; *op. cit.* xx. pp. 39–75, pl. iii.

307. ——. Tumours in Animals. *Op. cit.* xix. pp. 415–475, pl. xxiii.

On the comparative pathology of tumours. No tumours are peculiar to man; sarcomata, fibromata, osteomata, and enchondromata, are the

most widely diffused of these growths; fatty tumours being almost entirely confined to domesticated animals.

308. Swertschkoff, A. von. Das Tierleben in Ceylon. Zool. Gart. xxvi. pp. 129–134.

309. *Tapie, J. De la polydactylie. Paris: 1885, 8vo, 54 pp., 2 pls.

310. Teglás, G. Neuere Funde von *Ursus spelæus*, Blumb., in Ungarn. Math. Nat. Ber. Ung. ii. pp. 454–460.

Description and measurement of remains of *Ursus spelæus*.

311. Thomas, O. Report on the Mammals obtained and observed by Mr. H. H. Johnston on Mount Kilima-njaro. P. Z. S. 1885, pp. 219–222, pl. xii.

Notes on the Mammals observed, with description of *Colobus guereza caudatus*, subsp. n.

312. ——. Notes on the Characters of the Different Races of *Echidna*. *T. c.* pp. 329–339, pls. xxiii. & xxiv.

The conclusions arrived at are that there are only 2 true species of *Echidnidæ*, *E. aculeata* and *Proechidna bruijnii*. Of the former, however, there are 3 well-marked varieties: *E. aculeata lawesi*, from New Guinea; *E. aculeata typica*, from Australia; *E. aculeata setosa*, from Tasmania. The recently described *E. acanthion*, Collett, is not even a variety of the common *E. aculeata*.

313. ——. Exhibition of, and Remarks on, a Burrowing Rodent (*Heterocephalus phillipsi*). *T. c.* pp. 611 & 612.

Description of the new species, with a letter on its habits from Mr. E. Lort Phillips, its discoverer.

314. ——. Notes on the Rodent Genus *Heterocephalus*. *T. c.* pp. 845–849, pl. liv.

Notes on the two species of this remarkable hairless genus of Rodents. The author shows that it must be placed near *Georychus*.

315. ——. Pangolin. Encycl. Brit. xviii. p. 210.

General account of the genus *Manis*.

316. ——. Phalanger. Encycl. Brit. xviii. p. 727.

A complete monograph of the genera of the subfamily *Phalangistinæ*.

317. *Toni, E. de. Sopra un cranio d'Orso trovato nella Caverna detta il Buco di S. Donà in distretto di Fonzaro (*Ursus spelæus*). Bull. Soc. Ven. Trent. 1885, pp. 124 & 125.

318. Townsend, C. H. An Account of Recent Captures of the Californian Sea Elephant, and Statistics relating to the Present Abundance of the Species. P. U. S. Nat. Mus. viii. pp. 90–93.

Note on the occurrence of *Macrorhinus angustirostris*, supposed to be almost extinct, on the Californian coast.

319. Trotter, S. The Significance of the "Collar Bone" in the *Mammalia*. Am. Nat. xix. pp. 1172–1177.

Showing how the presence of a clavicle in the *Mammalia* is correlated with fossorial, aerial, and arboreal habits.

320. TROUESSART, E. L. Catalogue des Mammifères vivant et fossiles. Fascicule IV. Carnivores. Extr. du Bull. Soc. d'Études scientifiques d'Angers, xv. 108 pp.

This is a catalogue of all the known species, recent and fossil, of *Carnivora*. The *Creodonta* are included, forming the first sub-order, and the *Carnivora Fissipedia* as a second sub order. The *Pinnipedia* are not included in the list. To each species is appended a reference to the original description and any later important description; the locality of both living and fossil specimens is also given. No less than 593 species are catalogued, belonging to 180 genera and subgenera.

321. *——. Mammifères de la France. Paris: 1885, 8vo, 359 pp.

322. ——. Note sur le Rat Musqué (*Mus pilorides*) des Antilles. Ann. Sci. Nat. (6) xix. Art. 5, 18 pp., pl. i.

A discussion as to the true systematic place of this Rat. The author considers it to form a separate subgenus of the genus *Hesperomys*, which subgenus he named in 1881 (C.R. xcii. p. 199) *Megalomys*.

323. TRUE, F. W. On a New Species of Porpoise, *Phocæna dalli*, from Alaska. P. U. S. Nat. Mus. viii. pp. 95-98, pls. ii.–v.

The author reduces the number of species of *Phocæna* to 3: *P. communis*, *P. lineata* and *P. spinipinnis*; to this he adds a fourth as above.

324. ——. Contributions to the History of the Commander Islands. No. 5. Description of a new species of *Mesoplodon*, *M. stejnegeri*, obtained by Dr. Leonard Stejneger, in Bering Island. *T. c.* pp. 584 & 585, pl. xxv.

325. ——. A Note on the *Hyperoodon semijunctatus* of Cope. *T. c.* pp. 585 & 586.

The author having examined the type specimen, comes to the conclusion that the species really belongs to *Ziphius* rather than to *Hyperoodon*.

326. ——. Porpoise Fishing at Cape May, New Jersey. Bull. U. S. Fish. Comm. iv. pp. 431 & 432.

Account of the capture of *Tursiops tursio*.

327. ——. The Bottle-Nose Dolphin, *Tursiops tursio*, as seen at Cape May, New Jersey. Science, v. pp. 338 & 339.

328. TURNER, W. On Fossil Bones of Mammals obtained during Excavations at Silloth. P. Phys. Soc. Edinb. viii. pp. 333–338.

On remains of *Bos primigenius* and *Cervus elephas*.

329. ——. The Dumb-Bell-shaped Bone in the Palate of *Ornithorhynchus* compared with the pre-nasal bone of the Pig. J. Anat. Phys. xix. pp. 214–217.

Shows that the dumb-bell-shaped bone of *Ornithorhynchus* is not homologous with the pre-nasal bone of the Pig, but is really a part of the pre-maxilla.

330. [Turner, W.] The Anatomy of a Second Specimen of Sowerby's Whale (*Mesoplodon bidens*) from Shetland. J. Anat. Phys. xx. pp. 144–188, pl. iv.

General account of the anatomy and osteology.

331. Türstig, J. Entwickelung der primitiven Aorten. SB. Ges. Dorp. vii. pp. 41 & 42.

332. *Vialleton, L. Contribution à l'étude de l'endartère de l'homme et des animaux mammifères. Lyons : 1885, 8vo, 86 pp., 3 pls.

333. Virchow, H. Ueber die Form der Falten des Corpus ciliare bei Säugethieren. Morph. JB. xi. pp. 437–453, pl. xxv.

Description of the folds of the ciliary body of the eye in the various Mammalian Orders.

333a. Westling, C. Beiträge zur Kenntnis des Peripherischen Nervensystems. Bih. Sv. Ak. Handl. ix. 8, 48 pp., 3 pls.

Pithecus satyrus and *Ornithorhynchus paradoxus* were the objects of examination.

334. Wiedersperg, G. Von. Beiträge zur Entwickelungsgeschichte der Samenkörper. Arch. mikr. Anat. xxv. pp. 113–136.

Studies on spermatogenesis.

335. Wilckens, M. Die Abstammung der Rindes und die tertiären Formen desselben. Biol. Centralbl. iv. pp. 749–766.

Account of the ancestors of the *Bovidæ*, the earliest form being *Gelocus*, described first by Kowalevsky.

336. ——. Die Rinder des Diluviums und der Pfahlbauten. *Op. cit.* v. pp. 79–95 & 109–123.

A general account of the fossil *Bovidæ*.

337. ——. Die schweineartigen Tiere (Suiden). *T. c.* pp. 208–222, 233–241, 263–270, & 295–308.

A general account of what has been written about fossil *Suidæ*.

338. ——. Die kamelartigen Tiere (Cameliden). *T. c.* pp. 418–434.

A similar account of the Camels.

339. ——. Die hundeartigen Tiere (Caniden) des Tertiärs. *T. c.* pp. 459–465, 489–499, & 518–529.

A similar account of Tertiary *Canidæ*.

340. ——. Die hundeartigen Tiere (Caniden) des Diluviums. *T. c.* pp. 597–604 & 621–627.

341. *——. Form und Leben der landwirthschaftlichen Hausthiere. Berlin : 1885, 8vo, pp. 1–952, 42 pls., and 172 woodcuts.

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Notes on the different genera, with conclusions as to their past and present distribution, and a complete list of recent (6 species) and fossil (30 species) *Sirenia*.

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AVES.

BY

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

The most remarkable ornithological work which has appeared during the 1885 is, without doubt, the volume of "The Standard Natural His- " treating of "Birds," edited by Mr. J. S. Kingsley. To this Dr. Stejneger is the chief contributor, and whether his opinions commend themselves to his fellow-ornithologists or not, all will admit that the breadth of view which he displays takes the book at once out of the category of ordinary popular works, and places it on a thoroughly scientific footing. The taxonomic scheme which he propounds is one almost entirely new, that is, as regards the larger divisions of the Class *Aves*, and especially in relation to its fossil forms. When he arrives at forms which still exist, his plan will be seen not to vary very greatly from those which have been of late years set forth. A summary of his method is given below, and this may be found useful, since, in the book itself, no concise statement of the results at which he has arrived is afforded, and even the outline of his plan can only be gathered by a somewhat close study of the contents of the volume. It being no part of a Recorder's business to review a work of this kind, no notice need here be taken of many matters that are, or at least seem, open to objection or criticism. On these the student must judge for himself; but it is the Recorder's duty to point out that, whatever be the future of ornithological taxonomy, Dr. Stejneger's labours can be in no wise neglected by any worker on Systematic Ornithology. Other works of importance published during the past year, so far as they relate to Geographical Areas, may be found under the following names. See also Beddard, Dresser, Gadow, Hargitt, Harvie-Brown, Newton [E. T.], Reichenow, Saunders, Sclater, Seebohm, Sharpe.

Palæarctic Region: Clarke & Backhouse (Iceland), Lilford (Britain), Olphe-Galliard (W. Europe), Tait (Portugal).

Ethiopian: Böhm (Cent. Africa), Büttikofer (Liberia), Milne-Edwards & Oustalet (Grand Comore), Milne-Edwards & Grandidier (Madagascar), Shelley (Kilima-njaro and Somali Land).

Indian: Blasius (Celebes), Forbes (Eastern Archipelago), Guillemard (Sulu Archipelago, Borneo, Sumbawa, Celebes), Kutter (Borneo), Menzbier (Kashgaria, Russia), Potanin (Mongolia), Salvadori & Giglioli (Cochin China), Seebohm (Japan), Vorderman (Java).

AUSTRALIAN: Crowfoot (Norfolk I.), Finsch & Meyer (N. -lia. Gould [Sharpe] (New Guinea), Guillemard (New Guinea and Papu.. Hutton (New Zealand), Ramsay (New Guinea, Australia, New Britain), Tristram (Norfolk I.).

NEARCTIC: Brewster (Arizona, &c.), Coues (N. America), Merriam (U.S.), Murdoch (Alaska), Ridgway (N. America), Stejneger (Kamtschatka).

NEOTROPICAL: Berlepsch & Jhering (Brazil), Blasius (Bolivia), Cory (Haiti, W. Indies, &c.), Gibson (Uruguay), Godman & Salvin (Cent. America) James [H. B.] (Chili), Ridgway (Cozumel I.), Salvin (Cozumel, B. Guiana), Taczanowski & Berlepsch (Ecuador), Zeledon (Costa Rica).

For Extinct Species, see: Baur, Blasius, Dames, Grieve, Haast, Newton [E. T.], Smith [W. W.], Vetter, Woodward.

For Anatomical, Morphological, and Physiological papers, see: Beddard, Blasius, Buchet, Camerano, Carrière, Cazin, Dareste, Gadow, Gerlach, Green, Kitchen, Krukenberg, Laffont, Lankester, Lindsay, Magnien, Meyer, Owen, Rochas, Shufeldt, Stolzmann, Strasser, Sutton.

For Classification and Encyclopædias [or articles], see: Coues, Ersch & Gruber, Förster, Kingsley, Newton [A.], Stejneger.

A new periodical has been issued at Vienna, viz., "Ornis: Internationale Zeitschrift für die gesammte Ornithologie. Organ der permanenten internationalen ornithologischen Comité," under the editorship of Drs. R. Blasius and G. v. Hayek.

THE GENERAL SUBJECT,

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

Report on the Migration of Birds in the Spring and Autumn of 1884, by J. A. Harvie-Brown, J. Cordeaux, R. M. Barrington, A. G. More, & W. E. Clarke. London: 1885, 8vo, 186 pp., map.

Containing returns from E. and W. coasts of England, Wales, Scotland, and Ireland, with Ocean Notes and a map marking the Stations. [*Cf.* Zool. Rec. xxi. *Aves*, p. 2.]

VIII. Jahresbericht (1883) des Ausschusses für Beobachtungsstationen der Vögel Deutschlands. J. f. O. 1885, pp. 225–337. [*Cf.* Zool. Rec. xxi. *Aves*, p. 2.]

AGESBORG, G. S. The Birds of South-Eastern Dakota. Auk, ii. pp. 276–289. Revised by W. W. COOKE.

The author gives a list of 226 species.

ALLEN, J. A. Sexual Selection and the Nesting of Birds. Auk. ii. pp. 129–139.

The author criticises Dixon's paper [in Seebohm's "History of British Birds"] on the protective colour of eggs.

F C. Comparaison des organes du vol dans la série animale. An. Sci. Nat. (6) xix. Art. 2. [Birds, pp. 198–210.]

ARMISTEAD, J. J. Notes on Birds of the Solway District. Nat. 1885, pp. 293–298.

ATKINSON, E. T. The Himálayan Districts of the North-Western Provinces of India. Vol. ii. [Forming vol. xi. of the Gazetteer N.W. Prov.] Allahabad: 1884, 8vo, xviii. & 964 pp., map, 2 pls., cuts. [Birds, pp. 48–73.]

AYRES, T. Additional Notes on the Ornithology of Transvaal. Communicated by J. H. GURNEY. Ibis, 1885, pp. 341–351. [*Cf.* Zool. Rec. xxi. *Aves*, p. 3.]

8 species are added, with notes on the occurrence and breeding of others.

BACKHOUSE, J. Notes on the Avifauna of Upper Teesdale. Nat. 1885, pp. 353–364.

——. [See also CLARKE, W. E.]

BAIN, F. Winter Birds of Prince Edward Island. Auk, ii. pp. 262–267.

BALL, V. On the Identification of the Animals and Plants of India which were known to early Greek Authors. P. R. Irish Ac. 1885, pp. 302–346. [Birds, pp. 322–325.]

BARNES, H. E. Handbook to the Birds of the Bombay Presidency. Calcutta: 1885, 8vo.

An abbreviatio part of Jerdon's Birds of India.

——. [See also S SHOE, C.]

BARROWS, W. B. [See KINGSLEY, J. S.]

BATCHELDER, C. F. Winter Notes from New Mexico. Auk, ii. pp. 121–128 & 233–239 [*cf.* p. 306].

BAUER, P. F. S. Ornithologische Notizen [Austria, &c.] MT. orn. Ver. Wien, 1885, pp. 18 & 19.

——. [See also *Nucifraga caryocatactes* (*Corvidæ*).]

BAUR, G. Dinosaurier und Vögel. Morph. JB. 1885, pp. 446–454. [See DAMES, W.]

——. Bemerkungen über das Becken der Vögel und Dinosaurier. *T. c.* pp. 613–616.

BAYER, A. [See *Nucifraga caryocatactes* (*Corvidæ*).]

BECKHAM, C. W. Notes on some of the Birds of Pueblo, Colorado. B Auk, ii. pp. 139-144.

——. List of the Birds of Nelson County. Kentucky Geol. Surv. Frankfort [U.S.]: 1885, roy. 8vo, 58 pp.

BEDDARD, F. E. On the Aftershaft in the Feathers of certain Birds. Ibis, 1885, pp. 19–23.

The author corrects various statements of A. T. de Rochebrune [Faune de la Sénégambie, Act. Soc. L. Bord. viii. p. 85], which tend to contradict Nitzsch [Pterylography; London. 1867].

[Beddard, F. E.] The Collected Scientific Papers of the la. Alexander Forbes, M.A. London: 1885, 8vo, xiii. and 4[illegible] 25 pls., and portrait.

A preface by P. L. Sclater gives some account of Forbes' life.

——. Notes on the Visceral Anatomy of Birds. No. 1. On the so-called Omentum. P. Z. S. 1885, pp. 836–844, cuts.

Description of the "Omentum" (*pseudepiploon*) of Ostriches, Cranes, Storks, and Hornbills. Certain reptilian features are noticeable in this organ, "but the Ostrich tribe are not more Crocodilian in the character of their abdominal viscera than many other birds."

——. [See also *Cuculidæ*, *Apterygidæ*.]

Bennett, K. H. [See *Falco subniger* (*Falconidæ*), *Glareola grallaria* (*Charadriidæ*).]

Berlepsch, H. v., & Jhering, H. v. Die Vögel der Umgegend von Taquara do Mundo Novo, Prov. Rio Grande do Sul. Z. ges. Orn. 1885, pp. 97–184, pls. vi.–ix.

The authors include 234 species, 5 of which are new to Brazil [p. 109].

——. [See also Taczanowski, L., *Chlorospingus reyi* (*Tanagridæ*), *Ochthœca consobrina* (*Tyrannidæ*), *Attila griseigularis* (*Cotingidæ*), spp. nn.]

Bewick, T., A Memorial Edition [5 vols.] of the works of. Vols. i. & ii. History of British Birds; Land Birds, and Water Birds; with wood-cuts of the Supplements incorporated. Newcastle-on-Tyne: 1885, 8vo [reprint of the Edition of 1847].

Bicknell, E. P. A Study of the Singing of our [American] Birds. Auk, ii. pp. 144–154 & 249–262. [*Cf.* Zool. Rec. xxi. *Aves*, p. 5.]

Bingham, C. [See *Micropternus* (*Picidæ*).]

Blasius, W. Beiträge zur Kenntniss der Vogelfauna von Celebes. Z. ges. Orn. 1885, pp. 201–328, pls. xi.–xiv.

This important paper contains information about 56 species collected by Dr. Platen at Mangkassar, on the west coast of the southern part of the island, and at various places in the district of Tjamba, nearer the mountains. [See *Prioniturus* (*Psittaci*), *Merops philippinus* var. n. *celebensis* (*Meropidæ*), *Centrococcyx javanensis* (*Cuculidæ*), *Cyrtostomus frenatus* var. n. *plateni* (*Nectariniidæ*), pl., *Basilornis celebensis* (*Sturnidæ*), *Alophonerpes wallacii* (*Picidæ*), pl., *Streptocitta albicollis* (*Corvidæ*), pl., *Ptilopus temmincki* (*Columbidæ*), pl.]

——. Neue Thatsachen in Betreff des Aussterbens von *Alca impennis* L. (nach brieflichen Mittheilungen von A. Newton und W. Preyer). J. f. O. 1885, pp. 398–400. [*Cf.* Zool. Rec. xxi. *Aves*, p. 5.]

——. Beitrag zur Kenntniss der Vogelfauna von Celebes. *T. c.* pp. 402 & 403.

——. Osteologische Studien (Messungs-Methoden an Vogel-Skeletten). *T. c.* pp. 409–415.

A paper on a method of recording measurements of skeletons.

...] Ueber einige Vögel von Cochabamba in Bolivia (nach ...eflichen Mittheilungen des Herrn Prof. Eug. von Boeck). *T. c.* pp. 416–419. [*Cf.* Zool. Rec. xxi. *Aves*, p. 6.]

Bligh, S. [See *Baza ceylonensis* (*Falconidæ*).]

Böhm, R. Ornithologische Notizen aus Central-Afrika, iii. J. f. O. 1885, pp. 35–49. [*Cf.* Zool. Rec. xx. *Aves*, p. 4.]

83 species from Waidmannsheil, Gonda, Urambo, Sassagula, Kakoma, &c.

——. ——. Nachtrag i. *T. c.* pp. 50–61.

60 species from Gonda, Kakoma, &c.

——. ——. Nachtrag ii. *T. c.* pp. 61–67.

16 species from Karema, East Coast of Tanganyika, &c.

——. ——. Nachtrag iii. *T. c.* pp. 67–73.

11 species from Karema, &c.

Booth, E. T. Rough Notes on the Birds observed during twenty years' shooting and collecting in the British Islands. Pt. ix. London: 1885, fol., discontinuous pagination. [*Cf.* Zool. Rec. xxi. *Aves*, p. 6.]

Containing Cuckoo, Lark, Hedge Sparrow, Dartford Warbler, Wood Pigeon, Turtle Dove, Dotterel (pl.), Black-tailed Godwit (pl.), Water Rail, Moorhen, Shoveller (3 pls.), Great Crested Grebe (pl.), Lesser and Greater (pl.) Black-backed Gull, Fulmar (pl.).

Brewster, W. Preliminary Notes on some Birds obtained in Arizona by Mr. F. Stephens in 1884. Auk, ii. pp. 84 & 85. [See *Calligena clemenciæ* (*Trochilidæ*).]

——. Additional Notes on some Birds collected in Arizona and the adjoining Province of Sonora, Mexico, by Mr. F. Stephens, in 1884; with a description of a new species of *Ortyx*. *T. c.* pp. 196–200. [See *Colinus ridgwayi*, sp. n. (*Tetraonidæ*).]

——. [See also *Helinæa swainsoni* (*Mniotiltidæ*), *Peucæa æstivalis* (*bachmani*) (*Fringillidæ*), *Lagopus rupestris*, *L. welchi*, sp. n., *Cupidonia pinnata*, sp. n. (*Tetraonidæ*).]

Brigham, E. M. [See *Opisthocomus cristatus* (*Opisthocomidæ*).]

Broadbent, K. The Migration of Birds at the Cape York Peninsula. P. R. Soc. Queensl. i. pp. 93–96.

Bronn, H. G. Klassen und Ordnungen des Thier-Reichs, wissenschaftlich dargestellt in Wort und Bild. Fortgesetzt von Dr. Hans Gadow in Cambridge. Sechster Band. iv. Abtheilung. Vögel: *Aves* [B. Muskeln der Extremitäten] 10 Lieferung, pp. 177–208, pl. xxv.; 11 & 12 Lieferung, pp. 209–272, pl. xx.*a*. Leipzig und Heidelberg: 1885, 8vo. [*Cf.* Zool. Rec. xxi. *Aves*, p. 7.]

Brooks, W. E. Stray Ornithological Notes. Ibis, 1885, pp. [illegible]. [See *Phylloscopus seebohmi*, *P. viridipennis*, and *P. presbytis* (*Sylviidæ*); *Linota exilipes* (*Fringillidæ*), *Aquila falcescens*, *Milvus govinda* (*Falconidæ*).]

Browne, M. Notes on the Vertebrate Animals of Leicestershire. *Aves*. Zool. 1885, pp. 332–338, 414–421, & 459–467.

Buchet, G. Sur un tendon faisant partie de l'appareil tenseur de la membrane axillaire. Le Nat. 1885, pp. 35 & 36.

The species taken as examples are *Fulica atra*, *Crex pratensis*, *Querquedula circia*, *Coturnix communis*.

Bunge, A. Bericht über fernere Fahrten im Lena-Delta und die Ausgrabung eines angeblich vollständigen Mammuthcadavers. Bull. Pétersb. xxx. pp. 227–282. [*Cf.* Zool. Rec. xxi. *Aves*, p. 8.]

A few notes on Birds are included.

Büttikofer, J. Zoological Researches in Liberia. A List of Birds collected by J. Büttikofer and C. F. Sala in Western Liberia, with Biological Observations. Notes Leyd. Mus. vii. pp. 129–256, pl. xi. and map.

A very interesting account of 162 species, with much information as to nests, eggs, &c. [See *Trichophorus poliocephalus* (*Timeliidæ*), *Pyrenestes personatus* and *P. coccineus* (*Ploceidæ*), *Halcyon malimbica* (*cinereifrons*) (*Alcedinidæ*), *Buceros pulchrirostris* (*camurus*) (*Bucerotidæ*), *Centropus francisci* (*Cuculidæ*), *Psittacus timneh* (*Psittacidæ*), *Columba unicincta*, pl., *Peristera puella* (*Columbidæ*), *Glareola megapoda* (*Charadriidæ*).]

Buxton, E. N. Epping Forest. London: 1885, 12mo, xii. and 139 pp., 25 cuts, 6 maps. [Birds, pp. 81–99.]

Cabanis, J. [See *Chrysotis tucumana* (*Psittaci*), sp. n.]

Caldwell, J. [See *Didus ineptus* (*Dididæ*).]

Camerano, L. Ricerche intorno alla Distribuzione dei Colori nel Regno Animale. Torino: 1884, 34 pp., 2 col. pls. [From Mem. Acc. Tor. ser. ii. tom. xxxvi.]

——, & Lessona, M. Compendio della Fauna Italiana. Descrizione elementaire degli Animali più importanti. Torino-Roma-Milano-Firenze: 1885, 8vo, viii. & 314 pp, 575 cuts. [*Aves*, pp. 28–61.]

Capek, V. Einige Notizen aus Mähren. MT. orn. Ver. Wien, 1885, pp. 199–201.

Carlson, A. Öfversigt af de i Almesåkra socken, Jonkopings-län, förekommande foglar. Œfv. Ak. Förh. 1882, No. 1, pp. 21–38 [1883].

Carrière, J. Die Sehorgane der Thiere vergleichend-anatomisch dargestellt. München und Leipzig: 1885, 8vo, vi. & 205 pp., 1 col. pl., cuts. [Birds, pp. 69–86.]

Cazin, M. Développement de la couche cornée du gésier du poulet et des glandes qui la sécrètent. C.R. ci. pp. 1282–1284.

F.] [See also *Plotus melanogaster* (*Plotidæ*).]

HALMERS, J., & GILL, W. W. Work and Adventure in New Guinea: 1877 to 1885. London: 1885, 8vo, 342 pp., 21 pls., 2 maps. [Ch. xi., Birds of Paradise, pp. 245–249.]

CHAMBERLAIN, M. [See *Dendræca tigrina* (*Mniotiltidæ*).]

CHAPMAN, A. The Ornithology of Upper Coquetdale. Nat. 1885, pp. 150 & 151.

CHAPMAN, A. C. A Birds'-nesting Ramble in Lapland. Ibis, 1885, pp. 158–184.

A description of a month's residence [June] in East Finmark. [See *Pinicola enucleator* (*Fringillidæ*).]

——. On the Seasonal Changes of Plumage in Birds. Zool. 1885, pp. 220–223.

CHAPMAN, F. [See *Dinornis* sp.? (*Dinornithidæ*).]

CHRISTY, R. M. Notes on the Birds of Manitoba. Zool. 1885, pp. 121–133.

CLARKE, W. E. Observations of the Arrival of Summer Visitant Birds in the North of England in 1885. Nat. 1885, pp. 247–251.

——. [See also *Saxicola deserti* (*Turdidæ*).]

——, & BACKHOUSE, J. An Autumn Ramble in Eastern Iceland, with some Notes from the Faröes. Ibis, 1885, pp. 364–380, pl. ix. [See *Lagopus rupestris* (*Tetraonidæ*), pl.]

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The division of *Aves* followed is (i.) CARINATÆ [*Natatores*, *Grallatores*, *Gallinacei* = *Rasores*, *Columbinæ*, *Scansores*, *Passeres* (*Insessores*), *Raptatores*]; (ii.) RATITÆ [*Cursores* and others].

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——. [See also AGESBORG, G. S.]

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CORNISH, T. [See *Ægialitis vocifera* (*Charadriidæ*), *Totanus solitarius* (*Scolopacidæ*).]

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[Cory, C. B.] A List of the Birds of the West Indies, inc. Bahama Islands and the Greater and Lesser Antilles, exceptin[g] Islands of Tobago and Trinidad. Boston: 1885, 8vo, 34 pp.

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The classification is practically that of the Zool. Rec. inverted, but there are various alterations in the sequence of families, chiefly in the lower groups.

——. *Op. cit.* Vol. II. (1885), artt. *Certhiidæ*, Chat, Chickadee, Chuck-will's-widow, *Cœrebidæ*, Coot, Cormorant, *Corvidæ*, Courlan, Cow-bird, Crane, Crake, Creeper, Crossbill, Crow, Crow-blackbird, Cuckoo.

——. [See also Gurney, J. H., Jun.]

Crowfoot, W. M. [See *Anous stolidus*, *A. melanogenys*, *A. cinereus*, *Sterna fuliginosa*, *Gygis candida* (*Laridæ*), *Phaethon rubricauda* (*Phaethontidæ*), *Puffinus sphenurus*, *P. assimilis* (*Procellariidæ*), *Sula* [illegible] with *sonata* (*Pelecanidæ*).]

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, C.] Note sur l'éclosion des œufs de poule. Bull. Soc. Acclim. 1885, pp. 209–212.

——. Nouvelles recherches concernant l'influence des secousses sur le germe de l'œuf de la poule, pendant la période qui sépare la ponte de la mise en incubation. C.R. ci. pp. 834–836.

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Davison, W. [See *Micropternus* (*Picidæ*).]

Dixon, C. The Ornithology of St. Kilda. Ibis, 1885, pp. 69–97, pl. iii. [See *Troglodytes hirtensis* (*Troglodytidæ*), *Somateria spectabilis* (*Anatidæ*).]

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[See *Drepanornis cervinicauda*, *Phonygama purpureo-violacea*, sp. n., *Astrarchia stephaniæ*, *Paradisornis rudolphi*, gg. & spp. nn., *Diphyllodes*

est Indies inc.

hunsteini, sp. n., *Parotia lawesi*, ♀ n., *Lophorhina minor*, ♀ notiliæ... *ornis subalaris*, ♂ n. (pls.), *Epimachus meyeri*, *Paradisea finschi*, *Manucodia rubiensis*, *Diphyllodes jobiensis*, spp. nn. 19 species are given.

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A recapitulation, for the most part, of former lists by the author (with others). A few additions from small collections made in 1882–83 are included, and some statements corrected; while the native names are added where known. 479 species are given. [See *Corythaix livingstonii* (*Musophagidæ*).]

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Containing notes on Birds of the Keeling Is. (p. 44), of Sumatra (pp. 268–274), of Timor-Laut (pp. 355–368), of Buru (pp. 409 & 410). Figures are given of *Myzomela annabellæ* (frontis.), *Geocichla machiki*, *Piezorhynchus eastus* (bill), *Heteranax mundus* (bill), *Buceros* (head).

FORBES, W. A. [the late]. [See BEDDARD, F. E.]

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GILL, W. W. [See CHALMERS, J.]

GODMAN, F. D., & SALVIN, O. Biologia Centrali-Americana; or, Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America. London: 1885, 4to; Zoology, pt. xliii., *Aves*, pp. 345–360 [*Fringillidæ*, genera *Guiraca*, *Oryzoborus*, *Amaurospiza*, *Spermophila*, *Volatinia*, *Phonipara*]. [See *Volatinia splendens*, *V. jacarina*.] [*Cf.* Zool. Rec. xxi. *Aves*, p. 15.]

——, ——. [See also *Phonipara phæoptila* (*fumosa*, Lawr.?) (*Fringillidæ*).]

GOSS, N. S. [See *Elanoides forficatus*, *Ictinia subcærulea* (*Falconidæ*), *Vireo atricapillus* (*Vireonidæ*).]

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The species (all figured) are *Cacatua gymnopis*, *C. ducorpsi*, *Cyclopsitta occidentalis*, *Pristorhamphus versteri*, *Urocharis longicauda*, *Glycychæra fallax*, *Carpophaga rubricera*, *Ptilopus solomonensis*, *Halcyon tristrami*, *Pachycephala fuscoflava*, *Zosterops brunneicauda*, *Z. uropygialis*, *Myiagra fulciventris*, *Paradisea decora*, *Cacatua triton*, *C. ophthalmica*, *Edistoma pygmæum*, *Ptilotis albonotata*, *Rhamphocharis crassirostris*, *Euthyrhynchus flavigula*, *E. fuleigula*, *E. griseigula*, *Rhectes leucorhynchus*, *R. cerviniventris*, *Calornis gularis*, *Stigmatops chloris*.

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——. [See also WATERHOUSE, F. H.]

GRAFF, L. v. [See *Tetrao urogallus* (*Tetraonidæ*).]

GRANDIDIER, A. [See MILNE-EDWARDS, A.]

GREEN, J. R. [See *Collocalia nidifica* (*Cypselidæ*).]

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Besides seven cuts, a double plate is given of the two eggs in the Museum of Science and Art, Edinburgh [not previously figured], and a map of supposed distribution—both coloured.

GRUBER, J. G. [See ERSCH, J. S.]

GUILLEMARD, F. H. H. Report on the Collections of Birds made during the Voyage of the Yacht 'Marchesa.'—I. A Provisional List of the Birds inhabiting the Sulu Archipelago. [Important as noticing the sharp line of demarcation between the Bornean and Philippine Avifauna.] P. Z. S. 1885, pp. 247–275, pls. xvii. & xviii., map. (65 spp.) II. Borneo and the Island of Cagayan Sulu. *T. c.* pp. 414–420, pl. xxv. (114 and 15 spp.) III. Island of Sumbawa. *T. c.* pp. 501–511, pl. xxix. (38 spp.) IV. Celebes. *T. c.* pp. 542–561. (108 spp.) V. Moluccа Islands. *T. c.* pp. 561–576, pl. xxxiv. (69 spp.) VI. New Guinea and the Papuan Islands. *T. c.* pp. 615–665, pl. xxxix. (213 spp.)

[See *Tanygnathus burbidgei*, *Loriculus bonapartii*, *Eos insularis*, sp. n., pl. (*Psittaci*), *Iyngipicus ramsayi* (*Picidæ*), pl., *Artamides pollens*, *Pericrocotus marchesæ*, sp. n., pl. (*Campophagidæ*), *Chibia pectoralis* (*Dicruridæ*), *Oriolus chinensis* (*Oriolidæ*), *Macronus kettlewelli*, sp. n., pl., *Mixornis cagayanensis*, sp. n., pl. (*Timeliidæ*), *Sarcops calvus* (*Sturnidæ*), *Æthopyga siparaja* (*Nectariniidæ*), *Zosterops sumbavensis*, sp. n. (*Meliphagidæ*), *Pitta baudii* (*Pittidæ*), *Diphyllodes bruijni*, *Seleucides nigricans* (*Paradiseidæ*) and whole family, *Halcyon nigrocyanea*, *Sauromarptis gaudichaudi* (*Alcedinidæ*), *Eudynamis melanorhyncha* (*Cuculidæ*), *Turnix powelli*, sp. n., pl. (*Turnicidæ*), *Rallicula rubra*, pl. (*Rallidæ*), *Pernis celebensis* (*Falconidæ*).]

GURNEY, J. H. [See AYRES, T., *Ninox theomacha*, *N. maculata*, *Scops minutus* (*Striges*), *Micrastur jugularis*, *Urubitinga ridgwayi*, subspp. nn., *Baza ceylonensis* (*Falconidæ*).]

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HAAST, J. v. [See *Dinornis oweni*, sp. n. (*Dinornithidæ*).]

HANCOCK, J. [See *Xema sabinii* (*Laridæ*).]

HARGITT, E. [See *Picidæ*.]

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——. [See also *Syrnium uralense* (*Striges*).]

HARTING, J. E. [See *Tetrao tetrix* (*Tetraonidæ*).]

HARTLAUB, G. [See *Psittacula spengeli*, sp. n., pl., *P. cyanochlora* (*Psittaci*).]

HARTWIG, W. Zum Vogelzuge. J. f. O. 1885, pp. 427–452.

HARVIE-BROWN, J. A. Exhibition and Remarks upon a Specimen of *Larus kumlieni* (Brewster), from Cumberland Inlet, North America ; also Specimens of *Xema sabinii* (Sabine) and other Arctic Gulls. P. Phys. Soc. Edinb. 1883–85, pp. 301–305.

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F
BROWN, J. A.] On the Migration of Birds in the Spring and Autumn of 1848. Bull. U. S. Fish Comm. v. pp. 221–224.

The amount of food obtainable determines the movements of fishes, and these, again, the migration of birds, to a certain extent.

HEATHCOTE, F. G. [See CLAUS, C.]

HELLER, K. M. Eine für Syrien neue Vogelspecies. MT. orn. Ver. Wien, 1885, pp. 139, 146, & 147.

HENKE, K. G. [See *Tetrao albo-tetrix* (*Tetraonidæ*), *Anser ruficollis* (*Anatidæ*), pls.]

HENSHAW, H. W. List of Birds observed in Summer and Fall on the Upper Pecos River, New Mexico. Auk ii. pp. 326–333.

——. [See also *Lophortyx* (*Phasianidæ*), *Laridæ*, *Ceratorhina* (*Alcidæ*).]

HOFFMAN, W. J. Bird Names of the Selish, Pah-uta [Uta], and Shoshoni Indians. Auk, ii. pp. 7–10.

These tribes are in W. Montana, Nevada, Colorado, and Idaho respectively.

HOMEYER, A. v. [See *Turdus pilaris* (*Turdidæ*), *Locustella nævia*, *L. luscinioides*, *L. fluviatilis* (*Sylviidæ*).]

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——. Die "Ornis caucasica," von G. Radde. *T. c.* pp. 15–17.

——. [See also *Turdus pilaris* (*Turdidæ*), *Muscicapa semitorquata*, sp. n. (*Muscicapidæ*), pl.]

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HUDSON, W. H. [See *Homorus lophotes* (*unirufus*), *H gutturalis* (*Dendrocolaptidæ*).]

HULL, E. Mount Seir, Sinai, and Western Palestine. London: 1885, 8vo, xvi. & 227 pp., 24 pls., 2 col. maps.

For the few notices of Birds, see pp. 32, 63, 80, 91, & 93.

HUTTON, F. W. The Origin of the Fauna and Flora of New Zealand. Ann. N. H. xv. pp. 77–107. [Birds mentioned, pp. 93–107.]

JAMES, F. L. A Journey through the Somali Country to the Webbe Shebeyli. P. R. Geog. Soc. 1885, pp. 625–646. [Birds, p. 641; 7 new species, see SHELLEY, G. E.]

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Giving names in P. L. Sclater's list, in Santiago Mus., and local names.

JHERING, H. v. [See BERLEPSCH, H. v.]

JOHNSTON, H. H. [See SHELLEY, G. E.]

KADICH, H. v. Wanderskizzen aus Steiermark. MT. orn. Ver. Wien, 1885, pp. 3–6. [*Cf.* Zool. Rec. xxi. *Aves*, p. 19.]

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KELLER, F. C. Die Vogelwelt der kärtnerischen Alpen. Klagenfurt: 1884, 8vo, 66 pp.

——. [See *Tichodroma muraria* (*Certhiidæ*).]

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Containing a few unimportant notices of Birds.

KENNGOTT, A. [See FÖRSTER, W.]

KINGSLEY, J. S. The Standard Natural History. Vol. iv. Birds [by W. B. Barrows, D. G. Elliot, L. Stejneger, J. S. Kingsley]. Boston: 1885, 8vo, 558 pp., 25 pls., 273 cuts.

The most important work of the year, of which by far the greater portion is by STEJNEGER, viz.: pp. 1–195, 368–441, & 458–547; Elliot has contributed pp. 196–259 & 441–457; Barrows, pp. 260–348; and Kingsley, pp. 349–367.

THE CLASSIFICATION PROPOUNDED (with the Author's spelling) is:

Class IX. *AVES*.

Sub-class I. SAURURÆ.

Order I. ORNITHOPAPPI, pp. 21–23.

Sub-class II. ODONTOTORMÆ.

Order I. PTEROPAPPI, pp. 23–26.

Sub-class III. ODONTOHOLCÆ.

Order I. DROMÆOPAPPI, pp. 27–30.

Sub-class IV. EURHIPIDURÆ.

Super-order I. *DROMÆGNATHÆ*, pp. 31–55.

Order I. STRUTHIONES, p. 32.

Super-family. *STRUTHIOIDEÆ*, p. 33.

Family. STRUTHIONIDÆ } p. 33.
Genus. *Struthio*. }

Super-family. *RHEOIDEÆ*, p. 37.

Family. RHEIDÆ } p. 38.
Genus. *Rhea* }

Super-family. *CASUAROIDEÆ*, p. 39.

Family. DROMAIIDÆ } p. 40.
Genus. *Dromaius* }

Family. CASUARIDÆ . } p. 41.
Genus. *Casuarius* }
Super-family. *DINORNITHOIDEÆ*, p. 43.
Order II. ÆPIORNITHES, p. 47.
„ III. APTERYGES, p. 48.
„ IV. CRYPTURI, p. 51.
„ —. GASTORNITHES, p. 54.

Super-order II. *IMPENNES*, pp. 56–63.
Order V. PTILOPTERI . . } p. 58.
Family. SPHENISCIDÆ }

Super-order III. *EUORNITHES*, pp. 64–547.
Order VI. CECOMORPHÆ, p. 64.
Super-family. *COLYMBOIDEÆ*, p. 66.
Family. COLYMBIDÆ (= "PODICIPIDÆ"), p. 66.
Super-family. *HELIORNITHOIDEÆ* } p. 68.
Genus. *Heliornis* . . . }
Super-family. *ALCOIDEÆ*, p. 68.
Family. URINATORIDÆ, p. 68.
„ ALCIDÆ, p. 69.
Super-family. *LAROIDEÆ*, p. 74.
Family. STERCORARIIDÆ, p. 75.
„ LARIDÆ, p. 77.
Super-family. *PROCELLAROIDEÆ*, p. 84.
Family. DIOMEDIDÆ, p. 85.
„ PROCELLARIIDÆ, p. 88.
„ PELECANOIDIDÆ, p. 90.
Order VII. GRALLÆ, p. 91.
Super-family. *CHIONOIDEÆ*, p. 92.
Family. CHIONIDÆ, p. 92.
„ THINOCORIDÆ, p. 93.
Super-family. *SCOLOPACOIDEÆ*, p. 94.
Family. GLAREOLIDÆ, p. 95.
„ DROMADIDÆ, p. 97.
„ CHARADRIIDÆ, p. 98.
„ JACANIDÆ, p. 103.
„ SCOLOPACIDÆ, p. 105.
„ ŒDICNEMIDÆ, p. 112.
„ OTIDIDÆ, p. 113.
Su[illegible]mily. *EURYPYGOIDEÆ*, p. 115.
[illegible]amily. EURYPYGIDÆ, p. 116.
„ RHYNOCHET[illegible]Æ, p. 117.
„ MESITID[illegible], p. 119.
Super-family. *CARIAMOIDEÆ*, p. 119.
„ *GRUIOIDEÆ*, p. 121.
Family. PSOPHIIDÆ, p. 122.
„ GRUIDÆ, p. 123.
„ ? ARAMIDÆ ? p. 127.
„ RALLIDÆ, p. 127.

Order VIII. CHENOMORPHÆ, p. [illegible]
Super-family. *ANHIMOIDEÆ*, p. 132.
„ *ANATOIDEÆ*, p. 136.
Family. CNEMIORNITHIDÆ, p. 136.
„ ANSERANATIDÆ, p. 138.
„ PLECTROPTERIDÆ, p. 140.
„ ANATIDÆ, p. 141.
Super-family. *PHŒNICOPTEROIDEÆ*, p 153.
Family. PALÆOLODONTIDÆ, p. 154.
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[See *Hierofalco grebnitzkii*, sp. n., *H. uralensis*, *Aquila chrysaetos*, *A. nobilis*, *A. fulva daphanea*, *A. amurensis*, *A. orientalis*, *A. glitschii*, *A. clanga* var. *fulvescens* (*Falconidæ*), pls.]

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MURRAY, G. [See *Collocalia* (*Cypselidæ*).]

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NATION, W. [See *Petrochelidon ruficollis* (*Hirundinidæ*), *Psittacula andicola* (*Psittaci*), *Cypselus andicola* (*Cypselidæ*).]

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A second appendix [for the year 1884] to the author's above-mentioned work, of which pp. 588 & 589 are a first appendix. It includes an account of 17 species, errata, and the Georgian names of several birds.

——. [See also *Halcyon smyrnensis* (*Alcedinidæ*).]

RAMSAY, E. P. [See *Lophorina superba minor*, *Parotia lawesi* (*Paradiseidæ*), *Collyriocincla boweri* (*Laniidæ*), *Halcyon albonotata* (*Alcedinidæ*), *Pitta finschi* (*Pittidæ*), spp. nn.]

REICHENOW, A. Handwörterbuch der Zoologie, Anthropologie und Ethnologie. Bd. iii. Breslau: 1885, 8vo, pp. 1–639, map of Zoological Regions, cuts; Elopini—Haliotis.

——. [See also FÖRSTER, W.; *Rhipidura atrigularis* (*Muscicapidæ*), *Corvus kubaryi* (*Corvidæ*), *Phlegœnas virgo* (*Columbidæ*), *Parus pallidiventris* (*Paridæ*), *Euplectes ladoënsis*, *Textor bochmi* and family (*Ploceidæ*), spp. nn.]

——, & SCHALOW, H. Compendium der neu beschriebenen Gattungen und Arten. Series viii. (1883). J. f. O. 1885, pp. 452–463. [*Cf.* Zool. Rec. xxi. *Aves*, p. 26.]

REID, S. G. Winter Notes from Morocco. Ibis, 1885, pp. 241–255.

[See *Turdus viscivorus* (*Turdidæ*), *Ruticilla moussieri* (*Sylviidæ*), *Sitta cæsia* (*Sittidæ*), *Fringilla cælebs* (*Fringillidæ*), *Garrulus glandarius* (*Corvidæ*), *Asio otus* (*Striges*).]

REISCHEK, A. Ornithologische Beobachtungen aus Neu-Seeland. MT. orn. Ver. Wien, 1885, pp. 197–199, 209–211, 221, & 222.

——. Notes on New Zealand Ornithology. Tr. N. Z. Inst. xvii. [1884] pp. 187–197.

[See *Apteryx* (*Apterygidæ*), *Eudyptes*, *Eudyptida* (*Spheniscidæ*), *Nestor*, *Stringops* (*Psittaci*).]

REISER, O. [See *Corvus corax* (*Corvidæ*).]

RIDGWAY, R. Description of some New Species of Birds from Cozumel I., Yucatan. P. Biol. Soc. Wash. iii. 4 pp. [See next paper.]

——. Catalogue of a Collection of Birds made on the Island of Cozumel, Yucatan, by the Naturalists of the U. S. Fish Commission Steamer 'Albatross.' P. U. S. Nat. Mus. viii. pp. 560–583 [with a comparative table of species].

[See SALVIN, O.; *Harporhynchus guttatus* (*Turdidæ*), *Troglodytes beani* (*Troglodytidæ*), *Dendrœca petechia ruficertex* (*Mniotiltidæ*), *Vireo cinereus*, *V. bairdi*, *Cyclorhis insularis* (*Vireonidæ*), *Spindalis benedicti* (*Tanagridæ*), *Euetheia olivacea intermedia*, *Cardinalis cardinalis saturatus* (*Fringillidæ*), *Myiarchus platyrhynchus*, *Empidonax gracilis* (*Tyrannidæ*), *Attila cozumelæ* (*Cotingidæ*), *Lampornis prevosti thalassinus*, *Chloro-*

stilbon forficatus (*Trochilidæ*), *Centurus dubius leei*, *C. rubriventris pygmæus* (*Picidæ*), *Rupornis magnirostris gracilis* (*Falconidæ*), spp. & subspp. nn., *Certhiola caboti* (*Cœrebidæ*).]

[Ridgway, R.] Report on Bird Collection of U. S. Nat. Museum. Ann. Rep. Smithsonian Inst. 1883, pp. 220–225.

——. Some Emended Names of North American Birds. P. U. S. Nat. Mus. viii. pp. 354–356.

——. [See also *Granatellus sallæi boucardi*, *Dendroica petechia ruficertex*, *D. bryanti castaneiceps*, subspp. nn., *Helminthophila leucobronchialis*, &c. (*Mniotiltidæ*), *Vireolanius pulchellus verticalis*, subsp. n. (*Vireonidæ*), *Certhiola finschi*, *C. sundevalli*, *C. sanctithomæ*, spp. nn. and gen. (*Cœrebidæ*), *Cardinalis cardinalis superbus*, *Junco cinereus palliatus*, subspp. nn., *Peucæa mexicana* (*Fringillidæ*), *Icterus cucullatus* (*Icteridæ*), *Cyanocorax cucullatus*, sp. n. (*Corvidæ*), *Contopus pileatus*, *Empidonax viridescens*, spp. nn. (*Tyrannidæ*), *Pittasoma michleri zeledoni*, subsp. n., *Grallaria intermedia*, sp. n. (*Formicariidæ*), *Dromococcyx gracilis*, sp. n. (*Cuculidæ*), *Cathartes burrovianus* and *C. urubitinga*, *Pseudogryphus californianus*, *Sarcorhamphus aquatorialis* (*Cathartidæ*), *Rupornis gracilis*, sp. n., *Onychotes gruberi*, *Buteo oxypterus*, *B. harlani* (*Falconidæ*), *Cancroma zeledoni*, sp. n. (*Ardeidæ*), *Anser leucoparcius* (*Anatidæ*), *Pelagodroma marina*, *Œstrelata fisheri*, *Œ. defilippiana* (*Procellariidæ*).]

Roberts, G. Topography and Natural History of Lofthouse and its Neighbourhood; with the Diary of a Naturalist and Rural Notes. Leeds: 1885, 12mo, Vol. ii. pp. i.–viii. & 1–258, 2 pls. [Birds, pp. 19–27, 189–193, &c.].

Rochas, F. Des nerfs qui ont été appelés vidiens, chez les Oiseaux. C.R. ci. pp. 573–575.

Rogeron, G. Croisements de Canards. Bull. Soc. Acclim. 1885, pp. 401–406. [*Cf.* Zool. Rec. xxi. *Aves*, p. 27.]

[See also *Tadorna variegata* (*Anatidæ*).]

Rosenberg [Baron]. Die Paradiesvögel und ihre Verwandten. MT. orn. Ver. Wien, 1885, pp. 17, 18, 30, 31, 39, 40, 53, & 54.

Notes (after Musschenbroek) on the *Paradiseidæ*, *Sturnidæ*, *Manucodidæ*, *Upupidæ*, *Epimachidæ*, *Falculiidæ*, *Oriolidæ*, *Ptilonorhynchidæ*.

——. Zu Musschenbroek's Abhandlung "Die Paradiesvögel und ihre Verwandten." *T. c.* p. 298.

Russ, K. Die fremlandischen Stübenvögel, ihre Naturgeschichte, Pflege und Zucht. Vol. iv. pt. 6, pp. 545–656. Magdeburg: 1884, 8vo. [*Cf.* Zool. Rec. xxi. *Aves*, p. 27.]

Russell, C. [See Gurney, J. H., Jun.]

Sala, C. F. [the late]. [See Büttikofer, J.]

Salvadori, T., & Giglioli, E. [See *Cissa hypoleuca* (*Corvidæ*), *Mirafra erythrocephala* (*Alaudidæ*), *Iyngipicus frater*, *I. wattersi* (*Picidæ*).]

Salvin, O. On a Collection of Birds from the Island of Cozumel. Ibis, 1885, pp. 185–194, pl. v. [*Cf. t. c.* pp. 321 & 327; also Ridgway, R.]

This island is ten miles from the coast of Yucatan; and while there is a distinct resemblance to the avifauna of that country, many species are not identical and 2 are new. [See *Harporhynchus melanostoma*, sp. n. (*Turdidæ*), *Spindalis exsul*, sp. n. (*Tanagridæ*), pl., *Hadrostomus* sp.? (*Cotingidæ*), *Engyptila gaumeri* (*Columbidæ*).]

——. A List of the Birds obtained by Mr. Henry Whitely in British Guiana. *T. c.* pp. 195–219, 291–306, & 418–439, pl. viii.

The specimens were the result of five years' collecting on and near the Essequibo and Mazaruni rivers, and the Roraima and Merumé Mts. The list is collated with that of Schomburgk [Reisen in British Guiana], the only former authority (1840–1844). [See *Turdus murinus*, sp. n. (*Turdidæ*), *Thryothorus rufulus* (*Troglodytidæ*), *Setophaga verticalis* (*Mniotiltidæ*), *Euphonia plumbea*, *Tachyphonus intercedens* (*Tanagridæ*), *Volatinia splendens*, *Phonipara phæoptila*, *Catamenia* sp.? (*Fringillidæ*), *Elainea ruficeps*, *Pitangus parvus*, *Empidochanes pæciturus* (*Tyrannidæ*), *Pachyrhamphus griseigularis*, pl., *Aulia hypopyrrha*, *Iodopleura leucopygia*, sp. n., *Pyroderus scutatus* (*Cotingidæ*), *Sclerurus caudacutus* (*Dendrocolaptidæ*), *Herpsilochmus* sp.?, *H. stictarus*, sp. n., *Heteronemis leucostigma*, *H. saturata*, sp. n., *Formicarius cayennensis* (*Formicariidæ*), *Campylopterus hyperythrus*, *Discura* sp.?, *Trochilus* spp. (*Trochilidæ*), *Chætura zonaris* (*Cypselidæ*), *Antrostomus whitelyi*, sp. n. (*Caprimulgidæ*).]

——. [See Godman, F. D.]

Saunders, H. A History of British Birds by the late William Yarrell. Fourth edition. Pts. xxvii.–xxx. (completing the work), pp. 241–531, errata, title-pages to the four volumes, and introduction. London: 1885, 8vo. [*Cf.* Zool. Rec. xxi. *Aves*, p. 28.]

These parts conclude *Platalæidæ* and treat of *Phœnicopteridæ*, *Anatidæ*. *Phœnicopterus roseus* and *Chen hyperboreus* are added to the British Lists and figured [in the text], as well as *Saxicola stapazina*, *S. deserti*, *Acrocephalus palustris*, *Sylvia nisoria*, *Tichodroma muraria*, *Acanthyllis caudacuta*, *Caprimulgus ruficollis*, *C. ægyptius*, *Ægialitis vocifera*, *Totanus solitarius*, *Colymbus adamsi* [in the introduction].

Schalow, H. Zur Ornis der Mark Brandenburg. Z. ges. Orn. 1885, pp. 1–44. [267 species]

The author gives an account of the Birds of the division, with their vernacular names, and mentions the chief collections; he also gives a table of comparative occurrence of species in various districts. [See *Acanthis albigularis*, *Pyrrhula major* (*Fringillidæ*), *Cuculus canorus* (*Cuculidæ*), *Bubulcus ibis* (*Ardeidæ*), *Otis tetrax* (*Otididæ*).]

——. [See also Reichenow, A., *Musophaga bochmi* (*Musophagidæ*).]

Schenk, — . [See Förster, W.]

Schiavuzzi, B. Osservazioni fenologiche e sui Passagi degli Uccelli nel Litorale Austriaco durante l'anno 1884. Z. ges. Orn. 1885, pp. 52–61, pl. v.

[Schiavuzzi, B.] [See also *Anas boscas* (*Anatidæ*), var.].

Schlömilch, —. [See Förster, W.]

Schmidt, A. [See *Syrnium uralense* (*Striges*).]

Sclater, P. L. [See *Chasiempis sandwichensis* and genus (*Muscicapidæ*), *Calliste gouldi*, sp. n., *Euphonia purpurea*, *Phœnicothraupis rhodinolæma*, *Lanio lawrencii*, sp. n. (= *Tachyphonus atricapillus*, Lawr.), pl., *Tachyphonus napensis*, *T. nattereri*, pl., *Nesospingus* (*Chlorospingus*) *speculiferus*, cut, *Chlorospingus* (*Buarremon*) *flavo-virens*, *Buarremon sordidus*, *B. albiceps*, *B. nationi* (= *Pipilo mystacalis*) (*Tanagridæ*), *Icterus hauxwelli*, sp. n. (*Icteridæ*), *Cyanopolius cyaneus* (*Corvidæ*), *Phasianus principalis*, sp. n. (*Phasianidæ*), pl., *Rhea darwini*, *R. macrorhyncha* (*Rheidæ*).]

Scott, W. E. D. Winter Mountain Notes from Southern Arizona. Auk, ii. pp. 172–174.

——. Early Spring Notes from the Mountains of Southern Arizona. *T. c.* pp. 348–356.

Both papers refer to the same locality, Las Sierras de Sta. Catalina.

[See *Troglodytes aedon marianæ*, subsp. n. (*Troglodytidæ*), *Junco cinereus palliatus*, new geogr. race (*Fringillidæ*).]

——. [See also *Icterus parisorum*, *I. cucullatus* (*Icteridæ*), *Phainopepla nitens* (*Ampelidæ*), *Vireo vicinior* (*Vireonidæ*).]

Sedgwick, A. [See Claus, C.]

Seebohm, H. A History of British Birds, with Coloured Illustrations of their Eggs. London : 1885, 8vo, pts. v. & vi., vol. iii., pp. 1–684, pls. xxxi. & xlvi.–lxviii. Also pp. i.–xxiv., introduction, list of plates (pp. 1–18), appendix, indices.

These parts contain *Charadriidæ* (including *Scolopacidæ*), *Laridæ*, *Alcidæ*, *Colymbidæ*, *Procellariidæ*, *Podicipedidæ*, *Anatidæ*, and *Pelecanidæ*. Of special interest are *Charadrius fulcus* and *C. major* (race), *Totanus solitarius*, *Tringa pectoralis* (of which the eggs are figured for the first time), *Colymbus adamsi*, *Chen hyperboreus*, *Troglodytes hirtensis*.

——. Further Contributions to the Ornithology of Japan. Ibis, 1885, pp. 363 & 364. [*Cf.* Zool. Rec. xxi. *Aves*, p. 29.]

[See *Totanus calidris* (*Scolopacidæ*).]

——. The Nests and Eggs of Birds. Tr. Hertf. Soc. iii. pp. 255–260.

——. [See also *Phalacrocorax filamentosus* (*capillatus*), *P. pelagicus* (*avolus*, *bicristatus*?) (*Phalacrocoracidæ*), *Colymbus* (*Colymbidæ*).]

Seeley, H. G. [See Phillips, J.]

Seton, E. E. T. Manitoban Notes. Auk, ii. pp. 21–24. [*Striges*, *Falconidæ*, *Fringillidæ*.]

——. Notes on Manitoban Birds. *T. c.* pp. 267–271.

[See *Bonasa umbellus umbelloides*, var. n.? (*Tetraonidæ*).]

——. Interesting Records from Toronto, Canada. *T. c.* pp. 334–337.

——. [See also *Vireo philadelphicus* (*Vireonidæ*).]

Sharpe, R. B. Catalogue of the Passeriformes, or Perching Birds, in the Collection of the British Museum; Fringilliformes: Part i., containing the Families *Dicæidæ*, *Hirundinidæ*, *Ampelidæ*, *Mniotiltidæ*, and *Motacillidæ*; Vol. x. of series. [See Zool. Rec. xxi. *Aves*, p. 14.] London: 1885, 8vo, xiii. & 682 pp., pls. i.–xii.

The following new genera are constituted: *Pinaroloxias* [type, *Cactornis* (*Loxops*) *inornata*], *Xanthocorys* [type, *Anthus correndera* (*nattereri*)], *Oreocorys* [type, *Heterura* (*Anthus*) *sylvana*]. The new species [2 only renamed] are *Basileuterus roraimæ*, *B. auricularis*, and *B. meridanus* (formerly *B. bivittatus*, pts.), *B. bolivianus* (formerly *B. mesoleucus*, pt.), *Polioptila lactea*, *P. parvirostris*, *P. sclateri* (formerly *P. nigriceps*, pt.), *Motacilla grandis* (*M. japonica*), *M. xanthophrys* (formerly *M. melanocephala*, pt.), *Anthus nilghiriensis* (*A. montanus*), *A. nicholsoni* [*cf.* Layard's Birds S. Afr. p. 536 (1884).] The new subspecies are *A. pallidiventris* (of *A. gouldi*), *Cotile shelleyi* (of *C. riparia*), *Dendræca granadensis* (of *D. vicilloti*), *Basileuterus veraguensis* (of *B. leucopygius*), *Setophaga guatemalæ* (of *S. picta*), *Petrochelidon timoriensis* (of *P. nigricans*); *q.v.* in special part.

——. [See also Gould, J.; *Anthracoceros lemprieri*, sp. n. (*Bucerotidæ*).]

——, & Wyatt, C. W. A Monograph of the *Hirundinidæ*; or Family of Swallows. London: 1885, 4to, pt. i. pp. 1–10, 6 pls.; pt. ii., pp. disc., 6 pls.

The species figured are *Hirundo semirufa*, *H. leucosoma*, *H. lucida*, *H. angolensis*, *H. striolata*, *H. senegalensis*, *H. æthiopica*, *H. domicella*, *Chelidon dasypus*, *C. urbica*, juv., *Cotile fuligula*, *Psalidoprocne obscura*.

Shaw, G. A. Madagascar and France, with some Account of the Island, its People, its Resources and Development. London: 1885, 8vo, 320 pp., 17 pls., map. [Birds, pp. 264–272.]

Shelley, G. E. On a Collection of Birds made by Mr. H. H. Johnston in the Kilima-njaro District; with Field Notes by Mr. H. H. Johnston. P. Z. S. 1885, pp. 222–230, pls. xiii. & xiv.

[See *Pinarochroa hypospodia* (*Sylviidæ*), pl., *Nectarinia johnstoni*, pl., *Cinnyris mediocris* (*Nectariniidæ*), spp. nn. (50 species). *Cf.* Zool. Rec. xxi. *Aves*, p. 31.]

——. On Mr. E. Lort Phillips's Collection of Birds from Somali-land. Ibis, 1885, pp. 389–418, pls. x.–xii.

Descriptions and notes on the breeding and habits of 62 species from the plateau of Somali-land and the Haynes River. Besides more than 30 new to this district, 6 species and 1 subspecies are new to science. [See *Argya aylmeri* (*Timeliidæ*), *Saxicola phillipsi*, spp. nn. (*Turdidæ*), pls., *Parus thruppi*, sp. n. (*Paridæ*), pl., *Dryoscopus ruficeps*, *Telephonus jamesi*, spp. nn., pls, *Lanius dorsalis* (*Laniidæ*), *Uraginthus ianthinogaster* (*Ploceidæ*), *Mirafra cordofanica*? (*Alaudidæ*), *Irrisor erythrorhynchus*, *Rhinopomastes cabanisi* (*Irrisoridæ*), *Coracias lorti*, sp. n., *C. nævia levaillanti*, subsp. n.? (*Coraciidæ*), *Trachyphonus erythrocephalus*, *Tricholæma stigmatothorax* (*Capitonidæ*), *Carine glaux* (*Striges*), *Pæocephalus rufiventris* (*Psittaci*), *Cursorius gallicus somalensis*, subsp. n. (*Charadriidæ*).]

[SHELLEY, G. E.] [See also *Coliidæ*.]

SHUFELDT, R. W. Contribution to the Comparative Osteology of the *Trochilidæ*, *Caprimulgidæ*, and *Cypselidæ*. P. Z. S. 1885, pp. 886-915, pls. lviii.-lxi.

Careful description of many genera, but rather startling conclusions. Establishment of a group, *Caprimulgi*, containing all the typical Caprimulgine forms, as well as *Nyctibius*, *Steatornis*, *Podargus*, *Psalurus*. Through *Podargus* they are related to the Owls [this is not new]. The Swifts are "essentially modified Swallows," "and belong to the order *Passeres*;" the *Trochili* "are fully entitled to form an order by themselves."

——. [See also *Phalænoptilus nuttalli* (*Caprimulgidæ*), *Geococcyx californicus* (*Cuculidæ*), pl., *Diomedea brachyura* (*Procellariidæ*).]

SLATER, H. H. [See *Myiophoneus borneensis*, sp. n. ? (*Turdidæ*), *Parus cinerascens*, sp. n. (*Paridæ*).]

SMITH, CECIL. Wayside Notes during a West Country Drive. Zool. 1885, pp. 3-11.

Notes on ornithology in Devon and Cornwall.

SMITH, W. W. [See *Dinornis* (*Dinornithidæ*).]

SNELLEMAN, J. F. Zoogdieren en Vogels [in P. J. Veth's "Midden-Sumatra." Natuurlijke Historie. Eerste Afdeeling], pp. 30–52, pls. i.–iv. [*Cf.* Zool. Rec. xx. *Aves*, p. 16.]

Figures are given of *Arachnothera concolor* (*Nectariniidæ*), *Rhipidura vidua* (*Muscicapidæ*), *Peloperdix rubrirostris* (*Phasianidæ*), *Treron nasica* (*Columbidæ*), as are also the native names of the species.

STANLEY, H. M. The Congo and the Founding of its Free State: a Story of Work and Exploration. London: 1885, 8vo, 2 vols., xxvii., 528, x., & 483 pp., 24 & 20 pls., 5 coloured maps, 78 cuts, append.

A very few notes on Birds.

STEJNEGER, L. Classification of Birds. Sci. Rec. ii. pp. 154 & 155. [See also KINGSLEY, J. S.]

——. Results of Ornithological Explorations in the Commander Islands and in Kamtschatka. Bull. No. 29. U. S. Nat. Mus. Washington: 1885, 8vo, 382 pp., 8 pls., map, 7 cuts.

The plates are heads of *Lunda cirrhata*, *Fratercula corniculata*, *Simorhynchus pygmæus*, *S. pusillus*, *S. cristatellus*, *Cyclorrhynchus psittaculus*, *Synthliborhamphus antiquus*, *Fulmarus glacialis glupischa*, *Larus schistisagus*, *L. kamtschatchensis*, *Anser segetum middendorffi*, *A. albifrons gambeli*, *Somateria v-nigrum*, *Phalacrocorax pelagicus*, *P. urile*. [See *Phalacrocorax perspicillatus* (*Phalacrocoracidæ*).]

——. Notes on some apparently preoccupied Ornithological Generic Names. P. U. S. Nat. Mus. viii. pp. 409 & 410.

[See *Harelda* (*Anatidæ*), *Canace* (*Tetraonidæ*).]

[Stejneger, L.] Analecta Ornithologica. Fourth Series; Auk, ii. pp. 43–52; Fifth Series, pp. 178–188; Sixth Series, pp. 337–343. [*Cf.* Zool. Rec. xxi. *Aves*, p. 32.]

Containing discussions on (xvii.) derivation of *Quiscalus* and *Quiscula*; (xviii.) substitution of *Colinus* for *Ortyx*; (xix.) of *Cyrtonyx montezumæ* for *Ortyx massena*; (xx.) of *Cyanolesbia* for *Cynanthus*; (xxi.) of *Sporophila* for *Spermophila*, *Euetheia* for *Phonipara*, *Euetheia bicolor* for *E. zena*, *Calamospiza melanocorys* for *Fringilla bicolor* of Townsend; (xxii.) *Molothrus ater* for *M. pecoris*; (xxiii.) *Sayornis phœbe* for (*S.*) *fusca*; (xxiv.) *Ceophloeus* for *Hylotomus*; (xxv.) *Chordeiles virginianus* for *C. popetue*; (xxvi.) *Crymophilus* for *Phalaropus*, and the latter for *Lobipes*; (xxvii.) *Megascops* for *Scops*; (xxviii.) On Gyrfalcons [specific names]; (xxix.) *Jacana* for *Parra*; (xxx.) *Colymbus nigricollis* not a North American bird; (xxxi.) *Simorhynchus* of Merrem, 1819; (xxxii.) *Dendræca vigorsi* for *Sylvia pinus*.

——. [See also *Lanius robustus* (*Laniidæ*), *Passer saturatus*, sp. n. (*Fringillidæ*).]

Stephens, F. Notes of an Ornithological Trip in Arizona and Sonora. Auk, ii. pp. 225–231. [See Brewster, W.]

Stevenson, H. Ornithological Notes from Norfolk. Zool. 1885, pp. 321–332.

Stolzmann, J. Quelques remarques sur le Dimorphisme Sexuel. P. Z. S. 1885, pp. 421–432.

The examples are all taken from Birds.

Strasser, H. Ueber den Flug der Vögel. Jen. Z. Nat. ix. pp. 175–327 & 329–429.

Chiefly considered from a mathematical point of view.

Sutton, J. B. Diseases of the Reproductive Organs in Frogs, Birds, and Mammals. J. Anat. Phys. xix. pp. 121–143, pl. viii. [Birds, pp. 131–138.]

Svertschkoff, A. v. Das Tierleben in Ceylon. Zool. Gart. 1885, pp. 129–134. [Birds, pp. 131–133.]

Swinhoe, C., & Barnes, H. On the Birds of Central India. Pt. i. Ibis, 1885, pp. 52–69. [See *Siphia tickelliæ* (*Muscicapidæ*).] Pt. ii. *T. c.* pp. 124–138.

The writers worked the district around Mhow and Neemuch, and record 256 species.

Wo[illegible]ikla, G. [See *Nucifraga caryocatactes* (*Corvidæ*).]

Taczanowski, L. [See *Anæretes nigricristatus*, *Myopatis wagæ*, spp. nn. (*Tyrannidæ*).]

——, & Berlepsch, H. v. Troisième liste des Oiseaux recueillis par M. Stolzmann dans l'Ecuadeur. P. Z. S. 1885, pp. 67–124, pls. vii. & viii. [*Cf.* Zool. Rec. xxi. *Aves*, p. 4.] 290 species.

Two appendices are added, in the second of which are several important corrections. [See also *Odontorhynchus branickii* (*Troglodytidæ*),

Calliste pulchra aequatorialis, *C. taylori*, *Poecilothraupis palpebrosa caerulescens*, *Chlorospingus signatus* (*Tanagridæ*), *Pogonotriccus gualaquizæ*, *Myiobius phœnicomitra* (*Tyrannidæ*), *Synallaxis singularis*, *Anabazenops mentalis*, *Xiphocolaptes crassirostris* (*Dendrocolaptidæ*), *Dysithamnus leucostictus*, *Formicarius thoracicus* (*Formicariidæ*), *Galbula pastazæ* (*Galbulidæ*), spp. nn. Also *Urothraupis stolzmanni* (*Tanagridæ*), *Pseudotriccus pelzelni* (*Tyrannidæ*), gg. & spp. nn.]

Tait, W. As Aves en Portugal. Rev. Soc. Porto, iii. pp. 459 & 519; iv. p. 80.

Talský, J. Eine ornithologische Localsammlung auf Schloss Pernstein in Mähren. MT. orn. Ver. Wien, 1885, pp. 29, 30, 38, 39, 52, 53, 67, 68, 81, 82, 97–99, 113, & 114.

An account of the Moravian collection of W. v. Mittrowsky.

——. Die Raubvögel Mährens. Z. ges. Orn. 1885, pp. 73–93.

Intended for a companion paper to "Die Raubvögel Ungarns" [*cf.* Zool. Rec. xxi. *Aves*, p. 20]. 36 species are given.

——. [See also *Stercorarius* (*Laridæ*).]

Taschenberg, O. Zur Frage über die Entstehung der Färbung der Vogeleischalen. Zool. Anz. viii. pp. 243–245.

Traquair, R. H. President's Address to the Royal Physical Society of Edinburgh. [Remarks on Biological Nomenclature.] P. Phys. Soc. Edinb. viii. (Session 1884–5), pp. 275–295.

Tristram, H. B. On a small Collection of Birds from Korea. Ibis, 1885, pp. 194 & 195. [8 species.]

[See *Nemoricola indica* (*Motacillidæ*).]

——. [See also *Platycercus pennanti* var. n. ? *nobbsi* (*Psittaci*), *Halcyon norfolkiensis*, sp. n. (*Alcedinidæ*).]

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[See *Brachypteryx salaccensis*, sp. n. (*Timeliidæ*).]

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WALTER, A. [See *Cuculus canorus* (*Cuculidæ*), *Picus medius* (*Picidæ*), *Falco subbuteo* (*Falconidæ*).]

WARD, M. F. [See PITTIER, H.]

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[See *Sitta whiteheadi* (*Sittidæ*).]

WIEBKE, A. & P. M. [See *Tetraonidæ*.]

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ZELEDON, J. C. Catalogue of the Birds of Costa Rica, in[illegible] *singularis*,
species of which the United States National Museum specimens from that country. P. U. S. Nat. Mus. viii. pp. 104–118.

ZEIMER, E. [See MATSCHIE, P.]

CARINATÆ.

PASSERES.

(As different ideas prevail as to the sequence of families, they are here arranged alphabetically under their respective sub-orders.)

OLIGOMYODI.

COTINGIDÆ.

Attila cozumelæ, sp. n. [= *Attila* sp.?, Salvin, Ibis, 1885, p. 191] Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 572 & 573 [also P. Biol. Soc. Wash. iii.]. *A. griseigularis*, sp. n., near *A. cinereus*, Sta. Catharina, Brazil (?); H. v. Berlepsch, Ibis, 1885, p. 290.

Aulia hypopyrrha (Vieill.), from B. Guiana, is perhaps distinct from *A. sibilatrix* (Wied.), of Brazil; O. Salvin, *t. c.* p. 303.

Chasmorhynchus nudicollis, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxiii.

Hadrostomus sp.? from I. of Cozumel, Yucatan; O. Salvin, Ibis, 1885, p. 191.

Iodopleura leucopygia, sp. n., very near *I. pipra*, for which it was taken by Cabanis [in Schomburgk's Guiana]; the two specimens, no doubt, are from B. Guiana; *id. t. c.* p. 305.

Pachyrhamphus griseigularis, ♂ and ♀ diagnosed; *id. t. c.* p. 302, pl. viii.

Pyroderus scutatus (*Threnœdus rubricollis*, Cab., in Schom. Guiana) prob. = *P. orenocensis*; *id. t. c.* p. 306.

PITTIDÆ.

Pitta fig.; A. Newton, Encycl. Brit. ed. 9, xix. *P. baudii*, do the sexes differ in plumage?; F. H. H. Guillemard, P. Z. S. 1885, p. [illegible] *P.* (*Erythropitta*) *finschi*, sp. n., Astrolabe Mts., New Guinea; E. [illegible] Ramsay, P. Linn. Soc. N. S. W. ix. p. 864. *P. mackloti*, description [illegible] egg from Waigiu; A. Nehrkorn, J. f. O. 1885, p. 33.

TYRANNIDÆ.

Anærctes nigricristatus, sp. n., Stolzm., MSS., Chota, Peru; L. Taczanowski, Orn. du Pérou, ii. p. 555 [1884].

Contopus depressirostris, Ridg., MS., sp. n., Los Sábalos, Nicaragua;

...ing, P. U. S. Nat. Mus. vi. [1883] p. 403. *C. pileatus*, sp. n., ...cert.; R. Ridgway, *op. cit.* viii. p. 21.

Elainea ruficeps from B. Guiana; O. Salvin, Ibis, 1885, p. 294.

Empidochanes pœcilurus, does the colouration of the outer rectrices differ in the sexes? *id. t. c.* p. 298.

Empidonax gracilis, sp. n. (= *E. minimus*?), Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 571 & 572 [also P. Biol. Soc. Wash. iii.]. *E. viridescens*, sp. n., Cervantes, Costa Rica; *id. op. cit.* vi. p. 413 [1883].

Myiarchus platyrhynchus, sp. n., Cozumel I., Yucatan; *id. op. cit.* viii. pp. 570 & 571 [also P. Biol. Soc. Wash. iii.].

Myiobius phœnicomitra, sp. n., Stolzm., MS., Mapoto, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, pp. 91 & 92.

Myopatis wagæ, sp. n., Chirimoto, Peru; L. Taczanowski, Orn. du Pérou, ii. p. 253 [1884].

Ochthœca consobrina, sp. n., Bogota, in New Granada; H. v. Berlepsch, Ibis, 1885, p. 289.

Pitangus parvus from B. Guiana; O. Salvin, *t. c.* p. 296.

Pogonotriccus gualaquizæ, Scl., MS., sp. n., Mapoto, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 89.

Pseudotriccus pelzelni, g. & sp. nn., Machay and Mapoto, Ecuador; *iid. t. c.* p. 88.

TRACHEOPHONÆ.

Dendrocolaptidæ.

Anabazenops mentalis, sp. n., Stolz., MS., Machay, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, pp. 96 & 97.

Cinclodes fuscus new to Brazil; H. v. Berlepsch & H. v. Jhering, Z. ges. Orn. 1885, p. 109.

Homorus gutturalis in the Argentine Republic, similarity of habits in *Synallaxis patagonica*; W. H. Hudson, Ibis, 1885, pp. 284–286. *H. lophotes* (= *H. unirufus*, d'Orb. & Lafr., *nec Anumbius unirufus*, d'Orb. "Voyage") in the Argentine Republic, its habits; *id. t. c.* pp. 283 & 284.

Sclerurus caudacutus (Vieill.) from B. Guiana, it is a distinct species; O. Salvin, *t. c.* p. 419.

Synallaxis singularis, sp. n., Mapoto, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 96, pl. vii. fig. 2.

Xiphocolaptes crassirostris, sp. n., Palmal, Ecuador; *iid. t. c.* pp. 113 114.

Formicariidæ.

Cymbilanius lineatus fasciatus, subsp. n., Los Sábalos, Nicaragua; C. C. Nutting, P. U. S. Nat. Mus, vi. [1883] p. 404.

Dysithamnus leucostictus, ♂ described from Machay, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 99.

Formicarius cayennensis, does it occur in Guiana, as Buffon asserts?

O. Salvin, Ibis, 1885, p. 429. *F. thoracicus*, sp. n., Stolz., M. [illegible] Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 10[illegible].

Grallaria intermedia, sp. n., Costa Rica; R. Ridgway, P. U. S. Nat. Mus. vi. [1883] p. 406, note.

Herpsilochmus stictirus, sp. n., near *H. pileatus*, of Brazil, B. Guiana [Bartica Grove and Camacusa]; O. Salvin, Ibis, 1885, p. 424. *H.* sp. ?, near *H. dorsimaculatus*, B. Guiana; *id. t. c.* p. 425.

Heterocnemis leucostigma from B. Guiana (= *H. simplex*, Scl.); *id. t. c.* p. 427. *H. saturata*, sp. n., near *H. leucostigma*, ♀ ♂, B. Guiana [Roraima]; *id. ibid.*

Pittasoma michleri zeledoni, subsp. n., from Rio Sucio, Costa Rica; R. Ridgway, P. U. S. Nat. Mus. vi. p. 414 [1883].

ACROMYODI.

PSEUDOSCINES.

MENURIDÆ.

Menura superba, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxvi.

OSCINES.

ALAUDIDÆ.

Mirafra cordofanica? differing somewhat from the type, Somali-land; G. E. Shelley, Ibis, 1885, pp. 407 & 408. *M. erythrocephala*, sp. n., Thu-Duc, &c., Cochin China; T. Salvadori & E. Giglioli, Atti Acc. Tor. xx. p. 429 [collected in 1866].

AMPELIDÆ.

Phainopepla nitens, its breeding habits in Arizona; W. E. D. Scott, Auk, ii. pp. 242–246.

CAMPOPHAGIDÆ.

Artamides pollens, Lapac I., Sulu Archipelago; F. H. H. Guillemard, P. Z. S. 1885, p. 258.

Graucalus cucullatus, *G. sulphureus*, spp. nn., Grand Comore; A. Milne Edwards & E. Oustalet, C.R. ci. p. 221.

Oxynotus; A. Newton, Encycl. Brit. ed. 9, xviii.

Pericrocotus marchesæ, sp. n., Maimbun, Sulu I.; F. H. H. Guillemard, P. Z. S. 1885, p. 259, pl. xviii. fig. 1.

CERTHIIDÆ.

Tichodroma muraria, sketches of its habits; F. C. Keller, Z. ges. Orn. 1885, pp. 329-340.

Cinclidæ.

The family, *sub voce* "Ouzel"; A. Newton, Encycl. Brit. ed. 9, xviii. fig.

Cinclus rufiventris, sp. n., Lebanon; H. B. Tristram, Faun. and Flor. Palest. [1884] p. 51.

Cœrebidæ.

Certhiola, synopsis of genus; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 27–30. *C. caboti*, Baird, is a good species, very near *C. tricolor* and *C. bahamensis*; *id. t. c.* p. 564. *C. finschi*, sp. n., Dominica; *id. t. c.* p. 25. *C. sancti-thomæ*, sp. n., St. Thomas and St. John's, W.I.; *id. t. c.* p. 28. *C. sundevalli*, sp. n. ?, Guadeloupe; *id. t. c.* pp. 26 & 27.

Cœreba cærulea microrhyncha, subsp. n., Colombia; H. v. Berlepsch, J. f. O. 1884, p. 287.

Corvidæ.

Cissa hypoleuca, sp. n., Thu-dau-mot, Cochin China; T. Salvadori & E. Giglioli, Atti Acc. Tor. xx. pp. 427 & 428 [collected in 1866]. *C. thalassina*, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxi.

Corvus corax in the Alpine districts of Austria; O. Reiser, MT. orn. Ver. Wien, 1885, pp. 50–52, 65–67, & 73–75. *C. japonensis*, criticism of paper by Brauns [*cf.* Zool. Rec. xxi. *Aves*, p. 48]; H. Pryer, Tr A. S. Japan, 1885, pp. 110–113, 2 pls. *C. kubaryi*, sp. n., Pelew Is.; A. Reichenow, J. f. O. 1885, p. 110.

Cyanocorax cucullatus, sp. n., Navarro, Costa Rica; R. Ridgway, P. U. S. Nat. Mus. viii. p. 23. *C. heilprini*, sp. n., Rio Negro; A. F. Gentry, P. Ac. Philad. 1885, p. 90.

Cyanopolius cyanus breeding in Zool. Gard.; P. L. Sclater, P. Z. S. 1885, p. 2.

Garrulus glandarius × *cervicalis* from Tangier; S. G. Reid, Ibis, 1885, p. 246.

Nucifraga caryocatactes, nest and four unfeathered young found at the beginning of April in Austria (near Gratz); P. F. S. Bauer, MT. orn. Ver. Wien, 1885, p. 43: its migration; V. v. Tschusi zu Schmidhoffen, *t. c.* p. 238; R. v. Dombrowski, *t. c.* pp. 251 & 274; A. Bayer, *t. c.* pp. 263 & 273; G. Szikla, *t. c.* pp. 309 & 310.

Streptocitta albicollis and *S. torquata* figured, &c.; W. Blasius, Z. ges. Orn. 1885, p. 296, pl. xiii.

Dicæidæ.

Dicæum rubrocoronatum, *D. pulchrius*, figured; R. B. Sharpe, Cat. Birds Brit. Mus. x. pl. i. figs. 1 & 2.

Lobornis alexandri figured; *id. t. c.* pl. ii. fig. 2.

Pholidornis rubifrons figured; *id. t. c.* pl. ii. fig. 1.

Pinaroloxias, g. n. [type, *Cactornis* (*Loxops*) *inornata*]; *id. t. c.* p. 52.

Pristorhamphus versteri, *Rhamphocharis crassirostris*, *Urocharis longicauda* figured; J. Gould, Birds N. Guinea, pts. xix. & xx.

[illegible] palpebrosa n.. Stol- [illegible]*eus guala-*[illegible]

Dicruridæ.

Chibia pectoralis = *C. borneensis*; F. H. H. Guillemard, P. Z. S. 1885, p. 259.

Fringillidæ.

Ægiothus exilipes, its egg, &c.; J. Murdoch, Exp. to Pt. Barrow, Alaska, p. 105: it appears to be a very good species, difference from *Æ. linaria* and *Æ. hornemanni*; W. E. Brooks, Ibis, 1885, pp. 382–384.

Acanthis albigularis new to Mark Brandenburg; H. Schalow, Z. ges. Orn. 1885, p. 26 [*cf.* Zool. Rec. xxi. *Aves*, p. 46].

Cardinalis cardinalis saturatus, subsp. n., Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 568–570 [also P. Biol. Soc. Wash. iii.]. *C. c. superbus*, subsp. n., Fuller's Ranch, &c., Arizona; *id.* Auk, ii. pp. 343–345.

Catamenia sp. ?, B. Guiana; O. Salvin, Ibis, 1885, p. 216.

Emberiza hortulana, *sub voce* "Ortolan"; A. Newton, Encycl. Ed. 9, xviii.

Euetheia olivacea intermedia, subsp. n., Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. p. 568 [also P. Biol. Soc. Wash. iii.]. [*Cf.* Godman & Salvin, Biol. Centr. Am. xliii. *Aves*, p. 360.]

Fringilla cælebs in Tangier; S. G. Reid, Ibis, 1885, p. 245.

Haplospiza unicolor [♂ ♀] figured; H. v. Berlepsch & H. v. Jhering, Z. ges. Orn. 1885, p. 123, pl. viii.

Junco cinereus palliatus, new geogr. race, Arizona; R. Ridgway, Auk, ii. pp. 363 & 364: W. E. D. Scott, *t. c.* pp. 354 & 355.

Leucosticte robowskii, sp. n., Zaidam, Tibet [not yet described]; Ed., Zool. 1885, p. 227.

Linota [see *Ægiothus*, above].

Oryzoborus nuttingi and *O. salvini*, spp. nn., Los Sábalos, Nicaragua; C. C. Nutting, P. U. S. Nat. Mus. vi. [1883] p. 401.

Passer, gen.: see Olphe-Galliard, L. *P. saturatus*, sp. n., Liu-kiu Is., Japan; L. Stejneger, *op. cit.* viii. pp. 19 & 20.

Peucæa æstivalis and *P. æ. bachmani*, the type of the latter wrongly referred to the former; W. Brewster, Auk, ii. p. 105. *P. mexicana* new to U. S.; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 98 & 99.

Phonipara intermedia [see *Euetheia*, above]. *P. phæoptila* [*cf.* Zool. Rec. xxi. *Aves*, p. 47] probably = *P. fumosa*, Lawr., from Trinidad; F. D. Godman & O. Salvin, Ibis, 1885, p. 118 [*cf. t. c.* p. 215].

Pinicola enucleator at Pulmak, north of the Arctic Circle; A. C. Chapman, *t. c.* p. 168.

Pipilo [see *Buarremon* (*Tanagridæ*).]

Pyrgisoma [see *Buarremon*].

Pyrrhula major, first record of breeding in Mark Brandenburg; H. Schalow, Z. ges. Orn. 1885, p. 28.

Spermophila superciliaris figured [ad., juv.]; H. v. Berlepsch & H. v. Jhering, *t. c.* p. 122, pl. vii. *S. gutturalis* subsp. n. *pallida*, Colombia; H. v. Berlepsch, J. f. O. 1884, pp. 294 & 295.

splendens (Vieill.) from B. Guiana; O. Salvin, Ibis, 1885, [illegible] is a distinct race from *V. jacarina*; F. D. Godman & O. Salvin, Biol. Centr. Am. xliii. *Aves*, p. 358.

Hirundinidæ.

Various species figured; see Sharpe, R. B., & Wyatt, C. W.

Cotile shelleyi, subsp. n. [formerly *C. riparia*, pt.], Egypt; R. B. Sharpe, Cat. Birds Brit. Mus. x. p. 100.

Petrochelidon ruficollis, description of nest and habits; W. Nation, P. Z. S. 1885, pp. 277–279: figured; R. B. Sharpe, Cat. Birds Brit. Mus. x. pl. iii. *P. timoriensis*, subsp. n. [of *P. nigricans*]; *id. t. c.* p. 192.

Icteridæ.

[illegible]*terus cucullatus*, its geogr. varr.; R. Ridgway, P. U. S. Nat. Mus. viii. [illegible] & 19: breeding habits in Arizona; W. E. D. Scott, Auk, ii. [illegible] *Cissopis*–165. *I. hauxwelli*, sp. n., Chamicuros, Upper Amazon; P. L. [illegible]r, P. Z. S. 1885, p. 671. *I. parisorum*, breeding habits in Arizona; [illegible] E. D. Scott, Auk, ii. pp. 1–7.

Laniidæ.

Collyriocincla boweri, sp. n., Cairns, Queensland; E. P. Ramsay, P. Linn. Soc. N. S. W. x. p. 244.

Dryoscopus ruficeps, sp. n., Somali-land [E. Lort Phillips]; G. E. Shelley, Ibis, 1885, p. 402, pl. x. fig. 1.

Gymnorhina leuconota, skeleton figured; A. B. Meyer, Abbild. Vogel.-skel. pl. lxxix.

Laniarius lagdeni, type presented to Brit. Mus.; Edd., Ibis, 1885, p. 456 [*cf.* Zool. Rec. xxi. *Aves*, p. 40].

Lanius dorsalis described and distinguished from *L. antinorii*, it is omitted from Cat. Birds Brit. Mus. viii.; G. E. Shelley, *t. c.* p. 401. *L. robustus* is probably not a North American Bird, synonymy, &c.; L. Stejneger, P. Ac. Philad. 1885, pp. 91–96.

Pachycephala fuscoflava figured; J. Gould, Birds N. Guinea, pt. xix.

Rhectes holerythrus and *R. decipiens*, skeletons figured; A. B. Meyer, Abbild. Vogel.-skel. pl. lxxxii. *R. leucorhynchus*, description of egg from Waigiu; A. Nehrkorn, J. f. O. 1885, p. 33: figured with *R. cervini-ventris*; J. Gould, Birds N. Guinea, pt. xx.

Telephonus jamesi, sp. n., Somali-land [E. Lort Phillips]; G. E. Shelley, Ibis, 1885, p. 403, pl. x. fig. 2.

Meliphagidæ.

Euthyrhynchus flavigula, *E. fulvigula*, *E. griseigula* figured; J. Gould, Birds N. Guinea, pt. xx.

Glycychæra fallax figured; *id. t. c.* pt. xix.

Myzomela annabellæ figured as frontispiece; H. O. Forbes, [illegible] *palpebrosa* [illegible] *gnala*-list's Wanderings in the Eastern Archipelago. *M. wakoloensis*, [illegible] now in Brit. Mus.; Edd., Ibis, 1885, p. 456 [*cf.* Zool. Rec. xxi. *Aves*, p. 41].

Œdistoma pygmæum figured: J. Gould, Birds N. Guinea, pt. xx.

Ptilotis albonotata figured; *id. ibid.* *P. analoga*, its egg from Waigiu; A. Nehrkorn, J. f. O. 1885, p. 33. *P. aruensis*, sp. n., Aru Is.; R. B. Sharpe, Rep. Voy. "Alert," Birds, p. 19 [1884].

Stigmatops chloris figured; J. Gould, Birds N. Guinea, pt. xx.

Zosterops mouroniensis and *Z. angasiæ*, spp. nn., Grand Comoro; A. Milne-Edwards & E. Oustalet, C.R. ci. p. 221. *Z. sumbavensis*, sp. n., I. of Sumbawa; F. H. H. Guillemard, P. Z. S. 1885, p. 508. *Z. brunneicauda*, *Z. uropygialis*, figured; J. Gould, Birds N. Guinea, pt. xix.

Mniotiltidæ.

Basileuterus auricularis, Colombia, Ecuador, Bolivia, *B. meridanus*, Merida (Venezuela) [formerly *B. bivittatus*, pts.], *B. roraimæ*, B. Gu[illegible] *B. bolivianus*, Yuyo (Bolivia) [formerly *B. mesoleucus*, pt.], spp. nn. *B. veraguensis*, Veragua and Panama [formerly *B. leucopygius*, pt.], subsp. n.; R. B. Sharpe, Cat. Birds Brit. Mus. x. pp. 386, 387, 392, 402, & 403.

Dendræca blackburniæ, description of nest and eggs from New York Co.; C. H. Merriam, Auk, ii. p. 103. *D. granadensis*, subsp. n. [formerly *D. vieilloti*, pt.], Colombia; R. B. Sharpe, Cat. Birds Brit. Mus. x. p. 284. *D. petechia ruficertex*, subsp. n., Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 348 & 563 [also P. Biol. Soc. Wash. iii.]. *D. bryanti castaneiceps*, subsp. n., Cape St. Lucas, *D. æstiva*, *D. petechia*, *D. capitalis*, *D. rufopileata*, *D. rufigula*, *D. vieilloti*, *D. bryanti*, and subspp.; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 348–350. *D. tigrina*, its breeding habits in New Brunswick; M. Chamberlain, Auk, ii. pp. 33–36.

Geothlypis bairdi, sp. n., Los Sábalos, Nicaragua; C. C. Nutting, P. U. S. Nat. Mus. vi. [1883] pp 398 & 399. *G. trichas*, *G. melanops*, *G. poliocephala*, *G. velata*, *G. chiriquensis*, *G. æquinoctialis*, *G. auricularis*, *G. speciosa* figured; R. B. Sharpe, Cat. Birds Brit. Mus. x. pls. ix. & x.

Granatellus sallæi boucardi, subsp. n., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. p. 23.

Helinaia swainsoni, full account of occurrences, description, &c.; A. Brewster, Auk, ii. pp. 65–80: taken at a lighthouse at the Flor. Reefs; *id. t. c.* pp. 104 & 105: its nests and eggs [2]; *id.* Forest a[illegible] Stream, xxiv. [1885] p. 458: additional notes on nests and eggs [2 more], *id.* Auk, ii. pp. 346–348: in Jamaica; C. H. Merriam, *t. c.* p. 377.

Helminthophila leucobronchialis is probably a genuine species, though it hybridizes with its connections; R. Ridgway, *t. c.* pp. 359–363.

Parula pitiayumi, *P. nigrilora*, figured, R. B. Sharpe, Cat. Birds Brit. Mus. x. pl. xi. *P. p. pacifica*, subsp. n., W. Ecuador; H. v. Berlepsch, P. Z. S. 1884, p. 286.

[illegible]a guatemalæ, subsp. n. [formerly *S. picta*, pt.], Central [illegible]a ; H. v. Berlepsch, P. Z. S. 1884, p. 417. *S. verticalis* from B. Guiana [Roraima] ; O. Salvin, Ibis, 1885, p. 203.

Teretistris fernandinæ, *T. fornsi*, figured ; R. B. Sharpe, Cat. Birds Brit. Mus. x. pl. xii.

Motacillidæ.

Anthus, *sub voce* "Pipit" ; A. Newton, Encycl. Brit, ed. 9, xix. *A. antarcticus* and egg figured ; Pagenstecher, Vögel Süd-Georgiens [*cf.* Zool. Rec. xxi. *Aves*, p. 39]. *A. nicholsoni* [formerly *A. campestris*, pt. ; *cf.* Layard's B. S. Afr. p. 536 (1884)], S. Africa, sp. n., *A. pallidiventris* [formerly *A. gouldi*, pt.], W. Africa, subsp. n. ; R. B. Sharpe, Cat. Birds Brit. Mus. x. pp. 550, 553, & 560. *A. nilghiriensis* for *A. montanus* ; *id. t. c.* p. 550. *A. bocagii*, sp. n. [= *A. pallescens*, Bocage, *nec* V. & H.] ; F. Nicholson, Ibis, 1884, p. 469.

Motacilla xanthophrys, pl. [formerly *M. melanocephala*, pt.], Lenkoran, sp. n. ; *id. t. c.* p. 532. *M. lugens*, *M. ocularis*, *M. hodgsoni*, *M. personata*, *M. persica*, *M. campestris*, *M. flava*, *M. beema*, *M. borealis*, *M. cinereicapilla*, *M. feldeggi*, *M. kaleniczenkii*, *M. xanthophrys*, figured ; *id. t. c.* pls. iv.–viii. *M. grandis* for *M. japonica* ; *id. t. c.* p. 492.

Nemoricola indica from Korea ; H. B. Tristram, Ibis, 1885, p. 194.

Oreocorys, g. n. [type, *Heterura* (*Anthus*) *sylvana*] ; R. B. Sharpe, Cat. Birds Brit. Mus. x. p. 622.

Xanthocorys, g. n. [type, *Anthus correndera* (*nattereri*)] ; *id. t. c.* p. 619.

Muscicapidæ.

Chasiempis sandwichensis, ♀, = *C. sclateri* (probably), = *Muscicapa maculata*, Gm. ; if so, it will stand as *C. maculata* ; P. L. Sclater, Ibis, 1885, pp. 17–19. pl. i.

Humblotia flavirostris, g. & sp. nn., near *Hemichelidon* and *Pseudobias*, Grand Comore ; A. Milne-Edwards & E. Oustalet, C.R. ci. pp. 221 & 222.

Muscicapa semitorquata, sp. n. [*M. luctuosa* of Radde, Orn. Caucas. p. 286] ; E. F. v. Homeyer, Z. ges. Orn. 1885, pp. 185 & 186, pl. x. [♂ ♀].

Myiagra fulviventris figured ; J. Gould, Birds N. Guinea, pt. xix.

Rhipidura atrigularis, sp. n., near *R. rufifrons*, *R. versicolor*, Pelew Is. ; A. Reichenow, J. f. O. 1885, p. 110. *R. vidua* figured ; J. F. Snelleman, *Cy*[illegible]idden Sumatra," *Aves*, pl. ii.

pl. l. *Terpsiphone comorensis*, sp. n., Grand Comore ; A. Milne-Edwards & Oustalet, C.R. ci. p. 222.

E *Siphia tickelliæ*, ♂, = *Cyornis banyumas*, Jerd., = *C. jerdoni*, Blyth ; C. Swinhoe & H. Barnes, Ibis, 1885, p. 66.

Nectariniidæ.

Æthopyga siparaja or sp. n.?, Banguey I., N. Borneo ; F. H. H. Guillemard, P. Z. S. 1885, p. 410.

Arachnothera concolor figured ; J. F. Snelleman, "Midden *Aves*, pl. i.

Cinnyris mediocris, sp. n., Kilima-njaro ; G. E. Shelley, P. Z. S. 1885, p. 228. *C. humbloti*, sp. n., Grand Comore; A. Milne-Edwards & E. Oustalet, C.R. ci. pp. 220 & 221.

Cyrtostomus frenatus var. n. *plateni*, Mangkassar and Kalibangkere ; W. Blasius, Z. ges. Orn. 1885, pp. 289–291, pl. xii. [♂♀].

Nectarinia johnstoni, sp. n., Kilima-njaro ; G. E. Shelley, P. Z. S. 1885, p. 227, pl. xiv.

Oriolidæ.

Oriolus chinensis = *O. suluensis* = *O. frontalis* = *Broderipus palawanensis* probably ; F. H. H. Guillemard, P. Z. S. 1885, p. 262.

Orthonycidæ.

Orthonyx ; A. Newton, Encycl. Brit. ed. 9, xviii.

Paradiseidæ.

Various species described at length ; F. H. H. Guillemard, P. Z. S. 1885, pp. 646–656. [See also Rosenberg (Baron).]

Amblyornis subalaris, ♂ (new to science), Hufeisen Mts., New Guinea ; O. Finsch & A. B. Meyer, Z. ges. Orn. 1885, p. 390, pl. xxii.

Astrarchia stephaniæ (♂), g. & sp. nn, Hufeisen Mts., New Guinea ; *iid. t. c.* pp. 378–380, pl. xviii.

Diphyllodes hunsteini (♂), sp. n., Hufeisen Mts., New Guinea ; *iid. t. c.* p. 389, pl. xxi. *D. jobiensis*, sp. n., I. of Jobi, New Guinea ; *iid. t. c.* p. 388. *D. bruijni* is a good species ; F. H. H. Guillemard, P. Z. S. 1885, p. 649.

Drepanornis cervinicauda figured ; O. Finsch & A. B. Meyer, Z. ges. Orn. 1885, p. 381, pl. xix.

Epimachus meyeri (♀), sp. n., Hufeisen Mts., New Guinea ; *iid. t. c.* p. 380.

Lophorina superba minor, sp. n., Astrolabe Mts., New Guinea ; E. P. Ramsay, P. Linn. Soc. N. S. W. x. p. 242 : ♀ (new to science) from Hufeisen Mts., New Guinea ; O. Finsch & A. B. Meyer, Z. ges. Orn. 1885, p. 376, pl. xvii.

Manucodia rubiensis, sp. n., near *M. chalybeata*, Rubi, New Guinea ; *iid. t. c.* p. 374.

Paradisea finschi (♂), sp. n., N.W. New Guinea, Karan ; *iid. t.* A. p. 383. *P. raggiana*, its habits ; J. Chalmers, Work and Adventures New Guinea, pp. 245–249. *P. decora* figured ; J. Gould, Birds N. Guine pl. xx.

Paradisornis rudolphi, g. & sp. nn., Hufeisen Mts., New Guinea ; O. Finsch & A. B. Meyer, Z. ges. Orn. 1885, pp. 385–387, pl. xx.

Parotia lawesi, sp. n., near *P. sexpennis*, Astrolabe Mts., New Guinea : E. P. Ramsay, P. Linn. Soc. N. S. W. x. p. 243 : ♀ (new to science) from Hufeisen Mts., New Guinea ; O. Finsch & A. B. Meyer, Z. ges. Orn. 1885, p. 375, pl. xvi.

...ia purpureo-violacea, sp. n., near *P. keraudrenii*, from Hufeisen ... Guinea ; O. Finsch & A. B. Meyer, Z. ges. Orn. 1885, p. 375, pl. xv.

Schlegelia respublica, skeleton figured ; A. B. Meyer, Abbild. Vogel-skel. pl. lxxviii.

Seleucides nigricans, native method of capture, habits in confinement ; F. H. H. Guillemard, P. Z. S. 1885, pp. 650 & 651.

Uranornis rubra, skeleton figured ; A. B. Meyer, Abbild. Vogel-skel. pl. lxxvii.

Paridæ.

Leptopœcile sophiæ major, subsp. n., from Ush-tur-fan on the Taushkan-Darja and the Koushaal, Kashgaria ; M. Menzbier, Ibis, 1885, p. 353.

Parus cinerascens [= *sarawacensis*, first name pre-occupied, *t. c.* p. 327], sp. n., near *P. cinereus*, Bungal Hills, Sarawak ; H. H. Slater, *t. c.* pp. 121–123, pl. iv. *P. pallidiventris*, sp. n., Kakoma, E. Africa ; A. Reichenow, J. f. O. 1885, p. 217. *P. thruppi*, sp. n., near *P. afer*, Somali-land [E. Lort Phillips] ; G. E. Shelley, Ibis, 1885, pp. 406 & 407, pl. xi. fig. 2.

Ploceidæ.

Synonomy of various species, alterations necessary in certain cases ; A. Reichenow, *t. c.* pp. 372–374.

Euplectes ladoensis, sp. n., Lado, Central Africa ; *id. t. c.* p. 218.

Foudia consobrina, sp. n., Grand Comore ; A. Milne-Edwards & E. Oustalet, C.R. ci. p. 222.

Pyrenestes personatus and *P. coccineus* sometimes indistinguishable ; J. Büttikofer, Notes Leyd. Mus. vii. p. 200.

Textor boehmi, sp. n., Tanganyika and Victoria Nyanza ; A. Reichenow, J. f. O. 1885, p. 372.

Uraeginthus ianthinogaster, fig. in J. f. O. is misleading, redescribed by G. E. Shelley, Ibis, 1885, pp. 408 & 409.

Pycnonotidæ.

Criniger simplex, skeleton figured ; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxiv.

Hypsipetes parvirostris, sp. n., Grand Comore ; A. Milne-Edwards & E. Oustalet, C.R. ci. p. 222.

Sittidæ.

Sitta cæsia from Tangier ; S. G. Reid, Ibis, 1885, p. 243. *S. whiteheadi*, description of its discovery and woodcut of its nest ; J. Whitehead, *t. c.* pp. 24–48, pl. ii. (♂ ♀ and egg) [*cf.* Zool. Rec. xxi. *Aves*, p. 38].

Sturnidæ.

Basilornis celebensis, heads figured, &c.; W. Blasius, Z. ges. Orn. 1885, p. 299, cuts.

Calornis gularis figured; J. Gould, Birds N. Guinea, pt. xx.

Macruropsar magnus, skeleton figured; A. B. Meyer, Abbild. Vogelskel. pl. lxxxi.

Pastor roseus, occurrences in 1884 in Austria and Hungary; V. v. Tschusi zu Schmidhoffen, MT. orn. Ver. Wien, 1885, p. 59.

Sarcops calvus = *S. lowii*; F. H. H. Guillemard, P. Z. S. 1885, p. 267.

Sylviidæ.

Locustella nævia, *L. luscinioides*, *L. fluviatilis*; A. v. Homeyer, MT. orn. Ver. Wien, 1885, pp. 281–283 & 293–295.

Phylloscopus seebohmi = *P. plumbeitarsus*, not *P. viridanus*; W. E. Brooks, Ibis, 1885, p. 387. *P. viridipennis*, Blyth [type], is *P. trochiloides*, which leaves the name *P. presbytis*, Müll., for the Burmese bird; *id. t. c.* p. 387.

Pinarochroa hypospodia, sp. n., Kilima-njaro; G. E. Shelley, P. Z. S. 1885, p. 226, pl. xiii.

Polioptila lactea, loc. incert.. *P. parvirostris*, Upper Amazonia, *P. sclateri* [formerly *P. nigriceps*, pt.], Venezuela and Colombia, spp. nn.; R. B. Sharpe, Cat. Birds Brit. Mus. x. pp. 448, 449, & 453.

Ruticilla moussieri in Tangier; S. G. Reid, Ibis, 1885, p. 242.

Sylvia melanocephala breeding in Malta; H. E. Dresser [*fide* D. Bruce], *t. c.* p. 454. *S. nisoria*, juv., Broadford, I. of Skye, (possibly) bred there; *id. t. c.* pp. 453 & 454 [*cf.* Zool. Rec. xxi. *Aves*, p. 36].

Tanagridæ.

Buarremon albiceps is a *Pyrgisoma*, *B. nationi* is probably the same, and not a *Pipilo* [= *P. mystacalis*, Tacz.]; P. L. Sclater, Ibis, 1885, p. 275. *B. sordidus* = *B. pallidinuchus*, juv.; *id. t. c.* p. 275. [See also *Chlorospingus*, below.]

Calliste gouldi, sp. n., S.E. Brazil; *id. t. c.* pp. 849 & 850. *C. pulchra æquatorialis*, subsp. n., Berl., MS., Machay and Mapoto, Ecuador, L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 77 [differs somewhat from specimens from Peru]. *C. taylori*, sp. n., Stolzm., MSS., Machay, Ecuador; *iid. t. c.* pp. 78 & 79. *C. cæruleocephala* subsp. n. *granadensis*, Colombia: H. v. Berlepsch, J. f. O. 1884, p. 290.

Chlorospingus is perhaps the correct generic name of *Buarremon flavirens*; P. L. Sclater, Ibis, 1885, p. 274. *C. reyi*, sp. n., near *C. superciliaris*, Mérida, Venezuela; H. v. Berlepsch, *t. c.* p. 288. *C. signatus*, sp. n., Machay and Mapoto, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 82. [See also *Nesospingus*, below.]

Euphonia plumbea from B. Guiana; O. Salvin, Ibis, 1885, p. 208. *E. purpurea*, Lawr., = *E. violacea*; P. L. Sclater, *t. c.* p. 272.

...lorencii, sp. n., from Trinidad (= *Tachyphonus atricapillus*, ... P. L. Sclater, Ibis, 1885, p. 272, pl. vi. fig. 2.

Nesospingus is perhaps the correct generic name of *Chlorospingus speculiferus*, unless it is a Ground Finch; *id. t. c.* pp. 273 & 274, cut.

Phænicothraupis rhodinolæma, Salv. & God., = *P. peruvianus*, Tacz., over which it has priority; *id. t. c.* p. 272.

Poecilothraupis palpebrosa subsp. n. *cærulescens*, Berl., MS., San Rafael, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 80.

Pyrrhocoma ruficeps figured; H. v. Berlepsch & H. v. Jhering, Z. ges. Orn. 1885, p. 120, pl. vi. [♂ ♀].

Spindalis benedicti, sp. n., Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 567 & 568 [also P. Biol. Soc. Wash. iii.]. Described and figured as *S. exsul*, sp. n.; O. Salvin, Ibis, 1885, p. 189, pl. v.

Tachyphonus co...natus, skeleton figured; A. B. Meyer, Abbild. Vogelskel., pl. lxxviii. *T. intercedens*, Berlepsch, = *T. cristatus* (Gm.); O. Salvin, Ibis, 1885, p. 212. *T. napensis*, Lawr., is only a subspecies of *T. surinamus*; P. L. Sclater, *t. c.* p. 273. *T. nattereri* figured; *id. t. c.* p. 273, pl. vi. fig. 1. [See also *Lanio*, above.]

Urothraupis stolzmanni, g. & sp. nn., San Rafael, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, p. 83, pl. viii.

Timeliidæ.

Argya aylmeri, sp. n., Somali-land [E. Lort Phillips]; G. E. Shelley, Ibis, 1885, p. 404, pl. xi. fig. 1.

Brachypteryx salaccensis, sp. n., Mt. Salak, West Java; A. G. Vorderman, Bijdrage tot de Kennis der Avifauna van den Berg Salak, pp. 33 & 34; also Tijdschr. Nederl. Ind. xliv. pp. 188 & 194.

Macronus kettlewelli, sp. n., Lukatlapas, Sulu I.; F. H. H. Guillemard, P. Z. S. 1885, p. 262, pl. xviii. fig. 2.

Mixornis cagayanensis, sp. n., I. of Cagayan Sulu; *id. t. c.* p. 419, pl. xxv.

Pomatorhinus geoffroyi, skeleton figured; A. B. Meyer, Abbild. Vogelskel. pl. lxxx.

Rhopophilus deserti, ♂ ♀ described at length, it lies between *R. pekinensis* and *R. albosuperciliaris* [but see note]; M. Menzbier, Ibis, 1885, pp. 354–356 [*cf.* Zool. Rec. xxi. *Aves*, p. 37].

Trichophorus poliocephalus = *Alethe castanonota*; J. Büttikofer, Notes ... Leyd. Mus. vii. p. 177.

spec...
p. ...

Troglodytidæ.

E. ... *branickii*, sp. n., Machay and Mapoto, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, pp. 72 & 73, pl. vii. fig. 1.

Dresser, H. E. A... sp. n., Bogota; P. Matschie, J. f. O. 1885, p. 466.
eaters. London: ... from B. Guiana; correction of a statement in Cat.
bered). [*Cf.* Zool. ... alvin, Ibis, 1885, p. 201.

The species (figured) ... *rianæ*, subsp. n., from Sierras de Sta. Catalina, *color*, *M. leschenaultii*, *M.* ... Auk, ii. pp. 351 & 352. *T. beani*, sp. n., Cozumel I.,

Yucatan ; R. Ridgway, P. U. S. Nat. Mus. viii. p. 563 [*is palpebrosa* ... *ens guala*- Soc. Wash. iii.]. *T. hirtensis*, S. Kilda; C. Dixon, Ibis, 1885, ... pl. iii. ; *t. c.* p. 359 [*cf.* Zool. Rec. xxi. *Aves*, p. 38].

Turdidæ.

The family, *sub voce* "Ouzel" ; A. Newton, Encycl. Brit. ed. 9, xviii. fig.

Geocichla machiki figured (plain) ; H. O. Forbes, Wanderings Eastn. Arch. p. 337 [*cf.* Zool. Rec. xxi. *Aves*, p. 35].

Harporhynchus guttatus, sp. n., Cozumel I., Yucatan : R. Ridgway, P. U. S. Nat. Mus. viii. pp. 561 & 562 [also P. Biol. Soc. Wash. iii.]. It is *H. melanostoma*, sp. n., of O. Salvin, Ibis, 1885, p. 187.

Myiophoneus borneensis, sp. n. ?, from Bungal Hills, Sarawak ; H. H. Slater, Ibis, 1885, pp. 123 & 124.

Pseudocossyphus [*cf.* Zool. Rec. xxi. *Aves*, p. 35], name pre-occupied and changed to *Neocossyphus* ; G. A. Fischer & A. Reichenow, Z. ges. Orn. 1884, p. 301.

Saxicola œnanthe probably breeding on N. shore of the Gulf of St. Lawrence ; C. H. Merriam, Auk, ii. p. 305. *S. deserti*, second occurrence in Britain, at Holderness, Yorks ; W. E. Clarke, Zool. 1885, p. 479 ; Nat. 1885, p. 387 ; H. E. Dresser, P. Z. S. 1885, pp. 835 & 836. *S. phillipsi*, sp. n., Somali-land [E. Lort Phillips] compared with *S. seebohmi* ; G. E. Shelley, Ibis, 1885, p. 405, pl. xii.

Turdus comorensis, sp. n., Grand Comore ; A. Milne-Edwards & E. Oustalet, C.R. ci. p. 221. *T. murinus*, sp. n., near *T. ignobilis*, Merumé, Roraima, B. Guiana ; O. Salvin, Ibis, 1885, p. 197. *T. pilaris*, instances of breeding in Germany, &c. ; A. v. Homeyer, MT. orn. Ver. Wien, 1885, pp. 8, 9, 21, 31, 32, 40–42, & 54–56 ; E. F. v. Homeyer, *t. c.* pp. 245–247 & 257–259. *T. viscivorus*, first record of its breeding in Tangier ; S. G. Reid, Ibis, 1885, p. 242.

Vireonidæ.

Cyclorhis insularis, sp. n., Cozumel I., Yucatan ; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 566 & 567 [also P. Biol. Soc. Wash. iii.].

Vireo atricapillus, its breeding in S.W. Kansas ; N. S. Goss, Auk, ii. p. 275. *V. bairdi*, sp. n., Cozumel I., Yucatan ; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 565 & 566 [also P. Biol. Soc. Wash. iii.]. *V. cinereum* sp. n., Cozumel I., Yucatan ; *id. t. c.* p. 565 : = *V. magister*, Salvin, ay, 1885, p. 188 [also P. Biol. Soc. Wash. iii.]. *V. forreri*, sp. n., Tres Marv, Is. ; J. v. Madarász, Term. füzetek ix. i. p. 85, pl. vi. ... its nest and eggs ; E. E. T. Seton, Auk, ii. p. 306. ... *Buarremon flav*- ing habits in Arizona ; W. E. D. Scott, *t. c.* pp. 321–... n., near *C. super*- *Vireolanius pulchellus verticalis*, subsp. n., Costa ... p. 288. *C. signatus*, Ridgway, P. U. S. Nat. Mus. viii. p. 24. ...rski & H. v. Berlepsch, ... Ibis, 1885, p. 208. *E.* ... p. 272.

PICARIÆ.

Picidæ.

E. Hargitt. Notes on Woodpeckers. No. ix. On the Genus *Micropternus*. Ibis, 1885, pp. 1–16.

——. Ditto. No. x. On the Genus *Thriponax*. *T. c.* pp. 140–157.

In the first paper the author gives a full account of *M. phœoceps*, *M. badiosus*, *M. gularis*, *M. brachyurus*, *M. fokiensis*, *M. holroydi*, with a key. He disagrees with Hume's statement (Str. Feath. 1877, p. 472) that *M. fokiensis* from Foochow = *M. brachyurus*, and that *M. holroydi* from Hainan = *M. phœoceps*; considering them respectively distinct. In the second paper he describes *T. javensis*, *T. crawfurdi*, *T. feddeni* (*jerdoni*), *T. hargitti* [the nomenclature of these 4 appearing to have been more or less in a state of confusion], *T. hodgii*, *T. pectoralis*, *T. hodgsoni*, *T. richardsi*, with a key.

Alophonerpes wallacii figured [♂ ♀], &c.; W. Blasius, Z. ges. Orn. 1885, p. 236. pl. xi.

Centurus dubius lecei, subsp. n. [= *C. dubius*, Salvin, Ibis, 1885, p. 192], Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 575 & 576 [also P. Biol. Soc. Wash. iii.]. *C. rubriventris pygmæus*, subsp. n. [*C. rubriventris*, Salvin, Ibis, 1885, p. 192]. Cozumel I., Yucatan; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 576 & 577.

Gecinus weberi, type now in Brit. Mus.; Edd., Ibis, 1885, p. 456 [*cf.* Zool. Rec. xix. *Aves*, p. 39].

Iyngipicus frater, sp. n., Malacca; T. Salvadori & E. Giglioli, Atti Acc. Tor. xx. pp. 824 & 825. *I. ramsayi* from Sulu I., figured; F. H. H. Guillemard, P. Z. S. 1885, p. 254, pl. xvii. *I. wattersi*, sp. n., Formosa; T. Salvadori & E. Giglioli, Atti Acc. Tor. xx. p. 825.

Micropternus gularis, *M. phœoceps*, *Halcyon occipitalis*, *H. chloris*, breeding in ants' [or hornets'] nests; W. Davison, Nature, xxxi. p. 438. Also [*M. phœoceps*] C. Bingham, *op. cit.* xxxii. p. 52.

Picumnus jheringi [*cf.* Zool. Rec. xxi. *Aves*, p. 51] and *P. temminckii* figured; H. v. Berlepsch & H. v. Jhering, Z. ges. Orn. 1885, p. 156, pl. ix. figs. 1 & 2.

Picus insularis, sp. n.?; C. J. Maynard, in a "Catalogue of Bahama Bird's Skins, Nests, and Eggs" [*cf.* Auk, ii. p. 115]. *P. medius*, its nesting and number of eggs; A. Walter, J. f. O. 1885, p. 371. *P. villosus*, specimens shot at Whitby in 1848 are now in Brit. Mus.; Edd., Ibis, 1885, p. 455 [*cf.* Yarrell (Newton) ii. p. 485].

E. Trochilidæ.

Dresser, H. E. A Suppl. to Trochil. [see Gould, J.], pt. iii., *Selasphorus*, *Calothorax*, *Eulampis*, *Anthracothorax*, *Lampornis*, *Eupherusa*, *Panychlora*, *Chlorostilbon*, *Cynanthus*, *Hylocharis*, *Amazilia*, *Leucippus*, *Saucerottia*, *Cyanophaia*, *Basilinna*, *Damophila*, *Lepidopyga*, *Hylocharis*, *Chrysuronia*, *Polyerata*, *Lampropygia*, *Thalurania*, *Panterpe*, *Eugenes*, *Hylocharis*, *Lampornis*, *Delattria*, *Trochilus*, *Calliphlox*, *Stellula*, *Selasphorus*, *Atthis*, *Calothorax*, *Rhodopis*, *Oreotrochilus*, *Patagona*, *Aglaiocercus*, *Lesbia*, *Ramphomicron*, *Metallura*, *Chalcostigma*, *Oxypogon*, *Opisthoprora*, *Lafresnaya*, *Heliangelus*, *Eulidia*, *Taphrospilus*, *Myrtis*, *Thaumastura*, *Thaumatias*, *Florisuga*, *Phæthornis*, *Eutoxeres*, *Threnetes*, *Campylopterus*, *Pterophanes*, *Heliomaster*, *Lophornis*, *Discura*, *Sericotes*, *Urosticte*, *Heliangelus*, *Eriocnemis

Campylopterus phænopeplus, *Diphlogæna hesperus*, *D. auro-* *palpebrosa* *eus guala-* *calolæma*, *O. cinereicauda*, *Cœligena hemileuca*, *Agyrtria bartlett-* *tilis*, *A. taczanowskii*, *Uranomitra viridifrons*, *Timolia lerchi*, *Eugenes spectabilis*.

The family [anatomy], see SHUFELDT, R. W.

Campylopterus hyperythrus from B. Guiana [Roraima] ; O. Salvin, Ibis, 1885, p. 432.

Chlorostilbon forficatus, sp. n. [= *C. caniveti*, Salvin, Ibis, 1885, p. 191], Cozumel I., Yucatan ; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 574 & 575 [also P. Biol. Soc. Wash. iii.].

Chrysolampis gigliolii, sp. n., Colombia ; E. Oustalet, Le Nat. 1885, p. 108.

Cœligena clemenciæ new to United States (Arizona); W. Brewster, Auk, ii. p. 85 [*cf.* p. 199].

Discura sp ? perhaps = *Trochilus platurus*, from B. Guiana ; O. Salvin, Ibis, 1885, p. 434.

Lampornis prevosti thalassinus, subsp. n., Cozumel I., Yucatan ; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 573 & 574 [also P. Biol. Soc. Wash. iii.].

Panychlora poortmani major, subsp. n. ; H. v. Berlepsch, J. f. O. 1884, p. 313.

Trochilus, species of doubtful occurrence in Guiana ; O. Salvin, Ibis, 1855, p. 436.

CYPSELIDÆ.

The family [anatomy], see SHUFELDT, R. W.

Chætura zonaris from B. Guiana, is it identical with *Hemiprocne minor*, Lawr., or *H. albicincta*, Cab. ? ; O. Salvin, Ibis, 1885, p. 436.

Collocalia nidifica. Statement of the three hypotheses as to the construction of the nest ; that it is made—(i.) partly of saliva, partly of vegetable matter ; (ii.) of fish spawn or mollusca ; (iii.) of saliva entirely. Decision (after the use of the microscope and chemical re-agents) that there is no trace of vegetable matter other than accidental, that it has no ferment properties, and is undoubtedly a product of the activity of some gland in the body, but it does not appear whether peptic or salivary (though the latter is the more probable). J. R. Green, Journal of Physiology, 1885, p. 40. [See also H. de Varigny, La Nature, 1885, pp. 186 & 187 ; J. Büttikofer, P. Z. S. 1885, p. 610 ; W. B. Pryer, Zool. 1885, p. 296 ; G. Murray, *t. c.* p. 147.

Cypselus andicola, remarks ; W. Nation, P. Z. S. 1885, p. 279.

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The family [anatomy], see SHUFELDT, R. W.

Antrostomus whitelyi, sp. n., near *A. nigrescens* [Roraima] ; O. Salvin, Ibis, 1885, p. 438.

Batrachostomus cornutus, description of two nest from Kampong Moeroeng and Kampong Pag J. f. O. 1885, pp. 341–343, pl. iv.

Buarremon flai . n., near *C. super-* p. 288. *C. signatus*, ski & H. v. Berlepsch, Ibis, 1885, p. 208. *E.* . p. 272.

...lus nuttalli, curious feeding habits ; R. W. Shufeldt, Auk, ii. ...3.

Coliidæ.

A description of the eight species composing the family, with a key to them and a table of their distribution ; G. E. Shelley, Ibis, 1885, pp. 307–314.

Colius senegalensis in confinement ; G. Eismann, Zool. Gart. 1885, pp. 361–363.

Alcedinidæ.

Halcyon (*Cyanalcyon*) *albonotata*, sp. n., New Britain ; E. P. Ramsay, P. Linn. Soc. N. S. W. ix. p. 863. *H. malimbica* = *H. cinereifrons* ; J. Büttikofer, Notes Leyd. Mus. vii. pp. 162–165. *H. nigrocyanea* = *H. quadricolor* ; F. H. H. Guillemard, P. Z. S. 1885, pp. 626 & 627. *H. norfolkiensis*, sp. n., near *H. sancta*, Norfolk I. ; H. B. Tristram, Ibis, 1885, p. 49. *H. smyrnensis* from the Caspian, new to Russia ; G. Radde, *t. c.* p. 237. *H. tristrami* figured ; J. Gould, Birds N. Guinea, pt. xix.

Sauromarptis gaudichaudi, colour of tail as determining the sex ; F. H. H. Guillemard, P. Z. S. 1885, p. 628.

Bucerotidæ.

An account of the family ; E. Oustalet, La Nature, 1885, pp. 375–378.

Anthracoceros lemprieri, sp. n., Palawan, Philippine Islands ; R. B. Sharpe, P. Z. S. 1885, p. 446, pl. xxvi. *A. marchii*, sp. n., Puerto Princesa, Palawan ; Busuanga ; Balabac [Philippine Archipel.] ; E. Oustalet, Le Nat. 1885, p. 108.

Buceros leucopygius, sp. n., Nyam-nyam, Cent. Africa ; A. Dubois, Bull. Mus. Belg. iii. p. 202, pl. x. fig. 1. *B. nasutus* var. n. *dubia*[*-us*], Tanganyika, Cent. Africa ; *id. t. c.* p. 213, pl. x. fig. 2. *B. fistulator* figured and described ; *id. t. c.* p. 203, pl. xi. *B. pulchrirostris* = *B. camurus* ; J. Büttikofer, Notes Leyd. Mus. vii. p. 211. *B. rhinoceros*, respiratory apparatus ; A. Milne-Edwards, C.R. xcix. pp. 833–836 [1884].

Tockus fasciatus, skeleton figured ; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxviii.

Irrisoridæ.

Irrisor erythrorhynchus, the black-billed race from Somali-land, where the red-billed does not occur ; reasons for not separating them as species ; G. E. Shelley [E. Lort Phillips' Notes], Ibis, 1885, pp. 395 & 396.

Rhinopomastes cabanisi, a correction ; *id. t. c.* p. 397.

E.

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Dresser, H. E. A Monograph of the *Meropidæ*, or Family of the Bee-eaters. London : 1885, sm. fol., pt. iv. pp. 107–131, 7 pls. (ununumbered). [*Cf.* Zool. Rec. xxi. *Aves*, p. 53.]

The species (figured) are *Melittophagus sonninii*, *M. pusillus*, *M. quinticolor*, *M. leschenaulti*, *M. gularis*, *M. muelleri*, *M. bullockoides*.

Merops angolensis, skeleton figured; A. B. Meyer, Abbild. *palpebrosa* pl. lxxxiv. *M. philippinus* var. n. *celebensis*, Mangkassar at. *eus guala-* kere, S. Celebes; W. Blasius, Z. ges. Orn. 1885, pp. 239–242.

Coracidæ.

Coracias lorti, sp. n., near *C. caudata*, from Somali-land [E. Lort Phillips]; G. E. Shelley, Ibis, 1885, p. 399. *C. nævia levaillanti*, subsp. n.? from S. Africa, should probably be distinguished as above from *C. nævia* of E. and W. Africa; *id. ibid.*

Eurystomus afer, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxx.

Leptosomus gracilis, sp. n., Grand Comore; A. Milne-Edwards & E. Oustalet, C.R. ci. p. 220.

Galbulidæ.

Galbula pastazæ, sp. n., Mapoto and Machay, Ecuador; L. Taczanowski & H. v. Berlepsch, P. Z. S. 1885, pp. 107 & 108.

Rhamphastidæ.

Pteroglossus wiedi, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxvii.

Capitonidæ.

Trachyphonus erythrocephalus from Somali-land, apparently differs in colouration from the type; G. E. Shelley, Ibis, 1885, p. 394.

Tricholæma stigmatothorax from Somali-land, difference of colouration; *id. ibid.*

Cuculidæ.

Beddard, F. E. On the Structural Characters and Classification of the Cuckoos. P. Z. S. 1885, pp. 168–187, cuts.

The author finds that his researches tend to divide the family into 3 groups:—i. *Cuculinæ* (*Cuculus, Chrysococcyx, Cacomantis, Coccystes?, Saurothera, Diplopterus, Piaya, Coccyzus*); ii. *Phœnicophainæ* (*Eudynamis, Phœnicophäes*); iii. *Centropodinæ* (*Pyrrhocentor, Centropus, Coua?, Geococcyx, Crotophaga, Guira*). In the first, the pectoral feather-tract is single, in the two latter it is divided; these two being distinguished from one another by the fact of the syrinx being tracheo-bronchial and bronchial respectively. The statements of Owen as to the gall-bladder, and of Nitzsch as to pterylosis and number of rectrices, are challenged.

Centrococcyx javanensis, the ♀ is the larger [= *C. affinis*], the ♂ the smaller bird; W. Blasius, Z. ges. Orn. 1885, p. 265.

Centropus francisci, successive changes of colour, *C. monachus* = *C. senegalensis*, ad.?; J. Büttikofer, Notes Leyd. Mus. vii. pp. 222 & 223.

...obrus, on the hard and firm nature of the egg-shell; A. ... f. O. 1885, pp. 369 & 370: laying more than one egg in the same nest; H. Schalow, Z. ges. Orn. 1885, p. 18: eggs in nests of various birds; H. Fournes, MT. Orn. Ver. Wien, 1885, pp. 178 & 188; A. Walter, *t. c.* pp. 235 & 236.

Dromococcyx gracilis, sp. n., Demerara; R. Ridgway, P. U. S. Nat. Mus. viii. p. 559.

Eudynamis melanorhyncha, stages of plumage; F. H. H. Guillemard, P. Z. S. 1885, p. 550.

Geococcyx californicus, colouration of naked skin-tracts in life; R. W. Shufeldt, Ibis, 1885, pp. 286–288, pl. vii.

Musophagidæ.

Corythaix leucotis in confinement; G. Eismann, Zool. Gart. 1885, pp. 361–363. *C. livingstonii* [J. f. O. 1880, p. 141] should be *C. cabanisi*; G. A. Fischer, *op. cit.* 1885, p. 123. *C. hartlaubi*, *C. schuetti*, *C. livingstonii*, *C. cabanisi*, *C. reichenowi*, figured; H. Schalow, *t. c.* pl. v.

Musophaga boehmi [*cf.* Zool. Rec. xxi. *Aves*, p. 54] = *M. rossæ*, juv.; *id. t. c.* p. 108.

PSITTACI.

An important article on the family, *sub voce* "Parrot"; A. Newton, Encycl. Brit. ed. 9, xviii.

Cacatua gymnopis, *C. ducorpsi*, *C. triton*, *C. opthalmica* figured; J. Gould, Birds N. Guinea, pts. xix. & xx.

Chrysotis tucumana, sp. n., Tucuman, Argentine Rep.; J. Cabanis, J. f. O. 1885, p. 221.

Coracopsis sibilans, sp. n., Grand Comore; A. Milne-Edwards & F. Oustalet, C.R. ci. p. 220.

Cyclopsitta occidentalis figured; J. Gould, Birds N. Guinea, pt. xix.

Cyclopsittacus edwardsi, sp. n., Kafou, N. New Guinea; E. Oustalet, Ann. Sci. Nat. (6) xix. Art 3, p. 1.

Eos insularis, sp. n., Weeda Is., S.E. Halmaheira; F. H. H. Guillemard, P. Z. S. 1885, p. 565, pl. xxxiv.

Loriculus bonapartii = *L. hartlaubi*; *id. t. c.* p. 253.

Nestor sp. n.? or *occidentalis*?; A. Reischek, Tr. N. Z. Inst. xvii. [1884] p. 194.

Platycercus pennanti var. n. *nobbsi*, *fide* E. L. Layard [Ibis, 1881, p. 173], from Norfolk I.; H. B. Tristram, Ibis, 1885, p. 48.

Pœocephalus rufiventris breeding in gigantic ant-hills in Somali-land; G. E. Shelley [E. Lort Phillips' Notes], *t. c.* p. 393.

Prioniturus, tail-feathers, heads, and beaks figured, &c.; W. Blasius, Z. ges. Orn. 1885, pp. 212–218, cuts.

Psittacula andicola, remarks; W. Nation, P. Z. S. 1885, p. 279. *P. cyanochlora*, Natt., MSS., sp. n.? figured, from Rio Brancho, N. Brazil;

G. Hartlaub, *t. c.* p. 615, pl. xxxviii. fig. 2. *P. spengeli*, [illegible] *palpebrosa* [illegible] *guala-* quilla ; *id. t. c.* p. 614, pl. xxxviii. fig. 1.

Psittacus timneh is a good species; J. Büttikofer, Notes Leyd. Mus. vii. p. 212.

Stringops habroptilus, breeding habits ; A. Reischek, Tr. N. Z. Inst. xvii. [1884] p. 195.

Tanygnathus burbidgii is a good species ; F. H. H. Guillemard, P. Z. S. 1885, p. 252.

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Asio otus from Tangier ; S. G. Reid, Ibis, 1885, p. 247.

Bubo blakistoni, type presented to Brit. Mus. ; Edd. *t. c.* p. 455 [*cf.* Zool. Rec. xx., xxi. *Aves*, pp. 19 & 55]. *B. maximus* var. *sibiricus* only occurs east of the Ural Mts. ; remarks on *Bubo turcomanus*, &c. ; M. Menzbier, Ibis, 1885, p. 262.

Carine glaux breeding in gigantic ant-hills in Somali-land ; G. E. Shelley [E Lort Phillips' Notes]. *t. c.* p. 392.

Ketupa javanensis, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxix.

Ninox maculata from Norfolk I. ; J. H. Gurney, Ibis, 1885, p. 139. *N. theomacha* is not identical with *N. goldiei*, as Sharpe considers [*cf.* Zool. Rec. xxi. *Aves*, p. 56]; *id. t. c.* p. 138.

Scops minutus, length of wing ; *id. t. c.* p. 140.

Syrnium uralense, further notes on its nesting in Prussia, egg found in nest with 3 eggs of *Buteo vulgaris*; E. Hartert, MT. orn Ver. Wien, 1885, pp. 7, 8, 19, & 20 ; A. Schmidt, J. f. O. 1885, pp. 82–89 [*cf.* Zool. Rec. xxi. *Aves*, p. 56].

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Sarcorhamphus æquatorialis, Sharpe, probably = *S. gryphus* ; *id. t.* [illegible] pp. 167–171.

Falconidæ.

Aquila chrysaetos, *A. fulva daphanea*, *A. nobilis*, rectrices figured ; M. Menzbier [N. A. Sewertzow], N. Mém. Soc. Nat. Mosc. xv. ii. pl. i. figs. 1–7. *A. amurensis*, ♂ juv. 1st plum., ♂ ♀ ad., figured ; *id. t. c.* pls.

clanga var. *fulvescens*, ♂ juv. & ad. figured ; *id. t. c.* pl. vii. *ti*, juv. 1st plum. and ad. figured ; *id. t. c.* pl. vi. *A. orientalis*, juv. 1st plum., ♀ 3rd plum., ♂ 2nd plum., ♀ ad., figured ; *id. t. c.* pls. iv. & v. *A. fulvescens* is distinct from *A. vindhiana* ; W. E. Brooks [*nec* Sharpe, Cat. Birds Brit. Mus. i. p. 243], Ibis, 1885, p. 386.

Asturina nattereri saturata? new to Brazil ; H. v. Berlepsch & H. v. Jhering, Z. ges. Orn. 1885, p. 109.

Baza ceylonensis, notes communicated by J. H. Gurney ; S. Bligh, Ibis, 1885, p. 362.

Buteo harlani has a light-coloured phase, and may = *B. cooperi* ; R. Ridgway, Auk, ii. pp. 165 & 166 [*cf.* Zool. Rec. xxi. *Aves*, p. 56]. *B. oxypterus*, remarks on type ; *id.* P. U. S. Nat. Mus. viii. pp. 75–77.

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Micrastur jugularis, subsp. n., near *M. guerilla*, Bahia, Venezuela, U. S. Colombia, Brazil ; J. H. Gurney, List Di. Birds Prey (Append. B), pp. 25, 117, & 118 [omitted from Zool. Rec. xxi. *Aves*, p. 57].

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STEGANOPODES.

PHAETHONTIDÆ.

Phaethon rubricauda, breeding habits at Norfolk I. ; W. M. Crowfoot, Ibis, 1885, p. 268.

PELECANIDÆ.

Pelecanus, *sub voce* "Pelican"; A. Newton, Encycl. Brit. ed. 9, xviii.

Sula, the function of the subcutaneous air cells; L. Olphe-Galliard, Ibis, 1885, p. 235. *S. leucogastra*, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxi. *S. personata*, breeding habits at Norfolk I.; W. M. Crowfoot, Ibis, 1885, p. 269.

PHALACROCORACIDÆ.

Phalacrocorax, gen., the nostrils are not connected with the trachea; L. Olphe-Galliard, *t. c.* p. 235. *P. filamentosus* (*capillatus*) is probably a resident in China and Japan; H. Seebohm, *t c.* p. 271. *P. pelagicus* = *P. æolus*, Swinhoe [1867] = *P. bicristatus* (Temm. & Schl, *nec* Pall.) [= *P. urile* (Gm.)]; it summers in N. China, Japan, Kamtschatka, winters in S. China; *id. t. c.* p. 271: head figured; L. Stejneger, Bull. No. 29 U. S. Nat. Mus. [1885] pl. viii. fig 1. *P. perspicillatus* is in all probability extinct on Bering and Commander Is.; *id. t. c.* pp. 180 & 181. *P. urile*, head figured; *id. t. c.* pl. viii. figs. 2 & 3.

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PHŒNICOPTERIDÆ.

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Various species [Japan]; see ULM-ERBACH [BARONESS].

Anas boscas × *A. clypeata* described; V. v. Tschusi zu Schmidhoffen,

1885, pp. 523 & 524. *A. boscas* var. (♂) figured; B. Schia- p. 53, pl. v.

Anser albifrons gambeli [head]; L. Stejneger, Bull. No. 29, U. S. Nat. Mus. [1885] pl. vii. fig. 2. *A. leucopareius*, description, habitat, corrections; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 21 & 22. *A. ruficollis* var.? figured; K. G. Henke, Z. ges. Orn. 1885, pp. 48 & 49, pl. iv. *A. segetum middendorffi* [head]; L. Stejneger, Bull. No. 29 U. S. Nat. Mus. [1885] pl. vii. fig. 1.

Chen hyperboreus new to British lists: H. Saunders, [Yarrell] Hist. Brit. Birds, pp. 275–280, pl.

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Carpophaga rubricera figured; J. Gould, Birds N. Guinea, pt. xix.

Columba livia, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. xc. *C. unicincta* figured; J. Büttikofer, Notes Leyd. Mus. vii. p. 227, pl. vi.

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L. M. Turner corroborates him; *t. c.* p. 117.

Hybrids of Grouse; A. Wiebke, J. f. O. 1885, pp. 393–397.

Bonasa umbellus umbelloides, var. n.? from Manitoba (hardly to be separated, *fide* Ridgway); E. E. T. Seton, Auk, ii. pp. 270 & 271.

Caccabis, sub voce "Partridge"; A. Newton, Encycl. Brit. ed. 9, xviii.

Canace changed to *Dendragapus*; L. Stejneger, P. U. S. Nat. Mus. viii. p. 409.

Colinus ridgwayi, sp. n. [♂], Sasabe [Mexico] and Arizona; W. Brewster, Auk, ii. pp. 199 & 200. [See Stephens, F.]

Coturnix communis [anatomy], see Buchet, G.

Cupidonia pinnata, sp. n. [distinguished from *C. cupido* of Martha's Vineyard, Mass.], Prairies from Illinois westward; W. Brewster, Auk, ii. pp. 80–84.

Lagopus albus, change of colour in the wing-feathers independently of, as well as coincidently with, the moult; C. H. Merriam, *t. c.* pp. 201–203. This tends to cancel the subsp. *L. a. alleni* [*cf.* Zool. Rec. xxi. *Aves*, p. 62]. *L. rupestris* [wrongly determined as *L. albus*] is perhaps the only Ptarmigan of Anticosti; W. Brewster, Auk, ii. p. 221: its characteristics, its habits in Iceland; W. E. Clarke & J. Backhouse, Ibis, 1885, pp. 369 *et seq.*, pl. ix. *L. welchi*, sp. n., Newfoundland; W. Brewster, Auk, ii. pp. 193–195.

Tetrao albo-tetrix (*hybridus*) ♀ figured; K. G. Henke, Z. ges. Orn. 1885, pp. 47 & 48, pl. iii. [it is only a partial albino of *T. tetrix*, ♀]. *T. tetrix* var.; J. E. Harting, Zool. 1885, pp. 41 & 42, pl. i.: ♀ with plumage of ♂; P. M. Wiebke, J. f. O. 1885, pp. 392 & 393. *T. urogallus*, a general account; E. Oustalet, La Nature, 1885, pp. 279, 280, 309, & 310: skull figured, &c.; L. v. Graff, Z. wiss. Zool. xli. pp. 107–114, pl. vii.: deafness during the breeding season [additional remarks]; W. Wurm, *t. c.* pp. 728–730.

Tetraophasis széchenyii, sp. n., described from Szü-csuan; J. v. Madarász, Z. ges. Orn. 1885, pp. 50–52, pl. ii.

PHASIANIDÆ.

The family, *sub vocibus* "Pheasant," "Partridge," "Peacock" [fig.]; A. Newton, Encycl. Brit. ed. 9, xviii.

Lophortyx gambeli × *L. californicus* from Arizona; H. W. Henshaw, Auk, ii. pp. 247–249.

Peloperdix rubrirostris figured; J. F. Snelleman, "Midden Sumatra," *Aves*, pl. iii.

Phasianus principalis, sp. n., Murghab R., Afghanistan; P. L. Sclater, P. Z. S. 1885, pp. 322–324, pl. xxii.

Pternistes bochmi, sp. n., Gonda, Kakoma, Inner E. Africa; P. Matschie, J. f. O. 1885, p. 465.

Rollulus rouloul, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxxv.

MEGAPODIIDÆ.

Megapodius brenchleyi?, its breeding habits at Savo, Solomon Is.; A. H. Kissack, P. R. Soc. Queensl. i. pp. 181–185.

TURNICIDÆ.

Turnix powelli, sp. n., I. of Sumbawa; F. H. H. Guillemard, P. Z. S. 1885, p. 511, pl. xxix.

OPISTHOCOMI.

OPISTHOCOMIDÆ.

Opisthocomus cristatus is said to use its forelimbs as legs for several days after being hatched; E. M. Brigham, Ibis, 1885, p. 118.

FULICARIÆ.

RALLIDÆ.

Aramides cayennensis, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxiv.

Crex pratensis [anatomy], see BUCHET, G.

Fulica atra; *id.*

Notornis hochstetteri (*mantelli*) figured and redescribed; A. B. Meyer, Z. ges. Orn. 1885, pp. 45–47, pl. i.

Porzana leucogastra, Ridg., MS., sp. n., Los Sábalos, Nicaragua; C. C. Nutting, P. U. S. Nat. Mus. vi. [1883] p. 408. *P. leucopyrrha* new to Brazil; H. v. Berlepsch & H. v. Jhering, Z. ges. Orn. 1885, p. 109.

Rallicula rubra figured; F. H. H. Guillemard, P. Z. S. 1885, p. 664, pl. xxxix.

ALECTORIDES.

Psophiidæ, Cariamidæ, Otididæ.

Psophia crepitans, *Cariama cristata*, skeletons figured; A. B. Meyer, Abbild. Vogel-skel, pls. lxxvi. & lxxv.

Otis tetrax, first record of breeding in Mark Brandenburg; H. Schalow, Z. ges. Orn. 1885, p. 9.

LIMICOLÆ.

Charadriidæ.

The family, *sub voce* "Plover"; A. Newton, Encycl. Brit. ed. 9, xix.

Ægialitis occidentalis, *Æ. mechowi*, *Æ. gracilis*, *Æ. venusta*, *Æ. bifrontata* figured; auctt. varr., J. f. O. 1885, pl. vi. *Æ. vocifera*, second occurrence in Britain; H. E. Dresser, P. Z. S. 1885, p. 835 [Tresco, Scilly]; T. Cornish, Zool. 1885, p. 113.

Cursorius gallicus somalensis, subsp. n., Somali-land [E. Lort Phillips]; G. E. Shelley, Ibis, 1885, pp. 415 & 416.

Glareola, *sub voce* "Pratincole"; A. Newton, Encycl. Brit. ed. 9, xix. *G. grallaria*, habits and breeding; K. H. Bennett, P. Linn. Soc. N. S. W. x. pp. 168 & 169. *G. megapoda* described, with an account of its nest and eggs; J. Büttikofer, Notes Leyd. Mus. vii. pp. 233–235 & 256 (supplementary).

Hæmatopus, *sub voce* "Oyster-catcher"; A. Newton, Encycl. Brit. ed. 9, xviii.

Chionididæ.

Chionis alba (head); Pagenstecher, Vögel Süd-Georgiens, fig.

Scolopacidæ.

Actodromas maculata, its eggs and breeding habits; J. Murdoch, Exped. to Pt. Barrow, Alaska, p. 111: egg figured for the first time Seebohm, Hist. Brit. Birds, iii. pp. 201–203, pl. lxviii.

Scolopax rusticola in the Austrian Empire; A. Kotz, MT. orn. Wien, 1885, pp. 154, 163, & 171.

Totanus calidris new to Japan; H. Seebohm, Ibis, 1885, p. 363. *T. glareola* added to the list of Irish Birds; A. G. More, Zool. 1885, p. 438. *T. solitarius* from Marazion, Cornwall; T. Cornish, *t. c.* p. 113.

Tringa canutus, its egg asserted to have been found at Fort Conger by Lieut. Greely; C. H. Merriam, Auk. ii. p. 313: it was taken from the ovary in a completely formed state; H. W. Feilden, Zool. 1885, p. 387 [*cf. t. c.* p. 344]. *T. pectoralis*, see *Actodromas*.

GAVIÆ.

Laridæ.

Laridæ [of the Californian coast]; H. W. Henshaw, Auk, ii. pp. 231 & 232.

Anous stolidus and *A. cinereus*, breeding habits at Norfolk I.; W. M. Crowfoot, Ibis, 1885, pp. 264 & 265. *A. melanogenys* breeds in colonies on the branches of the white oak (*Lagunaria patersoni*) at Norfolk I.; *id. t. c.* p. 264.

Gygis candida breeds singly on the white oak (*Lagunaria patersoni*), the iron-wood (*Notelæa longifolia*), and the blood-wood (*Baloghia lucida*), without any nest, at Norfolk I.; *id. t. c.* pp. 266–268.

Larus kamtschatchensis (head); L. Stejneger, Bull. No. 29 U. S. Nat. Mus. 1885, pl. vi. fig. 4. *L. kumlieni* ? from Alaska; J. Murdoch, Exped. to Pt. Barrow, p. 123 [see also Harvie-Brown, J. A.]. *L. pomarœ*, breeding habits; T. H. Potts, Zool. 1885, pp. 148–150. *L. schistisagus* (head); L. Stejneger, Bull. No. 29 U. S. Nat. Mus. 1885, pl. vi. fig. 3.

Rhodostethia rosea not uncommon as an autumn visitant; J. Murdoch, Exped. to Pt. Barrow, Alaska, pp. 123–125, pls. i. & ii. [The writer describes a very rosy state of plumage from freshly killed specimens; and also the plumage of immature birds of the year, which has never been done with perfect certainty before, on account of the absence of dates.]

Stercorarius cephus, *S. pomarinus* in Austria; J. Talsky, J. f. O. 1885, pp. 162–165.

Sterna bergii, skeleton figured; A. B. Meyer, Abbild. Vogel-skel. pl. lxxii. *S. fuliginosa*, breeding habits at Norfolk I.; W. M. Crowfoot, Ibis, 1885, p. 266.

Xema sabinii, type presented to Brit. Mus.; Edd. *t. c.* p. 455 [*cf.* Yarrell (Saunders) iii. p. 575]; specimen shot at Seaham Harbour, Durham; J. Hancock, Tr. North Durh. 1884, pp. 27 & 28. [See also Harvie-Brown, J. A.]

TUBINARES.

Procellariidæ.

The family, *sub voce* "Petrel"; A. Newton, Encycl. Brit. ed. 9, xviii.

Diomedea brachyura, variations in form of beak during its growth; P. W. Shufeldt, Auk, ii. pp. 175–178, 4 cuts. The author is of opinion that the Albatross does not moult any part of the horn of the bill, as the *Alcidæ* do, though the beak becomes comparatively deeper in the adult.

Fulmarus glacialis glupischa (heads); L. Stejneger, Bull. No. 29 U. S. Nat. Mus. [1885], pl. vi. figs. 1 & 2.

Œstrelata fisheri and *Œ. defilippiana*, distinctions; R. Ridgway, P. U. S. Nat. Mus. viii. pp. 17 & 18.

Pagodroma nivea (head); Pagenstecher, Vögel Süd-Georgiens, pl.

Pelagodroma marina new for N. America (Atlantic); *palpebrosa* ... *guala-* Auk, ii. pp. 386 & 387.

Puffinus sphenurus and *P. assimilis*, breeding habits at Norfolk I.; W. M. Crowfoot, Ibis, 1885, pp. 268 & 269.

PYGOPODES.

Colymbidæ.

Colymbus adamsi, occurrences in Britain; H. Seebohm, Zool. 1885, pp. 144 & 145.

Alcidæ.

Heads of various species figured [see Stejneger, L.].

Alca impennis [see Blasius, W., Grieve, S.].

Ceratorhina monocerata, the horny appendage of the beak; H. W. Henshaw, Auk, ii. pp. 387 & 388.

Uria brünnichi, its eggs; A. Fridolin, SB. Ges. Dorp. 1884, pp. 418 & 419.

IMPENNES.

Spheniscidæ.

The family, *sub voce* "Penguin"; A. Newton, Encycl. Brit. ed. 9, xviii.

Eudyptes pachyrhynchus and *Eudyptula minor*, breeding habits; A. Reischek, Tr. N. Z. Inst. xvii. [1884] pp. 193 & 194.

RATITÆ.

APTERYGES.

Apterygidæ.

Apteryx australis, *A. oweni*, the right auriculo-ventricular valve of the heart does not differ from that of other birds, as Owen stated in 1841; F. E. Beddard, P. Z. S. 1885, pp. 188 & 189. *A. australis*, heart is of the avian type, not of the type of *Monotremata*; E. Ray Lankester, *t. c.* pp. 239 & 240: the opposite view restated; R. Owen, *t. c.* pp. 328 & 329: the result of the controversy; *t. c.* pp. 477–482. *A. australis*, *A. oweni*, breeding habits; A. Reischek, Tr. N. Z. Inst. xvii. [1884] pp. 191 & 192.

IMMANES.

Dinornithidæ.

Dinornis, remains from Tengawai R., Canterbury; W. W. Smith, N. Z. J. Sci. 1884, pp. 293–295.

sp. ?, its remains in the Mackenzie Country and other [illegible]; C. Chapman, Tr. N. Z. Inst. xvii. pp. 172–178 [1884]. *D. oweni*, sp. n., Whangarei, N. Z.; J. v. Haast, P. Z. S. 1885, p. 482.

RHEÆ.

Rheidæ.

Rhea darwini, eggs and nesting habits; *R. macrorhyncha*, supposed eggs, their identification doubtful; P. L. Sclater [G. Claraz], P. Z. S. 1885, pp. 324–327. *R. darwini* differs considerably from *R. americana* and *R. macrorhyncha*, whilst the latter two species offer apparently few important characters for separation. However, no matter if the number of the neck vertebræ of *R. macrorhyncha* (16 instead of 15) be a constant character or not, the differences in the proportions of the skulls afford an anatomical distinction just as good as those which induce us to consider *R. darwini* a so-called good species. The relative differences of the length of wings and legs to one another, as well as to those of the other species, lead to some interesting conclusions, and the additional cervical vertebra in the one species is discussed from a broad morphological point of view; H. Gadow, P. Z. S. 1885, pp. 308–322.

STRUTHIONES.

Struthionidæ.

Struthio, sub voce "Ostrich"; A. Newton, Encycl. Brit. ed. 9, xviii. fig.: ostrich farm at Zéralda (Algeria); A. Laloue, Bull. Soc. Acclim. 1885, pp. 665–667. *S. camelus*, *S. molybdophanes*, *S. australis*, the microscopic texture of the eggs as a mark of distinction; W. v. Nathusius, J. f. O. 1885, pp. 165–178, pls. ii. & iii.

SAURURÆ.

Archæopteryx.

[See Vetter, B.]

Forma incertæ sedis.

Gastornis klaasseni, sp. n. [fossil], Croydon; E. T. Newton, P. Z. S. 1885, pp. 445 & 446. This species exhibits anserine characters in the tibio-tarsus.

REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER.

GENERAL.

KINGSLEY, J. S. The Standard Natural History. Vol. iii. Lower Vertebrates. Boston: 1885, 8vo, with numerous illustrations.

Batrachia, by E. D. Cope, pp. 303-344. *Reptilia*, by H. C. Bumpus, pp. 345–468.

CAMERANO, L. Ricerche intorno alla Distribuzione dei Colori nel Regno Animale. Mem. Acc. Tor. (2) xxxvi. pp. 329–360, pls. i & ii.

Reptiles and Batrachians, pp. 349 & 350.

GASKELL, W. H., & GADOW, H. On the Anatomy of the Cardiac Nerves in certain Cold-Blooded Vertebrates. J. Physiol. v. pp. 362–372, pl. xi.

Chelonia, *Crocodilia*, *Rana*.

SOLGER, B. Zur Kenntniss der Krokodilierniere und der Nierenfarbstoffe niederer Wirbelthiere. Z. wiss. Zool. xli. pp. 605–615, pl. xxxii.

A. W. BUTLER has notes on the hibernation of Tortoises and Batrachians. Am. Nat. xix. pp. 37–40, and P. Am. Ass. xxiii. pp. 543–545.

MÜLLER, F. Vierter Nachtrag zum Katalog der herpetologischen Sammlung des Basler Museums. Verh. Ges. Basel, vii. pp. 668–717.

The number of species of Reptiles and Batrachians in the Basle Museum (in January, 1885) amounted to 1294. Several species are described as new.

FAUNÆ.

EUROPE.

CAMERANO, L. Ricerche intorno alla Distribuzione Geographica degli Anfibi Anuri in Europa. Atti Acc. Tor. xviii. [1883] pp. 274–286, pl. iii.

——. Ricerche intorno alla Distribuzione Geographica degli Anfibi Urodeli in Europa. *Op. cit.* xx. pp. 791–797.

Friedel, E. Eintheilungs-Plan der Zoologischen A[illegible] palpebrosa guala- Märkischen Provincial-Museum der Stadtgemeinde Ber[illegible] u. Kriechthiere. Berlin: 1885, 8vo, 15 pp.

A list of the Reptiles and Batrachians of the Province of Brandenburg.

Seoane, V. L. Identidad de *Lacerta Schreiberi* (Bedriaga) y *Lacerta viridis* var. *Gadovii* (Boulenger), é investigaciones herpetológicas de Galicia. La Coruña: 1884 [issued 1885], 8vo, 19 pp.

Contains a list of the Reptiles and Batrachians of Galicia.

Boscá, E. Exploracion herpetológica de la Isla de Ibiza. An. Soc. Esp. xii. [1883] pp. 241–250.

A new variety of Wall-Lizard was discovered.

L. Camerano, Zool. Anz. viii. pp. 417–419, gives a list of the Italian *Lacertilia*.

Camerano, L. Monografia degli Anfibi Urodeli Italiani. Mem. Acc. Tor. (2) xxxvi. pp. 405–486, pls. xxxvi. & xxxvii.

Asia.

Boettger, O. Liste der von Herrn O. Retowski in Abchasien gesammelten Reptilien und Batrachier. Ber. senck. Ges. 1884, pp. 144 & 145.

7 species.

——. Materialien zur herpetologischen Fauna von China. 1. Ber. offenb. Ver. xxiv. & xxv. pp. 115–170.

1. Liste der ersten Möllendorff'schen Sendung südchinesischer Kriechthiere; pp. 115–131. [A new Snake is described.] 2. Versuch einer Aufzählung der Reptilien und Batrachier des Chinesischen Reiches; pp. 132–170.

*Tirant, G. Notes sur les Reptiles et les Batraciens de la Cochinchine et du Cambodge. Saïgon: 1885, 8vo, 104 pp.

A. A. W. Hubrecht, in Midden-Sumatra, part i., gives a list (9 pp.) of Reptiles and Batrachians from Sumatra.

Fischer, J. G. Ueber eine Kollektion Reptilien und Amphibien von der Insel Nias. Extract from Abh. Ver. Hamb. ix., 7 pp.

Boulenger, G. A. A List of Reptiles and Batrachians from the Island of Nias. Ann. N. H. (5) xvi. pp. 388 & 389.

Fischer, J. G. Ueber eine Kollection von Amphibien und Reptilien aus Südost-Borneo. Arch. f. Nat. li. pp. 41–72, pls. iv. & v.

A list of 61 species, 5 of which are described as new, and 4 recorded for the first time from Borneo.

J. G. Fischer, JB. Hamb. ii. pp. 80 & 81, gives a list of Reptiles and Batrachians from Mindanao. 4 species described as new.

Africa.

O. Boettger, in an Appendix to Kobelt's Reiseerinnerungen aus Algerien und Tunis [Frankfort (Main): 1885], gives a list (pp. 457–475) of Reptiles and Batrachians from Algeria and Tunis, with notes.

*Greef, R. Die Fauna der Guinea-Inseln S. Thomé und Rolas. SB. Ges. Marb. 1884, pp. 41–79.

Bœttger, O. Materialien zur Fauna des unteren Congo. I. *a*. Reptilien. Ber. offenb. Ver. xxiv. & xxv. pp. 171–186.

Notes on 8 species of Reptiles.

Vaillant, L. Catalogue raisonné des Reptiles et Batraciens d'Assinie, donnés par M. Chaper au Muséum d'Histoire Naturelle. Bull. Soc. Z. Fr. ix. pp. 343–354, pl. xii. [*Cf.* Zool. Rec. xxi. *Rept.* p. 3.]

——. Sur quelques Batraciens de Nossi-Bé (Madagascar) appartenant à la Collection du Muséum. Bull. Soc. Philom. (7) ix. pp. 115–118.

America.

Cragin, F. W. Recent Additions to the List of Kansas Reptiles and Batrachians, with Further Notes on Species Previously Reported. Bull. Washb. Coll. i. pp. 100–103.

——. Notes on some South-Western Reptiles in the Cabinet of Washburn College. *T. c.* pp. 6–8.

Cope, E. D. Twelfth Contribution to the Herpetology of Tropical America. P. Am. Phil. Soc. xxii. pp. 167–194, pl.

I. On a collection from Monterey, Nuevo Leon, Mexico (p. 169). II. Jalapa, Vera Cruz (pp. 169–171). III. Notes on Central American and Mexican *Batrachia* and *Reptilia*. IV. Aruba, Leeward Islands (pp. 180 & 181). V. Curaçao (pp. 181 & 182). VI. Nicaragua (pp. 182 & 183). VII. Upper Beni River, Bolivia (pp. 184 & 185). VIII. Rio Grande do Sul, Brazil (pp. 185–194). Critical remarks on this paper by Boulenger: Ann. N. H. (5) xvi. pp. 294–298.

Godman, F. D., & Salvin, O. Biologia Centrali-Americana. *Reptilia*, by A. Günther.

The text to p. 56, and the first 25 plates were issued in the course of the year. *Chelonia*, *Crocodilia*, and part of the *Lacertilia*.

Cope, E. D. A Contribution to the Herpetology of Mexico. P. Am. Phil. Soc. xxii. pp. 379–404.

I. The collection of the Comision cientifica (pp. 379–382). II. Zacualtipan (pp. 382–386). III. General notes (pp. 386 & 387). IV. Cozumel Island (pp. 387–390). V. Notes on Anoles (pp. 390–393). VI. A synopsis of the Mexican species of the genus *Sceloporus* (pp. 393–403). Appendix on a collection from New Providence, Bahama Islands (p. 403).

SUMICHRAST, F. Enumeracion de las Especies de Reptile[s] palpebrosa [de] la parte meridional de la República Mexicana. Nat. Mex. vi. [1]–[2] pp. 31–45.

A list of 11 *Chelonia*, 5 *Crocodilia*, 52 *Lacertilia*, 68 *Ophidia*.

——. Enumeracion de los Batracios observados en la parte oriental y meridional de la República Mexicana. *T. c.* pp. 78–84.

1 Apode, 8 *Caudata*, 32 *Ecaudata*. Contains various synonymic notes.

BOULENGER, G. A. A List of Reptiles and Batrachians from the Province Rio Grande do Sul, Brazil, sent to the Natural History Museum by Dr. H. von Ihering. Ann. N. H. (5) xv. pp. 191–196.

47 species are enumerated, 3 of which are given as new.

——. Second List of Reptiles and Batrachians from the Province Rio Grande do Sul, &c. *Op. cit.* xvi. pp. 85–88.

14 species are added, 3 being new; a new genus is established.

BOETTGER, O. Liste von Reptilien und Batrachiern aus Paraguay. Z. Naturw. lviii. pp. 213–2[illegible]8.

44 Reptiles and 19 Batrachians are enumerated, with notes, and several species are described as new, some of which are, however, withdrawn in an additional paper, *t. c.* pp. 436 & 437.

PALÆONTOLOGICAL.

COPE, E. D. Fifth Contribution to the Knowledge of the Fauna of the Permian Formation of Texas and the Indian Territory. P. Am. Phil. Soc. xxii. pp. 28–47, pl. i.

DOLLO, L. Les Iguanodons de Bernissart. Rev. Quest. Sci. xviii. pp. 5–55.

This paper deals not only with the subject indicated in the title, but is a general review of the discoveries made in connection with the Wealden of Bernissart.

DUPONT, E. Sur de nouveaux groupes d'ossements fossiles, provenant du terrain crétacé supérieur et du terrain éocène inférieur de la Belgique. Bull. Ac. Belg. (3) x. pp. 576–578.

COPE, E. D. The *Vertebrata* of the Tertiary Formation of the West. Rep. U. S. Geol. Surv. iii. 1884 [issued 1885], xxxiv. & 1009 pp., 134 pls.

Batrachia (remains of a probably incompletely developed, unnamed, tailless form), p. 100; *Reptilia*, pp. 101–166, pls. xv.–xxxiii.*b*.

LYDEKKER, R. The *Reptilia* and *Amphibia* of the Maleri and [illegible] Groups. Pal. Ind. (4) i. pt. 5, 38 pp., 6 pls. [illegible]and

REPTILIA.

COPE, E. D. On the Evolution of the *Vertebrata*, Progressive and Retrogressive. VI. The Reptilian Line. Am. Nat. xix. pp. 245–247 & 341–344.

The *Reptilia* are divided into the following 10 orders:—*Ichthyopterygia*, *Theromorpha*, *Dinosauria* (including *Crocodilia*), *Ornithosauria*, *Testudi-*

... *Aëphalia*, *Sauropterygia*, *Lacertilia*, *Pythonomorpha* (including *Chamæsiodera*), and *Ophidia*.

Bronn, H. G. Klassen und Ordnungen des Thierreichs. vi. Abth. iii. *Reptilia*, by C. K. Hoffmann.

Lief. 44–49, pp. 1425–1568. Anatomy of the *Ophidia*.

Günther, A. Guide to the Gallery of Reptilia in the Department of Zoology of the British Museum (Natural History). London : 1885, 8vo, 30 pp., figs.

Hoffmann, C. K. Weitere Untersuchungen zur Entwicklungsgeschichte der Reptilien. Morph. JB. xi. pp. 176–219, pls. x.–xii.

Lwoff, W. Beiträge zur Histologie der Haut der Reptilien. Bull. Mosc. lix. pp. 313–334, pl. vi.

On the skin of Crocodiles and *Hatteria*.

Baur, G. Zur Morphologie des Carpus und Tarsus der Reptilien. Vorläufige Mittheilung. Zool. Anz. viii. pp. 631–638.

Fürbringer, M. Ueber das Schulter- und Ellbogengelenk bei Vögeln und Reptilien. Morph. JB. xi. pp. 118–120.

ORNITHOSAURIA.

Rhamphorhynchus longicaudatus, Münst. Description of a specimen preserved in the collection of the Natural History Society of Regensburg; L. v. Ammon, CB. Ver. Regensb. xxxviii. [1884] pp. 129–168, pls. i. & ii.

O. Meyer, Z. geol. Ges. xxxvi. p. 664, is inclined to regard the fragment described by Koken as *Ornithocheirus hilsensis* as the distal extremity of a phalanx of a Carnivorous Dinosaur. Reply by Koken, *op. cit.* xxxvii. p. 214. S. W. Williston, Zool. Anz. viii. p. 628, endorses Meyer's opinion.

DINOSAURIA.

G. Baur, Zool. Anz. viii. pp. 441–443, remarks that Cope, and not Huxley, was the first to point out the relationship between Dinosaurs ... by ds.

The ...er, B. Ueber die Verwandtschaftsbeziehungen zwischen Dinosauriern und Vögeln. Festschr. Ges. Isis, 1885, pp. 109–122.

A review of the hypotheses hitherto put forward, followed by the expression of the author's own views on the relationship of Dinosaurs and Birds.

Marsh, O. C. On the Classification and Affinities of Dinosaurian Reptiles. Rep. Brit. Ass. 1884, pp. 763–766; also Nature, xxxi. pp. 68 & 69.

Baur, G. Bemerkungen über das Becken der Vögel und [illegible] Morph. JB. x. pp. 613–616.

On teeth of *Craspedodon lonzeensis*, Dollo, and of other herbivorous Dinosaurs; Dollo, Ann. Soc. Brux. ix. pp. 309–318, figs.

Iguanodon. J. W. Hulke identifies the bones regarded as sternals by Dollo, as clavicles; a specimen is figured in support of this view: Q. J. Geol. Soc. xli. pp. 473–475, pl. xiv. Refutation of Hulke's identification by Dollo, Rev. Quest. Sci. xviii. pp. 664–675, and Baur, Zool. Anz. viii. pp. 561 & 562. On a fragment of *Iguanodon* humerus from Stadthagen, Germany; Dames, Z. geol. Ges. xxxvi. [1884] p. 186. On the recently restored specimen of *Iguanodon mantelli*, in the Brussels Museum; H. Woodward, Geol. Mag. (3) ii. pp. 10–15, pl. i.

Diclonius mirabilis. Note on the ankle and a portion of the integument from the pelvic region; the scales resemble considerably the divisions of the skin of *Rhinoceros sondaicus*: Cope, Am. Nat. xix. p. 1208.

Camptosaurus, n. n. for *Camptonotus*, Marsh; Marsh, Am. J. Sci. (3) xxix. p. 169.

Anchisaurus, n. n. for *Amphisaurus*, Marsh; *id. ibid*

On *Megalosaurus* remains from the Oxfordian marl of Dives and Villers, France: Douvillé, Bull. Soc. géol. (3) xiii. p. 441.

Lydekker, Pal. Ind. (4) i. pt. 5. pp. 25–29, describes some undetermined Dinosaurian remains from the Maleri and Denwa groups.

THEROMORPHA.

E. D. Cope, P. Am. Phil. Soc. xxii. pp. 43–46, writes on the relation of the characters of the Pelycosaurian suborder of the *Theromorpha* to those of the *Mammalia*, and expresses the opinion that the latter are descendants of the former. The author also describes the structure of the hind foot in the *Pelycosauria* (pp. 38–41), of the columella auris in *Clepsydrops leptocephalus* (pp. 41 & 42), of the quadrate bone in the genus *Clepsydrops* (pp. 42 & 43), and the articulation of the ribs in *Embolophorus* (p. 43).

Clepsydrops leptocephalus, p. 30, and *macrospondylus*, p. 35, spp. nn., *id. t. c.*, Permian of Texas.

Edaphosaurus microdus, sp. n., *id. t. c.* p. 37, Permian of Texas.

Cope, E. D. The Relations between the Theromorphous Reptiles and the Monotreme *Mammalia*. P. Am Ass. xxxiii. pp. 471–481, pl. —.

On a Dicynodont recently discovered at New Spynie, near Elgin; Traquair, Nature, xxxii. p. 556.

CHELONIA.

Lydekker, R. Siwalik and Narbada *Chelonia*. Pal. Ind. (10) iii. pt. 6, pp. 155–210, pls. xviii.–xxvii.

Atti Acc. Tor. xx. pp. 1095-1110, pl. xi., describes tertiary Pliocenian remains from Italy.

A synopsis of the recent and extinct families and genera of Cryptodire Tortoises and Turtles; Cope, Rep. U. S. Geol. Surv. iii. pp. 111–113.

Mills, T. W. The Innervation of the Heart of the Slider Terrapin (*Pseudemys rugosa*). J. Physiol. vi. pp. 246-286.

Pilliet, A., & Bignon, F. Sur la glande lacrymale d'une Tortue géante (*Chelone viridis*). Bull. Soc. Z. Fr. x. pp. 60–66.

Kronecker, H., & Mills, T. W. On the Cardiac Nerves of the Turtle. Rep. Brit. Ass. 1884, p. 776.

Testudo. On remains of the gigantic fossil Tortoises of Madagascar, *T. abrupta*, Grand., and *T. grandidieri*, sp. n., = *Emys gigantea*, Grand.; Vaillant, C.R. c. pp. 874–877. *T. yniphora*, sp. n., *id. op. cit.* ci. p. 440, and Bull. Soc. Philom. (7) ix. p. 118, Comoro or Aldabra Is.?

Emys ornata, Gray, pl. i., *umbra*, Bocourt, pls. iv.–vi. fig. A, and *pulcherrima*, Gray, pls. vii. & viii., figured by Günther, Biol. Centr. Am. *E. cataspila*, p. 4, pl. vi. fig. B, Mexico, and *salvini*, p. 4, pls. ii. & iii., Guatemala, spp. nn., *id. t. c.* *E. brevicostata*, sp. n. (foss.), Portis, Mem. Acc. Tor. (2) xxxv. [1883], p. 369, pl. i. figs. 1 & 2, Pliocene of Piedmont. *E. shaughnessiana*, sp. n. (foss.), Cope, Rep. U. S. Geol. Surv. iii. p. 135, pl. xxiii. figs. 3–6, Tertiary of Cottonwood Creek, Wyoming.

Clemmys sarmatica, sp. n. (foss.), Purschke, Anz. Ak. Wien, 1885, p. 36, and Denk. Ak. Wien, l. p. 185, pl. —, Marl of Hernaes, near Vienna. *C. hydaspica*, p. 172, *theobaldi*, p. 173, *punjabiensis*, p. 175, and *palæindica*, p. 178, spp. nn. (foss.), Lydekker, *t. c.*

Batagur falconeri, p. 187, *bakeri*, p. 190, *durandi*, p. 192, and *cautleyi*, p. 194, spp. nn. (foss.), Lydekker, *t. c.*

Cinosternum cruentatum, A. Dum., pls. ix.–xi., *hirtipes*, Wagl., pls. xii.–xv., and *leucostomum*, A. Dum., pls. xvi. & xvii., figured by Günther, *t. c.* *C. brevigulare*, sp. n., *id. t. c.* p. 17, pl. xviii. fig. A, Playa Vicente, Mexico. *C. brevigulare*, sp. n., Cope, P. Am. Phil. Soc. xxii. p. 389, Costa Rica [Günther's name has priority.—Rec.].

Chelodina longicollis, Shaw, figured by McCoy, Prodr. Zool. Vict., Dec. x. pls. xcii. & xciii.

by *lineata*, p. 199, *sivalensis*, p. 199, and *palæindica*, p. 201, spp. nn. Theydekker, *t. c.*

Trionyx anthracotheriorum, sp. n. (foss.), Portis, Mem. Acc. Tor. (2) xxxv. [1883] p. 375, pls. i. fig. 4, & ii., Miocene of Piedmont.

Aspilus cortesii, sp. n. (foss.), *id.* Atti Acc. Tor. xx. p. 1105, pl. xi. figs. 2 & 3, probably from Montezago, Italy.

Sphargis coriacea, L., figured by McCoy, Prodr. Zool. Vict., Dec. xi. pl. ci.

Protosphargis veronensis, Cap. Description and figures; Capellini, Atti Acc. Rom. xviii. pp. 291–320, 7 pls.

pl. vii. fig. 4, New Hebrides, and *guentheri*, p. 90, pl. vii. fig. [illegible] spp. nn., *id. t. c.* *P. julieni*, sp. n., Cope, P. Am. Phil. Soc. xxii. [illegible] Aruba, Leeward Is.

Ebenavia boettgeri, sp. n., Boulenger, Cat. Liz. i. p. 96, pl. viii. fig. 1, Madagascar.

Diplodactylus tessellatus, Gthr., figured; *id. t. c.* pl. viii. fig. 6. *D. ciliaris*, p. 98, pl. viii. fig. 2, Port Darwin, *steindachneri*, p. 102, pl. viii. fig. 5, Sydney, spp. nn., *id. t. c.*

Œdura tryoni, sp. n., De Vis, P. R. Soc. Queensl. i. [1884] p. 54, Queensland, = *Œ. ocellata*, sp. n., Boulenger, *t. c.* p. 105, pl. ix. fig. 1; *id.* Ann. N. H. (5) xvi. p. 387. *Œ. fracticolor*, sp. n., De Vis, *t. c.* p. 160, Kimberley, Gulf of Carpentaria. *Œ. robusta*, sp. n., Boulenger, *t. c.* p. 106, pl. x. fig. 1, Australia.

Thecadactylus australis, Gthr., figured; *id. t. c.* pl. xi. fig. 1.

Hemidactylus reticulatus, Bedd., pl. xi. fig. 2, *echinus*, O'Sh., fig. 3, *fasciatus*, Gray, fig. 4, and *richardsonii*, Gray, pl. xii. fig. 3, figured; *id. t. c.* *H. longicephalus*, Bocage, renamed *H. bocagii*; *id. t. c.* p. 125. *H. sinaitus*, p. 126, Mt. Sinai, *stellatus*, p. 130, pl. xii. fig. 1, Gambia, and *blanfordii*, p. 141, Darjeeling, spp. nn., *id. t. c.* *H. navarri*, sp. n., A. Duges, Nat. Mex. vi. [1883] p. 309, pl. vii., San Blas, Mexico [= *Gehyra mutilata*, Wgm.—Rec.].

Aristelliger irregularis, sp. n., Cope, *t. c.* p. 387, Cozumel I. [= *A. præsignis*, Hall.—Rec.].

Perochirus, g. n., for *Hemidactylus ateles*, A. Dum., and allies; Boulenger, Cat. Liz. i. p. 154. *P. guentheri*, sp. n., *id. t. c.* p. 155, pl. xii. fig. 4, Erromango.

Spathoscalabotes, n. n. for *Spathodactylus*, Gthr., *nec* Pictet; *id. t. c.* p. 156. *S. mutilatus*, Gthr., figured; *id. t. c.* pl. xiii. fig. 1, and (from Sumatra) by Hubrecht, Midden-Sumatra, *Rept.* pl. —, fig. 2.

Microscalabotes cowani, Blgr., figured; Boulenger, *t. c.* pl. xiii. fig. 2.

Lepidodactylus aurantiacus, Bedd., fig. 4, and *cyclurus*, Gthr., fig. 6, figured; *id. t. c.* pl. xiii. *L. ceylonensis*, p. 164, pl. xiii. fig. 3, Ceylon, and *pulcher*, p. 166, pl. xiii. fig. 5, Admiralty Is., spp. nn., *id. t. c.*

Hoplodactylus maculatus, Gray, pl. xiv. fig. 1, *granulatus*, Gray, pl. xv. fig. 1, and *anamallensis*, Gthr., pl. xiv. fig. 2, figured; *id. t. c.*

Luperosaurus cumingii, Gray, figured; *id. t. c.* pl. xv. fig. 2.

Gecko pumilus, sp. n., *id.* Ann. N. H. (5) xvi. p. 473, Murray I.

Homopholis, g. n., for *Gecko wahlbergii*, Smith; *id.* Cat. Liz. i. p. 191. *H. macrolepis*, sp. n., *id.* Ann. N. H. (5) xvi. p. 474, Delagoa Bay.

Tarentola ephippiata, O'Sh., figured; *id.* Cat. Liz. i. pl. xvi. fig. 1. *T. senegalensis*, sp. n., *id. t. c.* p. 414, Senegambia.

Pachydactylus formosus, Smith, fig. 2, *maculatus*, Gray, fig. 4, *meng[illegible] marginatus*, Smith, fig. 5, and *mariquensis*, Smith, fig. 6, figured; *id. t. c.* pl. xvi. *P. oshaughnessyi*, sp. n., *id. t. c.* p. 204, pl. xvi. fig. 3, Lake Nyassa.

Phelsuma newtonii, Blgr., pl. xvii., and *lineatum*, Gray, pl. xviii. fig. 1, figured; *id. t. c.* *P. guentheri*, sp. n., *id. t. c.* p. 213, Round I., near Mauritius.

Rhoptropus ocellatus, sp. n., *id.* Ann. N. H. (5) xvi. p. 475, Cape Town.

Aylus nigropunctatus, Gray, fig. 2, *argus*, Gosse, fig. 5, and *Richardsonii*, Gray, fig. 6, figured; *id.* Cat. Liz. i. pl. xviii.

Eublepharidæ.

Eublepharis fasciatus, sp. n., Boulenger, Cat. Liz. i. p. 234, Ventanas, Mexico.

Pygopodidæ.

Cryptodelma orientalis, Gthr., figured by Boulenger, Cat. Liz. i. pl. xix.

Agamidæ.

Draco guentheri, p. 257, pl. xx. fig. 2, and *everetti*, p. 258, fig. 3, spp. nn., Boulenger, Cat. Liz. i., Philippines. *D. major*, Blanf., *nec* Laur., renamed *D. blanfordii*; *id. t. c.* p. 267.

Otocryptis beddomii, sp. n., *id. t. c.* p. 272, pl. xxii. fig. 1, Sevagherry Ghat, S. India.

Lophocalotes interruptus, Gthr., occurs in Sumatra; Hubrecht, Midden-Sumatra, *Rept.* p. 4.

Harpesaurus, n. n. for *Arpephorus*, A. Dum., *nec* Fischer de Waldh.; Boulenger, *t. c.* p. 279.

Phoxophrys tuberculata, Hubr., figured by Hubrecht, *t. c.* pl. —, fig. 3.

Gonyocephalus interruptus, sp. n., Boulenger, *t. c.* p. 290, pl. xxi., Mindanao.

Acanthosaura armata, Gray, pl. xxii. fig. 1, *minor*, Gray, pl. xxiii. fig. 2, and *major*, Jerd., pl. xxiii. fig. 3, figured; *id. t. c.* *A. crucigera*, fig. 2, and *lamnidentata*, fig. 3, spp. nn., *id. t. c.* p. 302, pl. xxii., Burma.

Japalura variegata, Gray, fig. 1, and *planidorsata*, Jerd., fig. 2, figured; *id. t. c.* pl. xxiv.

Calotes emma, Gray, pl. xxv. fig. 1, and *liocephalus*, Gthr., pl. xxvi., figured; *id. t. c.* *C. liolepis*, sp. n., *id. t. c.* pl. xxv. fig. 2, Ceylon.

Chelosania brunnea, Gray, figured; *id. t. c.* pl. xxvii.

Agama latastii, p. 344, Egypt, *brachyura*, p. 350, pl. xxviii. fig. 1, Cape of Good Hope, *kirkii*, p. 354, pl. xxviii. fig. 2, E. Africa, spp. nn., *id. t. c.* *A. doriæ*, sp. n., *id.* Ann. Mus. Genov. (2) ii. p. 127, Keren, Abyssinia.

Amphibolurus cristatus, Gray, pl. xxix. fig. 1, *caudicinctus*, Gthr., pl. xxix. fig. 2, and *reticulatus*, Gray, pl. xxx. fig. 1, figured; *id. t. c.* The latter species described as *Macrops nuchalis*, g. & sp. nn.; De Vis, P. R. Soc. Queensl. i. [1884] p. 97 [*cf.* Boulenger, Ann. N. H. (5) xvi. p. 387]. *A. pulcherrimus*, fig. 2, and *pallidus*, fig. 3, spp. nn., Boulenger, Cat. Liz. i. p. 388, pl. xxx., W. Australia.

Tympanocryptis cephalus, Gthr., figured; *id. t. c.* pl. xxxi. fig. 1.

Diporophora australis, Steind., described as *D. nuchalis*, p. 98, and *ornata*, p. 99, spp. nn., and *D. bilineata*, Gray, as *D. brevicauda*, p. 99, and *pentalineata*, p. 99, spp. nn.; De Vis, *t. c.* [*cf.* Boulenger, Ann. N. H. (5) xvi. p. 387]. *D. bennetti*, Gray, figured by Boulenger, Cat. Liz. i. pl. xxxi fig. 2.

Physignathus longirostris, Blgr., fig. 3, and *temporalis*, Gthr., fig. 4,

figured; *id. t. c.* pl. xxxi. *P. lesueuri*, Gray, described as *palpebrosus* ... *guala-branchialis*, sp. n., De Vis, *t. c.* p. 55 [*cf.* Boulenger, Ann. N. H. (6) xvi. p. 387].

Aporoscelis, g. n., for *Uromastix princeps*, O'Sh., and *U. batilliferus*, Vaill.; Boulenger, *t. c.* p. 410.

Uromastix acanthinurus, Bell: habits in captivity; J. v. Fischer, Zool. Gart. xxvi. pp. 269–278, fig. *U. loricatus*, Blanf., figured by Boulenger, Cat. Liz. i. pl. xxxii.; described as *Centrotrachelus costatus*, by F. Müller, Verh. Ges. Basel, vii. p. 713, pl. x.

Iguanidæ.

Anolis gingivinus, Cope, pl. ii. fig. 1, *cybotes*, Cope, pl. i. fig. 5, *citrinellus*, Cope, pl. i. fig. 3, *lineatopus*, Gray, pl. i. figs. 1 & 2, *damulus*, Cope, pl. ii. fig. 2, *impetigosus*, Cope, pl. ii. fig. 3, *gemmosus*, O'Sh., pl. iii. fig. 2, *fraseri*, Gthr., pl. iv., *semilineatus*, Cope, pl. v. fig. 1, *bitectus*, Cope, pl. v. fig. 2, and *lentiginosus*, O'Sh., pl. vi. fig. 1, figured by Boulenger, Cat. Liz. ii. *A. tropidolepis*, p. 53, Costa Rica, *fasciatus*, p. 59, pl. iii. fig. 1, Ecuador, *salvini*, p. 75, Guatemala, *godmani*, p. 85, Central America, *leptoscelis*, p. 92, pl. v. fig. 3, Upper Amazons, spp. nn., *id. t. c.* *A. aureolus*, p. 390, Yucatan and Guatemala, *quaggulus*, p. 391, Nicaragua, and *uniformis*, p. 392, Guatemala, spp. nn., Cope, P. Am. Phil. Soc. xxii. *A. meridionalis*, sp. n., described as *A. chrysolepis*, D. & B.; Boettger, Z. Naturw. lviii. p. 215: subsequently regarded as new; *id. t. c.* p. 437, Paraguay.

Tropidodactylus, g. n., for *Norops onca*, O'Sh.; Boulenger, *t. c.* p. 97.

Enyalioides, g. n., for *Enyalius laticeps*, A. Dum., and allies; *id. t. c.* p. 112. *E. leechii*, sp. n., *id. t. c.* p. 473, Santarem, Upper Amazons.

Anisolepis, g. n., distinguished from *Enyalius* by the heterogeneous dorsal lepidosis; Boulenger, Ann. N. H. (5) xvi. p. 85. *A. iheringii*, sp. n., *id. t. c.* p. 86, and Cat. Liz. ii. pl. ix. fig. 3, Rio Grande do Sul [= *Enyalius undulatus*, Wgm.—Rec.].

Enyalius iheringii, sp. n., Boulenger, Ann. N. H. (5) xv. p. 192, and Cat. Liz. ii. pl. vii., Rio Grande do Sul. *E. bibronii*, sp. n. (= *E. rhombifer*, D. & B., *nec* Spix), *id.* Cat. Liz. ii. p. 119, Guianas, Brazil.

Stenocercus humeralis, Gthr., figured by Boulenger, *t. c.* pl. viii. fig. 2. *S. torquatus*, p. 133, pl. viii. fig. 1, Peru, *varius*, p. 134, pl. viii. fig. 3, hab.?, *cupreus*, p. 135, pl. ix. fig. 1, and *moestus*, p. 136, pl. ix. fig. 2, spp. nn., *id. t. c.*

Liolæmus gravenhorstii, Gray, figured by Boulenger, *t. c.* pl. x. fig. 1. *L. fuscus*, p. 144, pl. x. fig. 2, sp. n., *id. t. c.*, Chili. *L. occipitalis*, sp. n., *id.* Ann. N. H. (5) xv. p. 192, and Cat. Liz. ii. pl. x. fig. 3, Rio Grande do Sul.

Tropidocephalus azureus, Müll. Further notes by F. Müller, Verh. Ges. Basel, vii. p. 710.

Liocephalus aculeatus, O'Sh., pl. xi. and *ornatus*, Gray, pl. xii., figured by Boulenger, *t. c.* *L. guentheri*, sp. n., *id. t. c.* p. 169, pl. xiii., Ecuador.

Metopoceros and *Cyclura*. Cope, Am. Nat. xix. pp. 1005 & 1006, has a note on the large Iguanas of the Greater Antilles, describing two species as new which are regarded by the Recorder as identical with *Meto-*

...ads, viz., *Cyclura nigerrima*, from Navassa I., and *C. onchiopsis*, from an unknown locality, spp. nn.

Petrosaurus, g. n., for *Uta thalassina*, Cope; Boulenger, *t. c.* p. 205.

Uta gularis, sp. n., Cragin, Bull. Washb. Coll. i. [1884] p. 7, Guaymas, Mexico.

Sceloporus, Wiegm. A synopsis of the Mexican species, by Cope, P. Am. Phil. Soc. xxii. p. 393. *S. viviparus*, p. 398, Orizaba, *taniocnemis*, p. 399, Guatemala, *ferrariperezi*, p. 400, Guanajuato ?, and *melanogaster*, p. 400, Guanajuato ?, spp. nn., *id. t. c.*

Phrynosoma. A review of the (12) species of this genus, with synopsis, synonymy, and short descriptions; A. F. Gentry, P. Ac. Philad. 1885, pp. 138–148.

Zonuridæ.

Platysaurus guttatus, Smith, figured by Boulenger, Cat. Liz. ii. pl. xiv. fig. 1.

Anguidæ.

Gerrhonotus. The skin is cast off entire; Zipperlen, Zool. Gart. xxvi. p. 368. *G. cæruleus*, Wgm., pl. xxv. figs. A–D, and *morletii*, Bocourt, pl. xxiv. fig. C, figured by Günther, Biol. Centr. Am. *Rept. G. oaxacæ*, p. 36, pl. xxiv. fig. A, Oaxaca, and *obscurus*, p. 40, pl. xxv. fig. E, Mexico, spp. nn., *id. t. c.*

Barissia fimbriata, n. n. for *Gerrhonotus auritus*, Bocourt, *nec* Cope; Cope, P. Am. Phil. Soc. xxii. p. 171.

Ophisaurus gracilis, Gray, pl. xv. fig. 1, and *koellikeri*, Gthr., fig. 2, figured by Boulenger, Cat. Liz. ii.

Propseudopus fraasii, Hilg. (foss.). Exhaustive description by Hilgendorf, Z. geol. Ges. xxxvii. pp. 358–378, pls. xv. & xvi. This author has the merit of first discovering vomerine teeth in Reptiles (*Pseudopus* and *Propseudopus*).

Diploglossus steindachneri, Cope, pl. xxii. fig. A, and *monotropis*, Kuhl, pl. xxiii., figured by Günther, *t. c.* *D. striatus*, Gray, pl. xvi., and *hewardii*, Gray, pl. xvii., figured by Boulenger, *t. c.*

Sauresia sepoides, Gray, figured; *id. t. c.* pl. xiv. fig. 2.

Helodermatidæ.

Heloderma horridum, Wgm. A young specimen figured by Günther, Biol. Centr. Am. *Rept.* pl. xxvi.

Anniellidæ.

Anniella nigra, sp. n., J. G. Fischer, Abh. Ver. Hamb. ix. p. —, San Diego, California. [Recorded from a separate copy.]

Varanidæ.

Varanus grayi, n. n. for *V. ornatus*, Gray, *nec* Daud.; Boulenger, Cat. Liz. ii. p. 312. *V. acanthurus*, n. n. for *Odatria ocellata*, Gray, *nec*

Rüpp. ; *id. t. c.* p. 324. *V. caudolineatus*, sp. n., *id. t. c.* p. 32[illegible] *palpebrosa* ~ *anala*- Champion Bay, N.W. Australia.

Teiidæ.

Ameiva surinamensis, Laur. A variety figured by Günther, Biol. Centr. Am. *Rept.* pl. xix.

Cnemidophorus guttatus, Wgm., figured by Günther, *t. c.* pl. xxi. *C. mariarum*, sp. n., *id. t. c.* p. 28, pl. xx., Tres Marias Is., Mexico. *C. espeuti*, sp. n., Boulenger, Cat. Liz. ii. p. 362, pl. xix., Old Providence I., Colombia.

Alopoglossus, g. n., distinguished from *Leposoma*, Spix, by the absence of imbricate scale-like papillæ on the tongue, these being replaced by oblique plicæ converging towards the median line. *A. copii*, sp. n. (= *Leposoma carinicaudatum*, O'Sh., *nec* Cope), Boulenger, *t. c.* p. 383, pl. xx. fig. 1, Ecuador.

Arthrosaura, g. n., forming a connecting link between *Prionodactylus*, O'Sh., and *Heterodactylus*, Wagl. ; Boulenger, *t. c.* p. 389 (for *Cercosaura reticulata*, O'Sh.).

Prionodactylus oshaughnessyi, sp. n., *id. t. c.* p. 392, pl. xxi. fig. 1 (= *P. argulus*, O'Sh., *nec* Peters), Ecuador. *P. vertebralis*, O'Sh., figured ; *id. t. c.* pl. xxi. fig. 2.

Oreosaurus oculatus, O'Sh., figured ; *id. t. c.* pl. xx. fig. 2.

Proctoporus simoterus, O'Sh., figured ; *id. t. c.* pl. xxii. fig. 1. *P. meleagris*, sp. n., *id. t. c.* p. 415, pl. xxii. fig. 2, Ecuador.

Scolecosaurus, n. n. for *Brachypus*, Fitz., *nec* Swains. ; Boulenger, *t. c.* p. 416.

Heterodactylus imbricatus, Spix. Remarks by Boulenger, P. Z. S. 1885, p. 63.

Micrablepharus, g. n., distinguished from *Gymnophthalmus* by the absence of præfrontals and the presence of frontoparietals ; Bœttger, Z. Naturw. lviii. p. 217. *M. glaucurus*, sp. n., *id. t. c.* p. 218, Paraguay (= *Gymnophthalmus maximiliani*, R. & L. ; *id. t. c.* p. 436).

Amphisbænidæ.

Smalian, C. Beiträge zur Anatomie der Amphisbæniden. Z. wiss. Zool. xlii. pp. 126–202, pls. v. & vi.

Researches on the anatomy (chiefly myology) of *Blanus cinereus*, *Amphisbæna fuliginosa*, *Anops kingii*, and *Trogonophis wiegmanni*.

Amphisbæna leonina, sp. n., F. Müller, Verh. Ges. Basel, vii. p. 700, pl. ix. figs. *a–c*, Tumbo I. *A. beniensis*, sp. n., Cope, P. Am. Phil. Soc. xxii. p. 184, Upper Beni River, Bolivia. *A. trachura*, p. 187, and *Aporarchus* (g. n.) *prunicolor*, p. 189, spp. nn., Cope, *t. c.*, Rio Grande do Sul [= *A. darwini*, D. & B. ; Boulenger, Ann. N. H. (5) xvi. p. 296]. *A. albocingulata*, sp. n., Bœttger, Z. Naturw. lviii. p. 219, Paraguay.

Anops kingii, Bell. On its egg : Boulenger, Ann. N. H. (5) xv. p. 193 ; Smalian, *t. c.* p. 130, pl. vi. fig. 27.

nentheri, sp. n., Boulenger, Cat. Liz. ii. p. 456, pl. xxiv. fig. 3, Congo.

Lepidosternon polystegum, A. Dum. : note on a specimen escaping from the body of an *Elaps lemniscatus* ; Boulenger, P. Z. S. 1885, p. 327. *L. boulengeri*, p. 220, *strauchi*, p. 221, *affine*, p. 223, and *onychocephalum*, p. 224, spp. nn., Bœttger, *t. c.*, Paraguay. *L. boettgeri*, sp. n., Boulenger, Cat. Liz. ii. p. 466, pl. xxiv. fig. 5, Argentine Republic.

Lacertidæ.

A synopsis of the (16) genera of the family *Lacertidæ* ; F. Lataste, Ann. Mus. Genov. (2) ii. p. 124.

Tachydromus wolteri, sp. n., J. G. Fischer, JB. Hamb. ii. p. 82, Corea [= *T. trachydromoides*, Schleg.—Rec.].

Lacerta echinata, Cope, figured by Vaillant as *L. hirticauda*, Vaill. ; Bull. Soc. Z. Fr. ix. pl. xii. fig. 1. *L. viridis*, Laur. : notes on habits, geographical distribution, and specific characters; Bœttger, Zool. Gart. xxvi. pp. 140–147. *L. schreiberi*, Bedr. ; Seoane, Identidad de Lacerta Schreiberi y L. viridis var. Gadovii (tract, 1885). *L. ocellata* var. n. *iberica*, p. 8, and *L. muralis*, var. n. *bocagii*, p. 18 ; *id. t. c.*, Galicia, Spain. *L. muralis* var. n. *pityusensis*, Boscá, An. Soc. Esp. xii. p. 246 [1883], Ibiza. *L. oxycephala*, D. & B., subsp. n. *bedriagæ*, Camerano, Zool. Anz. viii. p. 418, Corsica.

Acanthodactylus. Lataste, Ann. Mus. Genov. (2) ii. pp. 476–516, publishes a revision of the species of this genus, dealing more specially with those of Barbary. *A. vaillanti*, sp. n., *id. t. c.* p. 509, Somali-land [= *Lacerta savignyi*, Aud.—Rec.].

Boulengeria, g. n., Lataste, *t. c.* p. 116, for *Eremias mucronatus*, Blanf., and *E. brenneri*, Ptrs. [= *Pseuderemias*, Bœttger, Abh. senck. Ges. xiii. 1883, p. 118, footnote].

Holaspis guentheri, Gray, occurs in Sierra Leone and the Gold Coast; F. Müller, Verh. Ges. Basel, vii. p. 702.

Scincidæ.

Trachysaurus is really viviparous, not ovoviviparous, the number of young varying from one to three ; *Cyclodus* is likewise viviparous : W. Haacke, Zool. Anz. viii. pp. 435–439. *T. rugosus*, Gray, figured by McCoy, Prodr. Zool. Vict., Dec. xi. pl. cii.

Silybosaurus zellingi, sp. n , De Vis, P. R. Soc. Queensl. i. p. 53 [1884], Barcoo, Australia.

Hinulia picta, sp. n., Macleay, P. Linn. Soc. N. S. W. x. p. 65, Herbert River District, Queensland [= *Hemisphæriodon gerrardi*, Gray.—Rec.].

Tetradactylus guttulatus, sp. n., Macleay, *t. c.* p. 66, Herbert River District.

Heteropus. A synopsis of the species by De Vis, P. R. Soc. Queensl. i. pp. 166–173. The following are described as new :—*H. lateralis*, p. 168, Moreton Bay, *blackmanni*, p. 168, Port Curtis, *pectoralis*, p. 169, Port Curtis, *maculatus*, p. 169, Cape York, *rubricatus*, p. 170, Cape York,

palpebrosa rostralis, p. 171, Cardwell, and *mundus* [= *Carlia melanopogon quala*-Rec.], p. 172, Port Curtis.

Myophila, g. n. "Scales keeled; toes $\frac{4}{5}$; ears exposed; head conical; supranasals none; nasals small, oval; eyelid rudimentary; enlarged preanals four." *M. virax*, sp. n., *id. t. c.* p. 77, Queensland.

Lygisaurus, g. n. "Scales smooth, keelless; toes $\frac{4}{5}$; ears exposed; head conical; rostral broad; supranasals none; nasal sublenticular; prefrontal single; postfrontals widely separated." *L. foliorum*, sp. n., *id. t. c.*, Queensland.

Mabuia tetratænia, sp. n., Bœttger, Z. Naturw. lviii. p. 227, Paraguay [= *M. dorsivittata*, Cope.—Rec.].

Euprepes pantænii, p. 88, pl. iii. fig. 3, W. Africa [= *E. raddoni*, Gray.—Rec.], and *warthii*, p. 90, N.W. India [= *E. dissimilis*, Hallow.—Rec.], spp. nn., J. G. Fischer, JB. Hamb. ii. *Euprepes* sp. and *E. aureogularis*, sp. n.?, F. Müller, Verh. Ges. Basel, vii. pp. 706 & 707, Gold Coast. *E. chaperi*, Vaill. [= *Riopa sundevallii*, Smith.—Rec.], figured by Vaillant, Bull. Soc. Z. Fr. ix. pl. xii. fig. 2.

Cophoscincus simulans, Vaill. [= ? *Tiliqua dura*, Cope.—Rec.], figured; *id. t. c.* fig. 3.

Tiliqua nigripes, sp. n.?, F. Müller, Verh. Ges. Basel, vii. p. 704, Gold Coast [= *T. fernandi*, Burt.—Rec.].

Eumeces (*Riopa*) *gracilis*, p. 85, pl. iii. fig. 1, and *schadenbergi*, p. 87, fig. 2, spp. nn., J. G. Fischer, JB. Hamb. ii., Mindanao [belong to the genus *Senira*, Gray.—Rec.]. *E. brevirostris*, Gthr., pl. xxii. fig. B, and *bocourti*, Blgr., fig. C, figured by Günther, Biol. Centr. Am. *Rept. E. dugesii*, Thomin., described and figured by A. Dugès, Nat. Mex. vi. [1884] p. 361, pl. ix. fig. 2 [= *E. brevirostris*, Gthr.—Rec.]. *E. furcirostris*, sp. n., Cope, P. Am. Phil. Soc. xxii. p. 169, Jalapa [= *E. lynxe*, Wgm.—Rec.].

Anelytropidæ.

Anelytropsis, g. n. Allied to *Feylinia*, Gray; Cope, P. Am. Phil. Soc. xxii. p. 380. *A. papillosus*, sp. n., *id. t. c.* pl. —, fig. 9, Jalapa, Mexico.

Chamæleontidæ.

D'Arcy W. Thompson, Nature, xxxii. p. 562, believes that the great anatomical differences which separate the Chamæleon from all [illegible] *Lacertilia* are connected with marked resemblances to the *Dinoincreus*, especially the group *Sauropoda*.

Chamæleon simoni, sp. n., Bœttger, Ber. offenb. Ver. xxiv. & xxv. p. 700, Gold Coast. *Chamæleon* sp. from S. Algeria described by F. Müller, Verh. Ges. Basel, vii. p. 715, pl. xi.

Mosasauridæ.

Osteological notes by L. Dollo, Bull. Mus. Belg. iv. pp. 32–35.

Hainosaurus, g. n., for *H. bernardi*, sp. n., Dollo, *t. c.* p. 25, Chalk of

[illegible], near Mons, Belgium. On the discovery of *Hainosaurus*; [illegible] Dupont, Bull. Ac. Belg. (3) ix. p. 215.

Further notes on the osteology of the *Mosasauridæ* (presence of a median basioccipital canal, and of an interclavicle in *Plioplatecarpus marshi*, Dollo, etc.); Dollo, Ann. Soc. Brux. ix. pp. 319–335, figs.

OPHIDIA.

Palacký, J. Die Verbreitung der fossilen Schlangen in Europa. SB. böhm. Ges. 1884, pp. 165 & 166.

Considerations derived from the results of Rochebrune's works.

O. E. Eiffe has notes on the habits of Snakes in captivity; Zool. Gart. xxvi. pp. 43–51.

De Vis, C. W. On Deglutition in the Fresh-water Snake. P. R. Soc. Queensl. i. p. 82.

Typhlopidæ.

Typhlops nigrescens, Gray, figured by McCoy, Prodr. Zool. Vict., Dec. xi. pl. ciii. *T. prælongus*, sp. n. ?, F. Müller, Verh. Ges. Basel, vii. p. 674, Cordova, Mexico.

Odontomophis atavus, g. & sp. nn. (foss.), Rochebrune, Mém. Soc. Soane, v. [1884] p. 151, pl. ii. fig. 1, Phosphorites du Quercy.

Omoiotyphlops priscus, g. & sp. nn. (foss.), *id. t. c.* p. 152, pl. ii. fig. 2.

Tortricidæ.

Plesiotortrix edwardsi, g. & sp. nn. (foss.), Rochebrune, Mém. Soc. Soane, v. [1884] p. 156, pl. ii. fig. 6, Phosphorites du Quercy.

Boidæ.

Tropidophis morcletii, sp. n., Bocourt, Bull. Soc. Philom. (7) ix. p. 113, Vera Paz, Guatemala.

Nardoa crassa, sp. n., Macleay, P. Linn. Soc. N.S.W. x. p. 66, Herbert River District, Queensland.

Liasis sp. (near *maculosus*, Ptrs.) described by F. Müller, Verh. Ges. Basel, vii. p. 677.

McCoy *on breitensteini*, Steind. The young described and figured by Silv[illegible]er, Arch. f. Nat. li. p. 68, pl. v. fig. 5.

Bar[illegible]*estophis*, n. n. for ‖ *Limnophis*, Marsh; Marsh, Am. J. Sci. (3) xxix. 169.

Palæopython neglectus, sp. n. (foss.), Rochebrune, Mém. Soc. Soane, v. [1884] p. 154, pls. i. fig. 1, & ii. fig. 5, Phosphorites du Quercy.

Colubridæ.

Calamaria grabowskyi, sp. n., Fischer, Arch. Nat. li. p. 50, pl. iv. fig. 1, S.E. Borneo.

Elapomorphus, D. & B. A review of the species, by [illegible] *palpebrosa* biol. xii. pp. 141–211, and Bull. Pétersb. xxix. pp. 541–590. *E. iheringii*, sp. n., Strauch, *tt. cc.*, Rio Grande do Sul: = *Phalotris melanopleurus*, sp. n., Cope, P. Am. Phil. Soc. xxii. p. 189, Rio Grande do Sul, = *E. lemniscatus*, D. & B.; Boulenger, Ann. N. H. (5) xv. p. 321, pl. x., & xvi. p. 296.

Geophis dugesii, Bocourt, described and figured by A. Dugès, Nat. Mex. vi. [1884] p. 359, pl. ix. fig. 1. *G. reticulatus*, sp. n., Boulenger, Ann. N. H. (5) xvi. p. 87, Rio Grande do Sul. *G. schadenbergi*, sp. n., Fischer, JB. Hamb. ii. p. 93, pl. iii. fig. 4, Mindanao.

Rhabdosoma mutitorques, sp. n., Cope, P. Am. Phil. Soc. xxii. p. 384, Zacualtipan, Mexico.

Homalocranium trivittatum, sp. n.?, F. Müller, Verh. Ges. Basel, vii. p. 678, Guatemala.

Gyalopium, g. n., for *Ficimia publia*, Cope [= *F. ornata*, Bocourt]; Cope, *t. c.* p. 177.

Contia michoacanensis, sp. n., *id. t. c.* p. 178, Michoacan, Mexico.

Virginia fasciata, sp. n., Fischer, JB. Hamb. ii. p. 95, Guatemala.

Simotes affinis, sp. n., *id.* Abh. Ver. Hamb. ix. p. —, pl. i. fig. 1, Nias [recorded from a separate copy] = *S. labuanensis*, Gthr.; Boulenger, Ann. N. H. (5) xvi. p. 388.

Rhinaspis rohdei, sp. n., Bœttger, Z. Naturw. lviii. p. 231, Paraguay.

Lystrophis, g. n., for *Heterodon dorbignyi*, D. & B.; Cope, *t. c.* p. 193.

Ablabes baliodirus, Schleg., var. n. *cinctus*, Fischer, Abh. Ver. Hamb. ix. p. —, pl. i. fig. 2, Nias [recorded from a separate copy].

Trimetopon, g. n., for *Ablabes gracilis*, Gthr.; Cope, *t. c.* p. 177.

Enicognathus bilineatus, sp. n., Fischer, JB. Hamb. ii. p. 98, pl. iii. fig. 5, Santos.

Diadophis rubescens, sp. n., Cope, *t. c.* p. 403, New Providence I., Bahamas.

Coronella iheringii, sp. n., Boulenger, Ann. N. H. (5) xv. p. 194, Rio Grande do Sul. *C.* (*Meizodon*?) sp. from Cameroon described by F. Müller, *t. c.* p. 679.

Opheomorphus fuscus, sp. n., Cope, *t. c.* p. 190, Rio Grande do Sul. Remarks by Boulenger, Ann. N. H. (5) xvi. p. 297.

Liophis (*Lygophis*) *genimaculata*, sp. n., Bœttger, Z. Naturw. lviii. p. 229, Paraguay.

Aporophis cyanopleurus, sp. n., Cope, *t. c.* p. 191, Rio Grande do [illegible] = *Dromicus melanostigma*, Wagl.; Boulenger, *t. c.* p. 297.

Dromicus cæruleus, sp. n., Fischer, JB. Hamb. ii. p. 103, pl. iv. fig. [illegible] *cereus*, Guatemala.

Rhegnops sargii, sp. n., *id. t. c.* p. 92, Guatemala.

Bothrophthalmus brunneus, Gthr. Note by F. Müller, *t. c.* p. 680.

Coluber porphyraceus, Cant., from Sumatra, figured by Hubrecht, Midden-Sumatra, *Rept.* pl. —, fig. 1. *C. mutabilis*, sp. n., Cope, *t. c.* p. 175, Vera Paz.

Compsosoma melanurum var. *erythrurum*, S. Müll. Remarks on specimens from Mindanao: Fischer, JB. Hamb. ii. p. 101.

...owskyi, sp. n., Fischer, Arch. f. Nat. li. p. 59, pl. iv. fig. 3, S.E. Borneo.

Palælaphis, g. n. (foss.), near *Elaphis*, for *P. antiquus*, p. 156, pls. i. fig. 3, & ii. fig. 7, and *P. robustus*, p. 157, pl. ii. fig. 8, spp. nn.; Rochebrune, Mém. Soc. Soane, v. [1884], Phosphorites du Quercy.

Tachyophis, g. n. (foss.), near *Zamenis*, for *T. nitidus*, sp. n.; *id. t. c.* p. 159, pls. i. fig. 5, & ii. fig. 10, same beds.

Pylmophis gracilis, sp. n. (foss.), *id. t. c.* p. 158, pls. i. fig. 4, & ii. fig. 9, same beds.

Zamenis diadema, Schleg., var. n. *atriceps*, Fischer, JB. Hamb. ii. p. 102, Himalaya.

Scaphiophis albopunctatus, Ptrs. Remarks on Nubian specimens; *id. t. c.* p. 100, pl. iii. fig. 6.

Grayia silurophaga, Gthr. Note by F. Müller, *t. c.* p. 683.

Tropidonotus natrix, var. n. *astreptophorus*, Seoane, Identidad de Lacerta Schreiberi, &c., p. 15, Galicia, Spain. *T. trianguligerus*, Reinw., var. n. *annularis*, Fischer, Arch. f. Nat. li. p. 55, S.E. Borneo. *T. chrysargos*, Boie: the young described and figured; *id. t. c.* p. 57, pl. iv. fig. 2. *T. atri*, sp. n., Macleay, P. Linn. Soc. N. S. W. x. p. 67, Herbert River District, Queensland.

Eutænia insigniarum, pp. 172 & 386, *chrysocephala*, p. 173, and *pulchrilatus*, p. 174, spp. nn., Cope, P. Am. Phil. Soc. xxii., Mexico. Additional notes on *E. sumichrasti*, Cope; *id. t. c.* p. 174. *E. rutiloris*, sp. n., *id. t. c.* p. 388, Cozumel I.

Storeria tropica, sp. n., *id. t. c.* p. 175, Peten, Guatemala.

Helicops baliogaster, sp. n., *id. t. c.* p. 193, Rio Grande do Sul: = *H. infrataeniatus*, Jan., = *H. carinicaudus*, Wied.; Boulenger, Ann. N. H. (5) xvi. p. 297.

Hydrocalamus, g. n., for *Homalopsis quinquevittatus*, D. & B. [= *Hydrops lubricus*, Cope]; Cope, *t. c.* p. 176.

Heleophis flavescens, Müll., = *Campylodon prevostianum*, Eyd. & Gerv.; F. Müller, *t. c.* p. 700.

Manolepis, g. n., for *Tomodon nasutus*, Cope; Cope, *t. c.* p. 176.

Cyclagras, g. n., for *Xenodon gigas*, D. & B., and *Liophis bicinctus*, D. & B.; *id. t. c.* p. 185.

Tropidodryas, g. n., for *Philodryas æstivus* and *P. serra*; *id. t. c.* p. 192.

Tragops fasciolatus, sp. n., Fischer, Arch. f. Nat. li. p. 66, pl. v. fig. 4, S.E. Borneo.

Eumesodon carinatus, Cope (?). Note by F. Müller, *t. c.* p. 685.

Psammodynastes. Remarks on the inconstancy of the distinctive char- ... of *P. pictus*, *pulverulentus*, and *conjunctus*; Fischer, *t. c.* p. 62.

Dipsas (*Trimorphodon*) *biscutata*, D. & B., is poisonous; note on its poison-gland: A. Dugès, Nat. Mex. vi. [1882], pp. 145–148, figs. *D. regalis*, Schleg.: note by F. Müller, *t. c.* p. 687. *D.* sp. from Tumbo I.; *id. t. c.* p. 688.

Thamnodynastes nattereri, Mik., var. n. *lævis*, Boulenger, Ann. N. H. (5) xv. p. 195, Rio Grande do Sul.

Leptognathus alternans, p. 105, pl. iv. fig. 8, Santos, and *albocinctus*,

p. 107, pl. iv. fig. 9, California, spp. nn., Fischer, JB. [illegible] *palpebrosa* [illegible] *ventrimaculatus*, sp. n., Boulenger, Ann. N. H. (5) xvi. p. 87, Rio Grande do Sul. *L.* (*Dipsadomorus*) *cisticeps*, sp. n., Boettger, Z. Naturw. lviii. p. 237, Paraguay.

Pareas moellendorffi, sp. n., *id.* Ber. offenb. Ver. xxiv. & xxv., p. 125, Canton and Siam.

Elapidæ.

Furina ramsayi, sp. n., Macleay, P. Linn. Soc. N. S. W. x. p. 61, Milparinka, Barrier Ranges.

Cacophis warro, sp. n., De Vis, P. R. Soc. Queensl. i. p. 139 [1884], Port Curtis.

Brachysoma sutherlandi, sp. n., *id. t. c.* p. 139, Norman River.

Hoplocephalus. A key to the species by De Vis, *t. c.* p. 140. *H. ornatus*, sp. n., *id. t. c.* p. 100, pl. xv., near Surat. *H. sulcans*, p. 138, Mitchell District, and *vestigiatus*, p. 138, loc. ?, spp. nn., *id. t. c.* *H. assimilis*, sp. n., Macleay, P. Linn. Soc. N. S. W. x. p. 68, Herbert River District, Queensland. *H. muelleri*, sp. n., Fischer, JB. Hamb. ii. p. 109, Queensland.

Rhinocephalus bicolor, g. & sp. nn. ?, F. Müller, Verh. Ges. Basel, vii. p. 690, pl. ix. figs. 1–1, Australia.

Pseudonaja nuchalis. Note on an anomalous specimen; De Vis, *t. c.* p. 58.

Naja haje, L., var. n. *leucosticta*, Fischer, *t. c.* p. 115, pl. iv. fig. 11, W. Africa.

Dinophis fasciolatus, sp. n., *id. t. c.* p. 111, pl. iv. fig. 10, W. Africa.

Elaps corallinus, L. On its Mexican varieties; A. Dugès, Nat. Mex. vii. pp. 200–203.

Hydrophiidæ.

Hydrophis sp. from Tasmania (?) noticed by F. Müller, Verh. Ges. Basel, vii. p. 692.

Viperidæ.

Vipera berus: remarks on the common Viper, and on its subspecies *V. seoanei*, Lat.; Boulenger, Zool. xliii. pp. 373–375. Further notes on *V. aspis* and *berus* in Switzerland; F. Müller, Verh. Ges. Basel, vii. pp. 692–695.

Atheris lucani, p. 89, Landana, and *proximus*, p. 90, Bissarié, Casamance, spp. nn., Rochebrune, Bull. Soc. Philom. (7) ix. *A. chlorocchis*, aut. sp. affin., described by F. Müller, *t. c.* p. 696.

Crotalus triseriatus, Jan, = *C. ximenesii*, Dugès, = *C. polystictus*, Cope; *C. lugubris*, Jan, = *C. triseriatus*, Wagl.: Cope, P. Am. Phil. Soc. xxii. p. 179.

Trigonocephalus blomhoffii, Schleg. On its habits; Eastlake, Nature, xxxi. p. 587.

... *nasus*, Garman, 1881, = *Bothrops ammodytoides*, ...eybold, Escursion á las Pampas Argentinas, Santiago de Chile, 1873, p. 80; C. Berg, An. Soc. Arg. (5) xix. p. 236. *Bothrops patagonicus*, sp. n.?, F. Müller, *t. c.* p. 697, Bahia Blanca [= *B. ammodytoides*.—Rec.].

Trimeresurus schadenbergi, sp. n., Fischer, JB. Hamb. ii. p. 116, Mindanao.

BATRACHIA.

E. D. Cope, Geol. Mag. (3) ii. p. 575, opposes the use of the term *Amphibia* for this class. "Although [it] is the better name, it has not the claim of priority by a half century at least. Although the early definitions were imperfect, the contents of the class were then the same as now. The division *Batrachia*, used by Lamarck and Cuvier, is uniformly employed in the herpetological literature of the last half century, except by a few German authors, who combined the *Reptilia* in one division under the name *Amphibia*. Not only has the name *Amphibia* no claim on the ground of priority, but the diverse uses to which it has been put also render its use undesirable."

Cope, E. D. On the Evolution of the *Vertebrata*, Progressive and Retrogressive. v. The Line of the *Batrachia*. Am. Nat. xix. pp. 243–245.

7 Orders are recognized, viz., *Rachitomi*, *Embolomeri*, *Stegocephali*, *Proteida*, *Urodela* (including probably the *Gymnophiona* or *Apoda*), *Trachystomata*, and *Anura*.

Kölliker, A. Histologische Studien an Batrachierlarven. Z. wiss. Zool. xliii. pp. 1–40, pls. i. & ii.

List, J. H. Ueber einzellige Drüsen (Becherzellen) im Blasenepithel der Amphibien. Zool. Anz. viii. pp. 556–559.

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ECAUDATA.

BLANCHARD, R. Remarques sur la Classification des Batraciens Anoures. Bull. Soc. Z. Fr. x. pp. 584–589.

On the importance of the mode of articulation of the vertebral centra as primordial characters for the classification of the *Batrachia*.

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MARSHALL, A. M. The Frog: an Introduction to Anatomy and Histology. 2nd edition, revised and illustrated. London & Manchester: 1885, 8vo, 101 pp., figs.

BORN, G. Ueber den Einfluss der Schwere auf das Froschei. Arch. mikr. Anat. xxiv. pp. 475–545, pls. xxiii. & xxiv.

HÉRON-ROYER, —. Cas tératologiques observés chez quelques têtards de Batraciens anoures, et de la possibilité de prolonger méthodiquement l'état larvaire chez les Batraciens. Bull. Soc. Z. Fr. ix. [1884] pp. 162–167, fig.

——. Note sur les amours, la ponte et le développement du Discoglosse (*Discoglossus pictus*, Otth), suivie de quelques remarques sur la classification des Anoures. *Op. cit.* x. pp. 565–583, pl. xiv.

Notes on the embryology of the European tailless Batrachians, and on its bearing on the classification. The *Discoglossidæ* are proposed to be split into 3 families: *Discoglossidæ*, *Bombinatoridæ*, and *Alytidæ*.

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[Owing to the kindness of Prof. Vaillant, the Recorder was ... mine the specimen alluded to. The precoracoids and the greater part of the sternum have been cut away in the course of the dissection. The parts figured as the arched epicoracoids are nothing but the cartilaginous proximal ends of the coracoids, the specimen being a young one.]

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Hylidæ.

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A preliminary note on the authors' discovery of the oviposition and development of *Ichthyophis glutinosus*. The eggs are deposited, shortly after impregnation, in a hole in damp earth; they form a small mass, which the mother protects by coiling herself round it. The embryo develops large external gills within the egg. As regards the systematic position of the Apodal Batrachians, the authors think this group should rank with or quite near the *Caudata*. They represent as embryos the Perennibranchiates, as larvæ the Derotremes, and as perfect land-animals the Salamandroids.

STEGOCEPHALA.

p. 11

A short review of our knowledge of the *Labyrinthodonta*; L. Dollo, Rev. Quest. Sci. xvii. pp. 305–312.

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The following new genera and species are established :—*Dendrerpeton pulpebrosa*

Dendrerpeton pyriticum, sp. n., p. 6.

Sparagmites lacertinus, sp. n., p. 15.

Loxomma bohemicum, sp. n., p. 16.

Cochleosaurus, g. n., p. 30, for *Melosaurus*? *bohemicus*, Fritsch, and *C. fallax*, sp. n., p. 31.

Gaudrya, g. n., p. 31, for *G. latistoma*, sp. n., p. 31.

Nyrania, g. n., p. 33, for *N. trachystoma*, sp. n., p. 33.

Macromerion? *abbreviatum*, p. 40, *bicolor*, p. 41, *simplex*, p. 41, *juvenile*, p. 41, and *pauperum*, p. 41, spp. nn.

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On *Melanerpeton pulcherrimum*, Fritsch, *Pelosaurus laticeps*, Credn., *Hylonomus fritschii*, Gein. & Deichm.

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Descriptions of a new genus and 3 new species of *Stegocephalia* :—

Ceraterpeton divaricatum, sp. n., p. 406.

Anisodexis enchodus, sp. n., p. 406.

Cercariomorphus, g. n., of quite uncertain position, for *C. parvisquamis*, sp. n., p. 405.

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Scapherpeton. Cope, *t. c.* p. 407, thinks it not unlikely that the bodies formerly described by him as *Arotus hieroglyphicus* are the copulatory claspers of this Batrachian.

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W. R. Ogilvie-Grant.

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——. (B) Sur les caractères du *Cybium sara*, Bennet. *T. c.* pp. 21–23.

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WARD, M. F. [See PITTIER.]

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——. (B) On the Hyomandibular Clefts and Pseudobranchs of *Lepidosteus* and *Amia*. J. Anat. Phys. xix. pp. 477–497, pl. xxiv.

——. (C) On the Function of the Serrated Appendages of the Throat in *Amia*. Science, iv. p. 511.

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II.—GENERAL, PHYSIOLOGICAL, ANATOMICAL, and EMBRYOLOGICAL.

KINGSLEY. The Standard Natural History is perhaps the best work of its kind that has yet been published. The United Work of KINGSLEY (the Editor), J. Micr. Soc. v. 62–362, the united are excellent both as regards text, which contains nt of the Salmon. *T. c.* and plates, which are chiefly original and very v. p. 786.

[illegible] On distribution of colour in the animal kingdom, with special reference to fish, p. 349.

Dunn, Cornish (A & B), & Pearcey. On the food of Fish.

Halpérine. On Piscivorous Plants.

McIntosh. (A) On the eggs of Fish.

Agassiz & Whitman. (A) On the development of Pelagic Fish eggs.

Ryder. (A) An outline of a theory of the development of the unpaired fins of Fishes.

——. (D) On the position of the yolk-blastopore as determined by the size of the vitellus.

Solger. Yolk globules in the intracapsular fluid of Fish ova.

Pilliet. On the structure of the alimentary canal in certain marine Fish.

Phisalix. On the anatomy and physiology of the spleen in *Ichthyopsida*.

Morris. Notes on the functions and organic relations of the air-bladder in Fish.

Grosglik. On the morphology of the head-kidney. [See Emery.]

Beard. (A) On the cranial ganglia and segmental sense-organs of Fish.

——. (B) The system of branchial sense-organs, and their associated ganglia in *Ichthyopsida*.

Krause. The retina of Fish.

Apgar. Binocular vision of lateral-eyed Fish.

Lendenfeld. On the eyes of deep-sea Fishes.

Sèdi. Remarks on M. de Sèdi's experiments on the lateral line in Fishes, proving it to be a very delicate organ of touch adapted to the requirements of an aquatic life.

Niemiec. On the suckers of animals (*Echeneis remora* and *Lepidogaster gonanii*).

Mills. The action of certain drugs and poisons on the cardiac nerves of Fish.

Canestrini. On some monstrosities among Fish.

Day. (C) The effects of an elevated temperature on Fishes.

III.—FAUNÆ.

Europe.

Finland. Sundman has published parts v. & vi. of his Fish.

Norway and *Sweden*. Liljeborg gives extensive descriptions, &c., of *Acanthopterygii*. Ljungman writes on the Herring Fisheries of the west [illegible]st.

[illegible]ria[illegible]*tic*. Nettelbladt: note on the Fish fauna.

[illegible]*Russia*. Warpachowsky: Fish of the Sura river.

Scotland. Information about the Fish and Fisheries, in Rep. Fish. Scotl. iii.

Aberdeen. Day (G) gives notes on rare Fishes off the coast. Sim records the occurrence of *Alopias vulpes*, *Rhina squatina*, *Sebastes norvegicus*, *Carelophus ascanii*, and *Coris julis*.

St. Andrew's. McIntosh (A, B, & C): notes on Fish from the laboratory. Remark on the spawning of certain marine Fish (*Cottus*, *Agonus*, *Zoarces*, *Annarhichas*, and *Clupea*).

Germany. Wiedemann gives a list of 47 known species of Fish from Swabia and Neuburg.

Switzerland. Fatio, on the *Coregonus* found in the lakes. Forel publishes a list, with a few notes on the known species of Fish from the lakes. Pittier & Ward record 4 well-known species of Fish from Vaud.

Gulf of Genoa. Vinciguerra, on some hitherto unrecorded species.

Messina. Cocco continues his catalogue of the Fish, with notes. Facciolà (A), on the Blennies; (B), on certain rare *Pleuronectidæ*.

Asia.

Lake Balkhash. Nikolski: notes on the Fish.

Day (B): various remarks, corrections, and additions to Günther's Fresh-water Fishes of the Indian and African faunas.

Irrawaddy. Vinciguerra: remarks on 29 known species.

Wiedemann, Steindachner & Döderlein have published part iii. of their Report on the Fishes.

Cochin China. Tirant.

Africa.

Africa. See Day (B), *India*, and Fischer, new species from Africa in the Hamburg Museum.

America.

N. America. For information concerning the Fish and Fisheries, see Bull. U. S. Fish Comm. v. and Rep. U. S. Fish Comm. 1882 & 1883 (1885).

——. Goode & Bean (A) and Jordan (I): on the American Fishes in the Linnæan Collection.

——. Jordan: (A) supplementary notes and (K) supplement to Jordan & Gilbert's Synopsis, with numerous additions and corrections of errors in nomenclature of known species.

——. Eigenman & Fordice (B) review the American *Eleotridinæ* (*Eleotris* of Günther's Catalogue).

——. Garman (C): *Salmonidæ*, including introduced species.

——. Hall & McCaughan review the American *Mullidæ*.

——. Jordan & Meek (B) review the Flying Fish of American waters.

——. Meek & Hall review the American genera and species of *Batrachidæ*.

——. Meek & Newland (A & B) give reviews of the American species of *Esox* and *Scorpæna*.

Point Barrow, Alaska. Murdoch publishes a list, with notes on 18 species of Fish obtained by the International Polar Expedition. The new species have been already recorded by Bean.

Lake Superior. Jordan (J): notes on the Fish.

Nova Scotia. Honeyman makes additions to the Jones Catalogue.

[illegible], *Mass.* Bean (J) gives a list of Fish collected by the [illegible] Fish Comm.

Long Island Sound. Bean (I) mentions some of the Fish obtained.

Iowa and *Missouri.* Jordan & Meek (A): list of Fishes collected, with descriptions of 3 new species.

Kansas. Cragin (B): a preliminary list of Fish from Kansas River. Evermann & Fordice: the Fishes collected in Harvey and Cowley Counties. Gilbert: (A) descriptions of 3 new Fish, and (B) notes.

Indiana. Eigenman & Fordice (A): a catalogue of the Fishes (40 species) of Bean Blossom Creek, Monroe County.

Beaufort Harbour. Jenkins adds 20 species to the list of Fish given by Jordan & Gill in 1878.

South Georgia. Fischer on Fish from this district in the Hamburg Museum.

Mississippi. Jordan (B): a new species.

Florida. Hay on new and little-known species. Jordan & Swain: descriptions of 3 new species.

Lower California. Smith: notes on Fishes collected at San Cristobal.

Tropical America. Jordan (H): 407 species are recorded, and a few observations made. Jordan differs from Günther's assumption, that nearly one-third of the species of marine Fishes on the two shores of tropical America would be found to be identical, and is of opinion that the two faunas are substantially distinct, only about 6 per cent. being common to the two coasts, and these only marine forms found in most warm seas.

Australia and Polynesia.

Philippine Islands. Gogorza gives a list of species.

Celebes, etc. Meyer: catalogue of 546 species of Fish obtained from 1870–73.

Australia. De Vis: new species. Ogilby (D): distribution of Sharks and Rays.

Port Jackson. Ogilby (A & C): new and rare species described.

Upper Murrumbidgee. Macleay: description of new species.

Tasmania. Johnston (A, B, & C): notes on the Fish, with descriptions of new and rare species.

New Zealand. Arthur: notes.

PALÆONTOLOGICAL.

[illegible]aypole. On the recent discovery of Pteraspidian Fish in the Upper [illegible]rian rocks of N. America.

Kiesow. On the Silurian and Devonian boulders of W. Prussia.

Cope. (B) The position of *Pterichthys* in the system.

Clarke. On the higher Devonian faunas of Ontario County, New York.

Newberry. New and remarkable Fish from the Carboniferous and Devonian of Ohio and Indiana.

TRAQUAIR. *Psephodus magnus*, Ag., from the Carbonife of Lanarkshire.

DAVIS. On *Heterolepidotus grandis* from the Lias.

THOMPSON. Fish from the Upper Lias of Northamptonshire.

BASSANI. (B) On Fish Otoliths from the Oolitic of Verona.

MARCK. Fish of the Chalk of Westphalia.

LAUBE. Contribution to the Fish Fauna from the Turon of Bohemia.

ZIGNO. Notes on Fish remains from the Mesozoic of the Venetian Alps.

KOENEN. Notes on some Fish Otoliths from Copenhagen.

BASSANI. (A) On the probable existence of the genus *Carcharodon* in the "*Terebratula diphya*" limestone.

COPE. (A) The Tertiary *Vertebrata* of the United States. [See HAYDEN.]

NOETLING. Fauna of the Tertiary of Prussia.

COPE. (C) [See *Polyodontidæ* and *Gonorhynchidæ*, from Eocene Shales of Wyoming Territory.]

FONTANNES. Contribution to the Pliocene Fauna of Drôme.

WOODWARD. Chapters on Fossil Sharks and Rays (continued from 1884).

PALÆICHTHYES.

CHONDROPTERYGII.

BEMMELEN. Ueber vermuthliche rudimentäre Kiemenspalten bei Elasmobranchiern.

HAACKE. (A) Ueber eine neue Art uterinaler Brutpflege bei Wirbelthieren.

JUNGERSEN. Remarks on the above paper.

KRUKENBERG. Ueber die chemische Beschaffenheit der sog. Hornfäden bei *Mustelus* und über die Zusammensetzung der Keratinösen Hüllen um den Eiern von *Scyllium stellare*.

LIST. (A) Ueber einzellige Drüsen (Becherzellen) in Cloakenepithel der Rochen.

MATTHEWS. On the oviduct of the Skate.

MAYER. Die unpaaren Flossen der Selachier.

OERLEY. Zur Physiologie der Haiembryonen.

RÜCKERT. Zur Keimblattbildung bei Selachiern.

SWAEN. Étude sur le développement des feuillets et des premiers ilôts sanguins dans le blastoderme de la Torpille (*Torpedo ocellata*).

TURNER. On the oviducts of the Greenland Shark.

PLAGIOSTOMATA.

SELACHOIDEI.

Carcharias crenidens, Klunz., = ? *C. acutus*, Rüpp.; Ogilby, (D) p. 464.

Galeocerdo dubius, sp. n. (foss.), p. 97, pl. v. fig. 6, and sp. indet., p. 99, pl. ix. figs. 6–10, Noetling, Tertiary of Prussia.

Sphenodus impressus, Zitt. (foss.), p. 152, figs. 17 & 18, and sp., p. 153, noted and otolith figured; Bassani, (B) pl. ii.

[illegible] siphodon, Ag. (foss.), p. 50, pl. iii. figs. 1–10, and sp. indet., p. 57, pl. x. fig. 5, described and figured by Noetling.

Lamna elegans, Ag. (foss.), p. 61, pl. iv. figs. 1–9, and sp. indet., p. 69, pl. x. fig. 4, described and figured; *id.*

Carcharodon sp. (foss.) noted and figured from the "*Terebratula diphya*" limestone; Bassani, (A) p. 76. *C. angustidens*, Ag. (foss.), p. 82, figs. 1–3, *obliquus*, Ag., p. 84, fig. 4, pl. vi., and sp. indet., p. 88, pl. x. figs. 1 & 2, described and figured; Noetling.

Otodus, Ag. (foss.), includes at least 3 distinct genera, *i.e.*, *Lamna*, *Oxyrhina*, and *Carcharodon*, and the species should be split up and placed in their proper genera; *O. obliquus*, Ag., is a *Carcharodon*, &c.; *id. t. c.* p. 84 (footnote).

Odontaspis hopei, Ag. (foss.), described and figured; *id.* p. 71, pl. v. figs. 1–3.

Alopias hassei, sp. n. (foss.), *id.* p. 75, pl. v. fig. 4, & ? pl. x. fig. 3, Tertiary of Prussia.

Selache glauconitica, sp. n. (foss.), *id.* p. 49, Tertiary of Prussia. *S. pennanti*, n. n. for Pennant's Basking Shark, which is not *maximus*, according to Cornish, (B) p. 351, and Day (F) p. 235.

Notidanus primigenius, Ag., described and figured by Noetling, p. 17, pl. i. figs. 4 & 5.

Scyllium hauchecornei, sp. n., *id.* p. 93, pl. v. fig. 5, & ? pl. viii. fig. 10, Tertiary of Prussia. *S. anale*, sp. n., Ogilby, (A) p. 445, Port Jackson; distinguished from *S. maculatum*, Bl., with which it has been confounded, (D) p. 464.

Chiloscyllium ocellatum, Gmel., recorded from Port Jackson; *id.* (D) p. 464.

Psephodus magnus, Ag., described and figured; Traquair, p. 392, pl. xvi. & p. 338, pl. viii.

Strophodus tenuis, Ag. (foss.), p. 146, figs. 1–3 & ? 4, ? *longidens*, Ag., p. 148, figs. 5–8, *tridentinus*, Zitt., p. 150, fig. 9, described and otoliths figured; Bassani, (B) pl. ii.

Squatina, Dum. (foss.), p. 262, notes on this genus; and *S. baumbergensis*, sp. n. (foss.); Marck, p. 264, pl. xxv., Upper Chalk of Westphalia. *S. beyrichi*, sp. n. (foss.), Noetling, p. 45, pl. vii. figs. 2–7, Tertiary of Prussia.

Læmargus borealis. Notes on the oviducts of this Shark, by Turner, p. 221.

Onchus murchinsoni, Ag. (foss.), p. 289, and *tenuistriatus*, Ag., p. 290, pl. iv. fig. 14: notes by Kiesow. *O. pennsylvanicus* and *clintoni*, spp. nn. (foss.), Claypole, p. 61 (woodcuts), Upper Silurian of Pennsylvania.

Pristacanthus vetustus, sp. n. (foss.), Clarke, p. 42, pl. i. fig. 7, Naples imbeds of Ontario County.

Pristiophorus cirratus. Note on the young; Haswell, p. 680.

BATOIDEI.

Doderlein. (B) Fish of the Mediterranean, pt. iii., *Batoidei*.

Rhynchobatus djeddensis, Forsk., recorded from Port Jackson; Ogilby, (D) p. 465.

Rhinobatus bougainvillei, M. & H., described and distin[illegible] *R. granulatus*, with which it has been confounded; Ogilby, (D) p. 464. *R. martensii*, sp. n. (foss.), Noetling, p. 31, pl. vii. fig. 1, Tertiary of Prussia; *R. vincentianus*, sp. n., Haacke, (A & C) pp. 489 & 508, S. Australia.

Raja chagrinea, Penn., notes, &c., by Doderlein, (A) p. 97. *R. clavata*, on a case of so-called hermaphrodism, where a fully-developed oviduct was found in an adult male fish; Matthews, p. 144, pl. ix. *R. borussica*, sp. n. (foss.), Noetling, p. 41, pl. ix. figs. 1–5, Tertiary of Prussia: *R. fusca*, p. 42, Japan, *scuta*, Massachusetts, and *jordani*, California, p. 43, spp. nn., Garman, (A).

Narcine timlei, Bl., notes; *id. t. c.* p. 42.

Astrape (?) *media*, sp. n. (foss.), Noetling, p. 36, pl. viii. figs. 6-9, Tertiary of Prussia.

Dasybatus, Klein, must be used instead of *Trygon*, Cuvier, unless there was a publication of the latter name between 1758 and 1810; a list is given of the species considered valid belonging to this genus: Garman, (B) p. 221. *D. pastinaca*, Walb., and *kuhlii*, M. & H., redescribed, *variidens*, sp. n., Hong Kong, *id.* (A) p. 40.

Stoasodon narinari, Euphrasen, described by Bean, (F) p. 192.

Taeniura lymma, Forsk., recorded from Cape York; Ogilby, (D) p. 465.

Urolophus (?) *bicuneatus*, sp. n. (foss.), Noetling, p. 34, pl. vii. fig. 8, & pl. viii. fig. 11, Tertiary of Prussia; *U. nebulosus*, Mexico, and *fuscus*, Japan, spp. nn., Garman, (A) p. 41.

Pteroplatea australis, sp. (n. descrip. nul.), Ogilby (D) p. 466.

Myliobates toliapicus, Ag. (foss.), described and figured by Noetling, p. 19, pls. ii. figs. 1 & 2, & viii. figs. 1 & 2. *M. goodei*, sp. n., Central America, and notes on *freminvillei*, Les.; Garman, (A) p. 39.

Aëtobates dixoni, Ag. (foss.), p. 24, fig. 3, and *irregularis*, Ag., p. 27, figs. 4 & 5, described and figured by Noetling, pl. ii. *A. narinari*, Euph., recorded from Cape Hawke; Ogilby, (D) p. 466.

HOLOCEPHALA.

Edaphodon bucklandi, Ag., described and figured by Noetling, p. 3, pl. i. fig. 1.

Elasmodus hunteri, Owen, described and figured by Noetling, p. 11, pls. i. figs. 2 & 3, & ii. fig. 6.

GANOIDEI.

AYRES. Beiträge zur Anatomie und Physiologie der Dipnoer.

MCMURRICH. The cranial muscles of *Amia calva*, L., with a consideration of the relations of the post-occipital and hypoglossal nerves in the various Vertebrate groups.

WRIGHT. (A) On the fate of the spiracular cleft in *Amia* and *Lepidosteus*.

——. (B) On the hyomandibular clefts and pseudobranchs of the same.

[illegible]. (c) On the function of the serrated appendages of the throat in *Amia*.

Pterichthys. Cope (b) has published some notes on the correct position of this genus, which he refers to the *Tunicata*! p. 289, woodcut.

Dinichthys newberryi, sp. n. (foss.), Clarke, p. 17, pl. i. fig. 1, Genesee Shales of Ontario County.

Pteraspis. Notes on the structure of the shield; Claypole, p. 51, woodcut.

Palæaspis, g. n. (foss.), near *Pteraspis*, for *P. americana* and *bitruncata*, spp. nn.; *id.* p. 62, woodcut, Upper Silurian of Pennsylvania.

Acanthodes (?) *pristis*, sp. n. (foss.), Clarke, p. 42, Naples beds of Ontario County.

Crassopholis magnicaudatus, Cope (foss.). Notes on a skull probably belonging to this species, and nearly allied to *Polyodon*, from the Eocene Green River shales; Cope, (c) p. 1090.

Mesodon gigas, Ag. Notes, and otolith figured; Bassani, (b) p. 158, pl. ii. figs. 10 & 11.

Lepidotus maximus, Wagner (foss.), pp. 80 & 154, figs. 12 & 13, *palliatus*, Ag., pp. 81 & 157, figs. 14–16. Notes, and otoliths figured; *id.* (a & b) pl. ii.

Dactylolepis, g. n. (foss.), apparently allied to *Lepidotus*, for *D. gogolinensis*, sp. n.; Kunisch, p. 588, Trias of Gogolau, Upper Silesia.

Polygnathus dubius, Hinde (foss.), from the Devonian of Ontario County; Clarke, pp. 17 & 40.

Paleoniscus devonicus, sp. n. (foss.), *id. t. c.* pp. 20 & 41, pl. i. figs. 2–6.

Amia scutata, Cope (foss.), pl. lx. fig. 1, and *dictyocephala*, Cope, pl. lix. fig. 1, p. 745, described and figured by Cope, (a), Tertiary of the United States. *A. clava*: on its osteology; Shufeldt.

Pappichthys sclerops, Cope (foss.), p. 57, fig. 1, *lævis*, Cope, p. 58, figs. 2–11, *plicatus*, Cope, p. 59, figs. 12–19, pls. iii. & iv. figs. 1–5, and *corsoni*, Cope, p. 60, pl. iv. figs. 21–36, described and figured; *id.*, from the Tertiary of the United States.

Pelargorhynchus dercetiformis, sp. n. (foss.), Marck, p. 261, Upper Chalk of Westphalia (*Hoplopleuridæ* of Günther).

Heterolepidotus grandis, sp. n. (foss.), Davis, p. 293, pl. vii., Lias at Lyme Regis.

TELEOSTEI.

Agassiz & Whitman (b) continue the papers on young stages of Osseous Fishes, commenced in 1877 by Agassiz.

Barrett. On the liver of a Haddock in which a Sand-eel was partly imbedded.

Brook. (a) On the origin of the hypoblast in pelagic Teleostean ova.

——. (b) On the development of *Motella mustela*.

——. (c) On the development of the Herring.

Cunningham. (a) On the relations of the yolk to the gastrula in Teleosteans.

——. (b) On the nature and significance of the structure known as Kuppfer's vesicle in Teleostean embryos.

EMERY. (B) On the morphology of the Pronephros in *Te*
GROSGLIK.]

GRASSI. Lo sviluppo della colonna vertebrale ne' pesci ossei.

HENNEGUY. On the primitive streak in Osseous Fishes.

JANOSIK. Partielle Furchung bei den Knochenfischen.

KLEIN. Beiträge zur Bildung des Schädels der Knochenfische, pt. ii.

MAURER. Mittheilung über die Schilddrüse und Thymus der Knochenfische.

OWSIANNIKOW. Studien über das Ei hauptsächlich bei Knochenfischen.

RYDER. (B) The development of the rays of Osseous Fishes; extract of a paper which will appear in the P. U. S. Nat. Mus.

——. (C) The author, taking *Lophius* as an extreme type of Physoclist Fish, in which the tendency to shift the pelvic limbs forwards is strongly marked, is of opinion that this must have commenced to manifest itself far back in the ancestral history of these Fishes, and that the *Physoclisti* have descended from the *Physostomi*.

——. (E) The development of the spines of the anterior dorsal of *Gasterosteus* and *Lophius*.

——. (F) On the formation of the embryonic axis of the Teleostean embryo by the concrescence of the rim of the blastoderm.

——. (H) On the manner in which the cavity of the heart is formed in certain Teleosteans.

——. (J) Gives a summary of our knowledge respecting the best-known of the truly viviparous Osseous Fishes characterized by an intrafollicular or intraovarian development. Long extracts are given from papers by American authors on this subject. The new observations recorded on the changes undergone by the embryos of the Embiotocids during gestation relate to the development of the intestine and the vascular supply of the median fins, both of these organs undergoing changes which appear to the writer to have considerable significance. The author also adds notes on the act of copulation and the birth of the young of *Gambusia*, as observed by Mr. A. A. Duly.

——. (K) On the development of the Salmon. 1 and 2. On the development of the vertical and paired fins; 3. The embryonic blood vascular system; 4. The diseases or abnormalities which involve the yelk sac and vitelline circulation of salmon embryos.

——. (L) A contribution to the development of Osseous Fishes, with special reference to the development of *Gadus morrhua*.

TICHOMIROFF. Zur Entwicklung des Schädels bei den Teleosteern.

WENCKEBACH. Development of the blood-corpuscles in the embryo of *Perca fluviatilis*.

WRIGHT. (A) On the auditory organ of *Hypophthalmus*.

ACANTHOPTERYGII.

PERCIDÆ.

Perca fluviatilis, L.: on the development of the blood-corpuscles in the embryo; Wenckebach, p. 231, pl. xi. *P. rhomboidalis*, L., = *Lagodon rhomboides*, auct., and must stand as *L. rhomboidalis*, L.; Goode &

201. Jordan, (I) p. 396, says *Sparus virginicus*, L., has priority over *P. rhomboidalis*, L., but is not synonymous with (*Diplodus*) *rhomboides*, L. *P. guttata*, L., = *Epinephelus lunulatus*, Poey, and stands as *E. guttatus*, L.; Goode & Bean, (A) p. 203, which in this case is synonymous with *E. apua*, Jordan, (I) p. 396. *P. lutea*, Raf., must be used instead of *americana*, Schranck; Jordan, (C) p. 72.

Roccus septentrionalis, Bl. & Schn., to be used for *saxatilis*, Bl. & Schn.; *id. ibid.*

Mioplosus abbreviatus, Cope (foss.), p. 88, *labracoides*, Cope, p. 89, fig. 1, *longus*, Cope, p. 90, fig. 3, *beani*, Cope, p. 91, fig. 2, pl. xii., and *sauvageanus*, sp. n., described and figured by Cope, (A), from the Tertiary of the United States.

Ammocrypta clara, sp. n., allied to *pellucida*; Jordan & Meek, (A) p. 8, Red and Sabine Rivers.

Boleosoma maculatum = *Pœcilichthys beani*, Jord.; Jordan, (A) p. 548.

Hadropterus variatus, Kirtl. (= *tessellatus*, Jord.), redescribed from specimen taken in White Water River, Indiana; Jordan, (F) p. 163. *H. aurantiacus*, Cope, described from North Carolina; Bean, (C) p. 165.

JORDAN & EIGENMAN have published some notes on the skeletal characters of 20 species of the group *Etheostomatinæ*, chiefly with regard to the upper parts of the cranium and number of vertebræ.

Etheostoma cragini, sp. n., Gilbert, (B) p. 99, Kansas; *E. iowæ*, sp. n., Jordan & Meek, (A) p. 10, Chariton River, Iowa; *E. jessiæ* = *asprigenis* Forbes, *iid. t. c.*; *E.* (*Ulocentra*) *davisoni*, sp. n., Hay, p. 554, Yellow River, Fla.

Pœcilichthys jessiæ = *swaini*, Jord., = ? *asprigenis*, Forbes; Jordan, (A) p. 548.

Caprodon schlegeli, Günth., = *Anthias longimanus*, Günth., = *Neoanthias guentheri*, Casteln.; Ogilby, (B) p. 231.

Anthias vivanus, sp. n., Jordan & Swain, p. 544, Pensacola, Fla.

Serranus furcus, Walb. Note by Jordan, (A) p. 546.

Epinephelus nigritus, Holb., described and distinguished from *morio*, and *Caulolatilus microps* also described, p. 232, with which Jordan had hinted it was synonymous; Bean, (H) p. 231. Note by Jordan, (G) p. 208.

Plectropoma nigro-rubrum, C. & V., described by Ogilby, (A) p. 119.

Polyprion cernium. Young described and figured; Emery, (A) p. 155, pl. x. fig. 14.

Rhypticus bistrispinosus, Mitch., = *maculatus*, Holb., = *Promicropterus decoratus*, Cope, and *R. saponaceus*, Bl., = *Eleutheractis coriaceus*, Cope; Jordan, (A) p. 546.

Helotes scotus, sp. n., Haacke, (B, C) pp. 507 & 508, S. Australia.

Pristipoma affine, sp. n., Fischer, p. 66, W. Africa.

Hæmulon arcuatum, C. & V.: note by Goode & Bean, (A) p. 207; also Jordan, (I) p. 396. *H. canna*, Ag., and *schranki*, Ag., p. 547, and *fremebundum*, Goode & Bean, p. 548: notes by Jordan, (A).

Oligorus gibbiceps, sp. n., Macleay, p. 267, Murrumbidgee River.

Murrayia jenkinsi, sp. n., *id.* p. 268, Murrumbidgee River.

Apogon imbrebis recorded from Newport, R. I.; Jordan, (A) p. 546. *A. roseus*, sp. n., Fischer, p. 66, Mozambique.

Lepomis humilis, Girard. Life colours given by Jordan [illegible] p. 12.

Aphredoderus. Blatchley (c) admits only one species, of which he gives the synonymy, p. 136.

Asineops squamifrons, Cope (foss.), p. 85, pl. ix. fig. 5, and *pauciradiatus*, Cope, p. 87, pl. xiv. fig. 1, described and figured by Cope, from the Tertiary of the United States.

Erismatopterus levatus, Cope (foss.), p. 80, pl. ix. figs. 6 & 7, *rickseckeri*, Cope, p. 81, pl. vi. fig. 2, and *endlichi*, Cope, p. 82, pl. xii. fig. 5, described and figured by Cope, (A), from the Tertiary of the United States.

Trichophanes foliarum, Cope (foss.), fig. 4, and *hians*, Cope, fig. 3, p. 753, pl. lix., Cope, (A), Tertiary of the United States.

Squamipinnes.

Platycornus gibbosus, V. d. M. (foss.), described and figured; Marck. p. 244, pl. xxi. fig. 1.

Mullidæ.

Mullidæ. Hall & McCaughan have attempted to collect the [illegible] synonymy of all the American genera and species of this family, which is given with notes and analytical keys, p. 149.

Sparidæ.

Sparus chrysops, L. & S., *argyrops*, L., were founded on specimens of the same species, which is the northern form. As indicated already by Bean, this form should be known as *Stenotomus chrysops*, and the southern as *S. aculeatus*. Goode & Bean, (A) pp. 194 & 199.

Pseudosphærodon, g. n. (foss.), near *Sphærodon*, p. 102, for *P. hilgendorfi*, sp. n., Noetling, p. 104, pl. xi. figs. 1–8, Tertiary of Prussia.

Cirrhitidæ.

Chilodactylus nigricans, Richards, = (? *Psilocranium coxii*, Macleay). On its occurrence in Tasmanian waters; Johnston, (A) p. lxv.

Latris lineata, Rich., described and figured; Arthur, p. 160, pl. xiv. fig. 1. *L. ramsayi*, sp. n., Ogilby, (A) p. 229, Port Jackson.

Scorpænidæ.

Scorpæna. Meek & Newland (B) review the 10 American species of this genus, with notes and synonymy; the 2 European species are included for comparison in the analytical key given; *Scorpæna dactyloptera* is not included, being referred to a separate genus, *Sebastoplus*; a list of nominal species with identifications is added, p. 394. *S. scrofa*: head figured by Emery, (A) pl. x. fig. 15. *S. fimbriata*, p. 195, and *kagoshimana*, p. 196, spp. nn., Steindachner & Döderlein, Japan.

Sebastes hirsutus, Hilgend., p. 202, pl. vii., *S. vulpes*, p. 203, and *elegans*, 205, spp. nn., Japan, *iid.*

Bathysebastes, g. n. 7 branchiostegals; upper surface of the head scaleless; the superficial headbones enclose a wide cavity; the gape is unusually distensible; bands of teeth on the jaws, vomer and palatines; dorsal scales cycloid; scales on the sides of the head covered over by the general skin. Other characters as in *Sebastes*. For *B. albescens*, sp. n. *Iid.* p. 207, Japan.

Pterois bleekeri, sp. n., *iid.* p. 200, pl. vi. fig. 1, Tokio.

Berycidæ.

Trachichthys trailli, Hutton, described and figured; Arthur, p. 162, pl. xiv. fig. 2.

Kurtidæ.

Pempheris poeyi, sp. n., Bean, (G) p. 229, Cuba; *P. lineatus*, sp. n., Ogilby, (A) p. 447, Port Jackson.

Trichiuridæ.

Lepidopus caudatus. Notes by Robson, p. 289.

Carangidæ.

Caranx carangus, Bl.: note by Vaillant, (A) p. 7. *C. delicatissimus*, sp. n., Steindachner & Döderlein, p. 184, Japan.

Decapterus russellii, Rüpp., p. 184, fig. 2, and *sanctæ-helenæ*, C. & V. (= *Caranx muroadsi*, Schl.), p. 185, fig. 1, described and figured; *iid.* pl. iv.

Zeus gallus, L., = *Selene argentea*, Lac., which must stand as *S. gallus*, L.; Goode & Bean, (A), p. 196. Jordan, (I) p. 395, doubts this statement, and thinks that the name *Selene vomer*, L., has priority. *Z. vomer*, L., = *Vomer setipinnis*, auct., which must stand as *V. vomer*, L.; Goode & Bean, (A) p. 196. Jordan, (I) p. 395, is of opinion that this species may have to stand as *Vomer setipinnis*.

Seriola cristata, sp. n., Steindachner & Döderlein, p. 187, Tokio.

Antigonia capros, Lowe. ♂ described and figured; *iid.* p. 187, pl. v.

Cyttidæ.

Zeus novæ-zealandiæ, sp. n., Arthur, p. 163, pl. xiv. fig. 3, off Otago.

Stromateidæ.

Centrolophus japonicus, sp. n., Steindachner & Döderlein, p. 183, Japan.

Coryphænidæ.

Coryphæna hippurus, L., described by Bean, (H) p. 232. A note by Stearns, p. 635.

Brama rajii, Bl., p. 172, *japonica*, Hilgend., p. 173, pl. i. *pinnis*, Lowe (= *Argo steindachneri*, Död.; *cf.* Zool. Rec. xx. *Pisces* p. 24), p. 174, described and compared; Steindachner & Döderlein.

Pteraclis (*Centropholis*) *petersii*, Hilgend., described and figured; *iid.* p. 175, pl. ii.

Scombridæ.

Omosoma monasterii, sp. n. (foss.), Marck, p. 245, pl. xxii. fig. i., Upper Chalk of Westphalia.

Orcynus schlegelii, sp. n.?, Steindachner & Döderlein, p. 178, pl. iii. fig. 1, Japan.

Auxis rochei, Risso (= *tapeinosoma*, Blkr., jun.), described; *iid.* p. 180.

Cybium sara, Vaillant, (B) notes, p. 21.

Echeneis remora. Description and figure of sucker; Niemiec, pl. v. fig. 6.

Trachinidæ.

Leptoscopus angusticeps, Hutton, var.? or *canis*, sp. n., Artl. Teleostean pl. xiv. fig. 4, New Zealand.

Trachinus sp. described and figured; Emery, (A) p. 156, pl. x. fig. armed

Percis novæ-cambriæ, sp. n., Ogilby, (A) p. 228, Port Jackson.

Neopercis to be substituted for *Parapercis*, Steind. (*nec* Bleek.), p. 212, footnote; *N. multifasciata*, p. 190, pl. vi. fig. 2, and *aurantiaca*, p. 191, pl. iii. fig. 2, spp. nn.: Steindachner & Döderlein, Japan.

Chænichthys georgianus, sp. n., Fischer, p. 50, pl. i. figs. 1 & 2, South Georgia.

Lopholatilus chamælionticeps. Notes on the local extinction of this and other species, accounted for by the fall of the temperature of the water caused by icebergs; Tarr, p. 29, woodcut.

Sclerocottus, g. n. Allied to *Harpagifer*, having the top of the head covered with granulated bony plates; for *S. schraderi*, sp. n. Fischer, p. 58, pl. i. figs. 3 & 4, S. Georgia.

Notothenia marmorata, p. 53, and *angustifrons*, p. 55, spp. nn., *id.*, S. Georgia.

Batrachidæ.

Meek & Hall review the American genera and species of this family.

Psychrolutidæ.

Neophrynichthys latus, Günth., described and figured; Arthur, p. 16, pl. xiv. figs. 5 & 5*a*.

Cottidæ.

Cottus scorpius: note on the ova; McIntosh, (C) p. 59. *C. maculatus*, sp. n., Fischer, p. 78, pl. ii. fig. 8, Barbadoes; is *bubalis*, Bean, (D) p. 166. *C. hilgendorfii*, sp. n., Steindachner & Döderlein, p. 208, Japan.

Ichthys schlegelii (= *percoides*, Gthr.), and *marmoratus*, 2 nn., *iid.* p. 210.

Platycephalus macrodon, sp. n., Ogilby, (A) p. 226, Port Jackson.

Trigla hirundo. On the young stages, &c.; Emery, (A) p. 149, pl. ix. figs. 7–10 & 12.

Prionotus palmipes: Allen gives notes on the use of the pectoral filaments in this species, p. 377. *P. stearnsi*, p. 541, and *ophryas*, p. 542, spp. nn., Jordan & Swain, Pensacola, Fla.

Cataphracti.

Agonus cataphractus, L. Note on the ova; McIntosh, (B) p. 433.

Aspidophoroides guentheri, sp. n., Bean, (B) p. 74, Alaska.

Peristethus cataphractus. On the young stages, &c.; Emery, (A) p. 149, pl. ix. figs. 1–6, 11, & 13.

Discoboli.

Liparis montagui, Donov.: note on ova; McIntosh, (B) p. 434, pl. xvi. fig. 5. Var. noted and figured by *id.* (C) p. 64, 1 pl. *L. steineni*, sp. n., Fischer, p. 63, S. Georgia.

Gobiidæ.

Gobius punctulatus, p. 87, *spilogonurus*, p. 88, and *fasciatus*, p. 113, spp. nn., Cocco, Sea of Messina.

Gobionellus smaragdus, C. & V., described by Hay, p. 552.

Lepidogobius lepidus, Girard, to be used for *gracilis*, Girard; Jordan, (C) p. 72.

Eleotridinæ (= the genus *Eleotris* of Günther). Eigenman & Fordice (B) are of opinion that there are 6 distinct genera, viz.:—*Gobiomorus*, *Dormitator*, *Gnavina*, *Eleotris*, *Erotelis*, and *Gymneleotris*. The synonymy of these genera and their species are given, with notes and analytical keys. A list of nominal species, arranged in chronological order, with their identifications, is added, p. 66. The above genera are based on skeletal characters.

Callionymus lyra, L. On the ova; McIntosh, (B) p. 480, pl. xiii.

Blenniidæ.

Anarrhichas lupus, L. On the ovaries; McIntosh, (B) p. 432, and (E) p. 57.

Blennius ocellaris, L., p. 294, *pavo*, Riss., p. 302, *gattorugine*, Willough., 1908, *tentacularis*, Brünn., p. 314, *sanguinolentus*, Dahl., p. 321, *rouxii*, Cocco, p. 329, *sphynx*, C. & V., p. 332, and *trigloides*, C. & V., p. 337, redescribed, with extensive notes and figures of nasal tentacles, &c.; Facciolà, (A) p. xxiv.

Rupiscartes atlanticus, C. & V., described by Smith, p. 551.

Labrosomus xanti and *nuchipinnis*. Notes by *id.* p. 553.

Trypterygium compressum, Hutton, described and figured; Arthur, p. 168, pl. xiv. fig. 6.

Peträlites, g. n., p. 226. Between *Clinus* and *Cristiceps*: stegals, six; body compressed, covered with small scales; snout ve. short, cleft of the mouth small; a band of moderate teeth on the jaws, lower jaw with a strong curved canine at either angle; vomerine teeth present; palate edentulous: first dorsal fin low, attached by a membrane to the second: dorsal slightly contiguous with the caudal. For *P. heptæolus*, sp. n., Ogilby, (A) p. 225, Port Jackson; also for *Cristiceps fasciatus*, Macl., and other species not mentioned.

Stathmonotus, g. n. Closely allied to *Muræoides*, from which it differs in having much smaller pectorals, while the ventrals are better developed and their position is more anterior. For *S. hemphillii*, sp. n., Bean, (E) p. 191, pl. xiii., Key West, Florida.

Zoarces viviparus, L. Note on the development of the young; McIntosh, (B) p. 430, pl. xvi. fig. 1, and (C) p. 57.

Sphyrænidæ.

Sphyræna hupferi, sp. n., Fischer, p. 70, Cameroon.

Mesogaster cretaceus, sp. n. (foss.), Marck, p. 247, pl. xxii. fig. 2, Upper Chalk of Westphalia.

Atherinidæ.

Atherina boieri, Risso. Notes and description; Depéret, p. 82.

Atherinichthys punctatus, sp. n., De Vis, p. 869, Cape York.

Mugilidæ.

Mugil convexus, p. 869, Cardwell, *marginalis*, p. 870, Brisbane, and *splendens*, p. 871, Cardwell, spp. nn., De Vis; *M. productus*, sp. n., Fischer, p. 69, W. Africa.

Gasterosteidæ.

Spinachia vulgaris, Flem. On its nesting; Möbius, pp. 56 & 153, and Prince, p. 487, pl. xiv.

Centriscidæ.

Amphisile cristata, sp. n., De Vis, p. 872, Noosa.

Gobiesocidæ.

Gobiesox mæandricus, Girard, to be used for *reticulatus*, Girard; Jordan, (C) p. 72.

Diplocrepis costatus, sp. n., Ogilby, (C) p. 270, Port Jackson.

Lepidogaster bimaculatus, Donov. Note on ova; McIntosh, (B) p. 434. *L. gouanii*: Niemiec describes and figures the sucker of this species.

Notacanthidæ.

Heptadecanthus brevipinnis, p. 872, Queensland Coast, and *maculosus*, p. 873, Cardwell, spp. nn., De Vis.

ACANTHOPTERYGII PHARYNGOGNATHI.

POMACENTRIDÆ.

Dascyllus carneus, sp. n., Fischer, p. 71, Mozambique.

Pomacentrus subniger, Cardwell, and *profundus*, Barrier Reef, p. 873, *apicalis*, Barrier Reef, and *frenatus*, Cardwell, p. 874, spp. nn., De Vis.

Glyphidodon expansus, sp. n., *id.* p. 875, Barrier Reef.

Heliastes immaculatus, sp. n., Ogilby, (A) p. 446, Port Jackson.

Priscacara serrata, Cope (foss.), p. 93, fig. 1, and *cypha*, Cope, p. 94, fig. 2, pl. xiii., *oxyprion*, Cope, p. 94, pl. xiv. fig. 5, *clivosa*, Cope, pl. xiii. fig. 3, and *pealei*, Cope, pl. viii. fig. 4, & pl. xiv. fig. 4, p. 96, *liops*, Cope, p. 97, pl. xiv. figs. 2 & 3, and *testudinarea*, Cope, p. 98, pl. i. fig. 7, described and figured by Cope from the Tertiary of the United States.

INCERTÆ SEDIS.

Onar, g. n. Pungent spines of the dorsal few; dentition labroid, none of the bones of the head curved; scales ctenoid; lateral line resumed; branchiostegals five. For *O. nebulosum*, sp. n., De Vis, p. 875, Murray I.

LABRIDÆ.

Labrus hiatula, L., is doubtless the "*Tautog*," and the species must stand as *Hiatula hiatula*, L., if a genus based on a mutilated specimen is worthy of retention; Goode & Bean, (A) p. 201. Jordan, (I) p. 396, calls attention to the name *Labrus onitis*, which has priority over *L. hiatula*.

Lachnolæmus maximus, Walb. Note by Jordan, (A) p. 546.

Cossyphus latro, sp. n., De Vis, p. 878, Queensland Coast.

Platyglossus punctatus and *amabilis*, Murray I., and *equinus*, Barrier Reef, spp. nn., *id.* p. 885.

Pseudojulis zigzag and *murrayensis*, spp. nn., *id.* p. 882, Murray I.

Julis ventralis, sp. n., *id.* p. 884, Moreton Bay.

Julichthys, g. n. Dorsal with eleven spines; posterior canine; scales of the thorax comparatively small; cheeks and opercules nearly naked; anterior canines, $\frac{2}{2}$; lateral line continuous. For *J. inornata*, sp. n., *id.* p. 884, Barrier Reef.

Coris hupferi, sp. n., Fischer, p. 73, Siberia; *C. coronata*, sp. n., De Vis, 883, Murray I.

Heteroscarus tenuiceps, sp. n., *id.* p. 883, S. Australia.

[H]ærops albigena, *olivaceus*, Cape York, and *concolor*, N.E. Coast, p. 876, *[im]aculatus*, Barrier Reef, and *perpulcher*, Moreton Bay, p. 877, and *graphicus*, Queensland Coast, p. 878, spp. nn., *id.*

Labrichthys mortonii, sp. n., Johnston, (C) p. 256, Tasmania; *L. guentheri*, Bleek. ?, described, *L. cruentatus*, p. 879, *sexlineatus*, and *rex*, p. 880, *maculatus* and *nudigena*, p. 881, spp. nn., De Vis, Moreton Bay and Barrier Reef.

Torresia lineata, sp. n., *id.* p. 881, Cardwell.

Coryphæna psittacus, L., is a *Xyrichthys* = *X. vermic*[illegible] which must stand as *X. psittacus*, L.; Goode & Bean, (A) p. 195.

Cryptotomus, Cope (= *Callyodon*, Cuv.). *C. roseus*, Cope, has nit. dorsal and two anal spines: Jordan, (A) p. 545.

Pseudoscarus flavipinnis, Cape York, and *strigipinnis*, Cardwell, p. 886, and *fuscus*, Barrier Reef, p. 887, spp. nn., De Vis.

Odax vittatus, Sol., var. described and figured; Arthur, p. 169, pl. xiv. fig. 7. *O. beddomei*, sp. n., Johnston, (B) p. 231, Tasmania.

ANACANTHINI.

Lycodidæ.

Gymnelichthys, g. n., most nearly allied to *Gymnelis*, Reinh.; for *G. antarcticus*, sp. n., Fischer, p. 61, pl. ii. fig. 9, S. Georgia.

Gadidæ.

Gadus morrhua. On its food; Cornish, (A) pp. 34, 71, & 114. Ryder, (L), the development. Ewart & Brook give notes on the spawning of fish which, with one exception, had been in a tank in the Rothesay Aquarium for four years.

Gadiculus argenteus, Guich., recorded for the first time as undoubtedly British, from Aberdeen; Day, (G) p. 312.

Molva vulgaris, Flem. Note on the young; McIntosh, (B) p. 435.

Phycis mediterranea. *Hypsiptera*, the larval form described and figured, Emery, (A) p. 159, pl. x. fig. 25. Figs. 22–24 are referred with doubt to this genus.

Motella mustela, L. Notes on the development; Brook, (B) p. 298, pls. viii.–x.

Ophidiidæ.

Leptophidium cervinum, p. 422, lat. 40° N., long. 69° 56′ W., 76 fath., and *marmoratum*, p. 423, lat. 23° 10′ N., long. 82° 20′ W., 213 fath., spp. nn., Goode & Bean, (B).

Neobythites, g. n., p. 600. Body brotuliform, much compressed, resembling *Bythites* in general appearance. For *N. gilli*, sp. n., Goode & Bean, (C) p. 601, N. lat. 28°, W. long. 85°, 111 fath.

Porogadus, g. n. Body brotuliform, much compressed; head with numerous spines on interorbital space, two pairs on the shoulders, one at angle of operculum, and a double series on angle of præoperculum; head with numerous mucous pores, as in *Bathyonus*; mouth large; sn[illegible] moderate, not projecting much beyond upper jaw, &c. For *P. mi*[illegible] sp. n., *iid. t. c.* p. 602, N. lat. 38°, W. long. 73°, 1168 fath.

Bathyonus, new generic name for *Bathynectes*, Gthr., preoccupied in *Crustacea*. *B. catena*, p. 603, 1467 fath., and *pectoralis*, p. 604, 1430 fath., spp. nn., *iid. t. c.*, N. lat. 28°, W. long. 87°.

Pteridium atrum, Risso: larval form described and figured; Emery, (A) p. 158, pl. x. fig. 21.

punctatus, sp. n., Fischer, p. 74, Mozambique.

Bellottia apoda, Gigl., described and figured; Emery, (A) p. 157, pl. x. figs. 17–20.

Macruridæ.

Macrurus carribæus, p. 594, Gulf of Mexico, 240 fath., *occa*, p. 595, N. lat. 28°, W. long. 86°, 335 fath., spp. nn., Goode & Bean, (C).

Coryphænoides sulcatus, sp. n., *id. t. c.* p. 596, off Martinique, 472 fath.

Malacocephalus occidentalis, sp. n., *iid. t. c.* p. 597, off Granada, 132–164 fath.

Bathygadus cavernosus, p. 598, 227 fath., and *longifilis*, p. 599, 724 fath., spp. nn., *iid. t. c.*, N. lat. 28°, W. long. 86°–87°.

Pleuronectidæ.

Hippoglossus vulgaris. A short biography of this species by Goode.

Citharichthys ventralis, sp. n., Goode & Bean, (C) p. 592, N. lat. 29°, W. long. 88°, 60 fath.; *C. macrops*, sp. n., Dresel, p. 539, Pensacola, Fla.

Hemirhombus fimbriatus, sp. n., Goode & Bean, (C) p. 591, N. lat. 28°, W. long. 84–85°, 24–88 fath.

Pleuronectes limanda and *flesus*. On a supposed hybrid between these species; Day, (E). *P. dentatus*, L., = *Paralichthys dentatus*, auct., = *P. ophryas*, J. & G.; Goode & Bean, (A) pp. 194 & 198.

Etropus rimosus, sp. n., Goode & Bean, (C) p. 593, N. lat. 28°, W. long. 84°, 21 fath.

Ammotretis zonatus, Macl. (renamed *macleayi*, because *zonatus* is "unsuitable and misleading"!), described by Ogilby, (A) p. 122.

Aphoristia diomedeana, p. 589, N. lat. 25°, W. long. 83° 21′, 24 fath., and *pusilla*, p. 590, N. lat. 40°, W. long. 69°–70°, spp. nn., Goode & Bean, (C). *A. plaguisa*, L., should not be applied to American specimens, which differ from Linné's type, and are better named *A. ornata*, Lac.; Goode & Bean, (A) p. 197. Jordan, (I) p. 395, says that *A. fasciata*, Holb., is apparently the correct name for the American form, which is distinct from *A. ornata*, the W. Indian species.

Bibronia lingulata, Cocco, redescribed by Facciolà, (B) p. 264.

Peloria heckeli, Cocco, redescribed; *id. t. c.* p. 265.

Charybdia, g. n. Body naked or scaly, moderately elongated, with both profils slightly convex; eyes little or very little asymmetrical; anterior extremity of the dorsal distinct from the head; two pectorals; caudal separate from dorsal and anal fins, p. 265. For *Peloria ruppelii*, Cocco, p. 265, and *rhomboidichthys*, sp. n., p. 266, *id. t. c.*, Sea of Messina.

PHYSOSTOMI.

Siluridæ.

Amiurus cragini, sp. n., Gilbert, (A) p. 512, Arkansas River, and (B) p. 10; = *A. melas*, Raf., *id. t. c.* p. 97.

Rhineastes peltatus, Cope (foss.), p. 63, figs. 1 & 2, *smithi*, Cope, p. 64,

figs. 5–11, *calvus*, Cope, p. 65, figs. 3 & 4, *arcuatus*, Cope, p. [illegible] *radulus*, Cope, p. 67, figs. 14–17, and *pectinatus*, Cope, p. 747, fig. pl. v., described and figured by Cope, (A), from the Tertiary of the United States.

SCOPELIDÆ.

Scopelus crocodilus, Risso, p. 461, and *elongatus*, Costa, p. 462. Notes, &c., by Vinciguerra.

CYPRINIDÆ.

Jordan (E) gives an identification of the species of *Cyprinidæ* and *Catostomidæ* described by Girard in the P. Ac. Philad. 1856. This useful work contains positive identifications of very many of his types not hitherto recognized, accompanied by a number of synonymic notes too numerous to be recorded. A few of these notes are taken from manuscripts of Meek, who has examined the series of Girard's types in the Academy of Philadelphia : pp. 118–127.

Ictiobus velifer, Raf. : notes by Jordan & Meek, (A) pp. 2 & 16 ; the authors have as yet been able to distinguish 3 species only as belonging to the group *Carpiodes*, viz., *I. velifer*, Raf., *cyprinus*, Le S., and *carpio* ; it still remains a matter of doubt whether *I. timidus*, *damalis*, *grayi*, *thomsoni*, *bison*, *selene*, *cutisanserinus*, and *difformis* are really distinct species, or merely varieties of one polymorphous species, *velifer*. *I. bubalis* and *carpio*, Raf. : on these and allied species ; *iid. t. c.* p. 13.

Amyzon mentale, Cope (foss.), pls. lix. fig. 2, & lx. fig. 2, *commune*, Cope, pl. v. fig. 21, p. 749, *pandatum*, Cope, p. 750, and *fusiforme*, Cope, p. 751, described and figured ; Cope, (A), Tertiary of United States.

Catostomus teres, Mitch. Notes on the coloration ; Gilbert (B) p. 10.

Moxostoma valenciennesi, n. n. for *Catostomus carpio*, C. & V. (*nec* Raf.) ; Jordan, (C) p. 73.

Campostoma anomalum, Raf. Coloration in young ; Gilbert, (B) p. 11.

Hybognathus nuchalis, Ag.: *id. t. c.* p. 12, remarks that Girard's species, *argyritis*, *evanei*, and *placitus* cannot be distinguished from *nuchalis*, of which a diagnosis is given. *H. nuchalis*, Ag. : notes on the life-colours ; Jordan & Meek (A) p. 2. *H. hayi*, sp. n., Jordan, (A) p. 548, Mississippi.

Pimephales. Blatchley (B) is of opinion that *Hyborhynchus* is unworthy of retention, and that there are only 2 species, *P. promelas* and *notatus*, and of these the synonymy and notes are given, p. 63. *P. promelas*, Raf.: notes on this species, the young of which is identified as *Coliscus parietalis*, Cope ; Jordan & Meek, (A) pp. 3 & 9.

Leuciscus idus, L., described and figured ; Sundman, pt. v. p. 1, pl. xiii.

Cliola vigilax (B. & G.) = *C. velox*, and *vivax*, Girard, = *Hybopsis tuditanus*, Cope, = *Alburnops taurocephalus*, Hay : Jordan & Meek, (A) p. 3. *C.* (*Hybopsis*) *topeka*, sp. n., Gilbert, (A) p. 513, and (B) p. 13, Kansas River.

Hybopsis storerianus (Kirtl.) = *Ceratichthys lucens*, Jord., and *dissimilis*, Kirtl., noted by Jordan & Meek, (A) pp. 6 & 7. *H. gelidus*, Girard,

N[illegible] ad life-colours given; *iid. t. c.* p. 13. *H. montanus*, sp. n., [illegible] p. 526, Upper Missouri.

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Phenacobius mirabilis, Girard. Notes by *iid. t. c.* p. 6.

Platygobis pallidus, Forbes, is probably the young of *P. gracilis*, Richards; *iid. t. c.* p. 13.

Semotilus. Bicknell & Dresslar give a review of this genus, distinguishing 3 species (*S. atromaculatus*, *thovenianus*, and *bullaris*), of which notes and the synonymy are given, p. 14.

Notemigonus americanus and *chrysoleucus*, Mitch., are geographical varieties of the same species; Jordan & Meek, (A) p. 16. *N. bosci*, C. & V., to be used for *americanus*, L.; Jordan (C) p. 73.

Cyprinis carpio, E. How to distinguish sex; Smiley, p. 36.

Aspius alburnus, L., described and figured; Sundman, pt. v. p. 3, pl. xiv.

Schizothorax kolpakowskii, sp. n., Nikolski, p. 12, Balchasch Sea.

Cyprinodontidæ.

Zygonectes nottii, Ag., redescribed, p. 557, and *auroguttatus*, sp. n. (= *rubrifrons*, Jord., = probably *henshalli*, Jord., fide Bean); Hay, p. 556, Florida.

Heterandria ommata, Jordan (= *Zygonectes mannii*, sp. n., Hay), described by *id.* p. 555.

Umbridæ.

Notes on the differences and synonymy of *Umbra limi*, Kirtl., and *pygmæa*, De Kay; Blatchley, (A) p. 12.

Scombresocidæ.

Exocœtus. Notes on "Flying Fish"; Carpenter & Mitchell. Jordan & Meek (B) give a review of the American species of this genus, which may be regarded as supplementary to Lütken's paper published in 1876. The authors divide the group into 4 genera or subgenera, *i.e.*, *Fodiator* (g. n., resembling *Parexocœtus* in dentition and general characters, but differing in the form of its jaws, which indicate a transition towards

figs. 5–11, *calvus*, Cope, p. 65, figs. 3 & 4, *arcuatus*, Cope, p. [illegible] *radulus*, Cope, p. 67, figs. 14–17, and *pectinatus*, Cope, p. 747, fig. pl. v., described and figured by Cope, (A), from the Tertiary of the United States.

SCOPELIDÆ.

Scopelus crocodilus, Risso, p. 461, and *elongatus*, Costa, p. 462. Notes, &c., by Vinciguerra.

CYPRINIDÆ.

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Hemirhamphus), *Parexocœtus*, *Halocypselus*, and *Exocœtus*. ... cal key is given, by which the genera and species may be distinguis... A list of the nominal species with their identifications is added, and tab... showing their distribution and questions of doubt still remaining to be solved. 17 species are admitted as valid, and 1 is renamed *Exocœtus vinciguerra* (= *rondeleti*, Lütk., &c., *nec* C. & V.), p. 56. *E. melanocercus* sp. n., Ogilby, (A) p. 123, Port Jackson.

Esocidæ.

Esox. Meek & Newland (A) review this genus, and distinguish 5 species, of which notes, synonymy, and an analytical key are given. A list of nominal species, with their identifications, is added.

Mormyridæ.

Gymnarchus niloticus. On its organization; Fritsch, p. 112, with 2 woodcuts.

Salmonidæ.

Lidth de Jeude. On deformities of the head of *Salmonidæ*.

Garman. (B) American Salmon and Trout, including introduced forms.

Salmonidæ. Jordan (D) has written some notes and criticisms on Garman's above paper, and points out that the discrepancies between the results of this author and those reached by Bean, Gilbert, and himself, "are more in name than in fact." *Salmo hoodi*, Richards., part, = *fontinalis*, part, *namaycush*, pp. 81–83.

Day. (A) On the breeding of Salmon from parents which have never visited the sea. (D) A further account of the Howietoun experiments comprising the period during which the ova of hybrid *Salmonidæ* have been incubating; and (I) on the breeding.

Fiedler on the migration of the Salmon in the Baltic.

Salmo salar, L., pl. xviii., and *ferox*, L., pls. xvi. & xvii., described and figured; Sundman, pt. vi. pp. 1–12.

Osmerus eperlanus, L., described and figured; *id.* pt. v. p. 5, pl. xv.

Osmeroides lewesiensis, Mantell (foss.), described and figured from the Turon of Bohemia; Laube, p. 292, pl. i. figs. 2 & 3, woodcut.

Fatio distinguishes among the 24 forms of *Coregonus* found in the Swiss lakes the following: *Coregonus dispersus*, p. 660, and *balleus*, p. ... spp. nn., *suidteri*, n. n., and *hiemalis*, Jurine, intermediate forms, p. ... pls. xxii. & xxiii.

Gonorhynchidæ.

Notogoneus osculus, g. & sp. nn. (foss.), Cope, (C) p. 1091, Eocene Green River Shales of Wyoming Territory.

Osteoglossidæ.

Dapedoglossus, Cope, (foss.), notes, p. 68, *encaustus*, Cope, p. 70, pl. vi. fig. 1, *testis*, Cope, p. 71, pl. vii. fig. 1, & pl. viii. figs. 1 & 2, *acutus*, Leidy, p. 72, pl. v. figs. 18–20, and *æquipinnis*, Cope, p. 73, pl. vii. fig. 2, described and figured by Cope, (A), from the Tertiary of the United States.

Clupeidæ.

On movements and food, &c., of Herrings, see Brook (C), Dunn, Ljungman, and Pearcey.

Clupeidæ. A specimen is figured by Fontannes from the Pliocènes of Drôme, said to be the type of a new fossil family of Herrings; p. 423, pl., fig. 1.

Clupea harengus: on spawning; McIntosh, (B) p. 429. *C. sprattus*, L., p. 471, and *aurita*, C. & V., p. 474; notes by Vinciguerra. *C. mirabilis*, Gir., = *Spratelloides bryoporus*, Cope; Jordan, (A) p. 546. *C. thrissa*, L., is an Indo-Pacific species of *Opisthonema*; the Carolina specimens referred by Linnæus to that species were *Dorosoma cepidianum*; the American *Opisthonema* must probably be called *O. oglina*, Les.: Goode & Bean, (A) p. 206.

Pellonula modesta, sp. n., Fischer, p. 75, West Africa.

Protelops, g. n. (foss.) for *P. geinitzii*, sp. n., Laube, p. 286, pl. i. fig. 1, and woodcut, Turon of Bohemia. A comparative table is given (p. 291) showing the difference between this genus and its allies, *Elops*, L., and *Elopsis*, Heck.

Sardinius robustus, V. d. M. (foss.), described and figured; Marck, p. 254, pl. xxiii. fig. 1.

Sardinioides minutus, p. 255, fig. 2, and *macropterygius*, p. 256, fig. 3, spp. nn. (foss.), *id.* pl. xxiii., Upper Chalk of Westphalia.

Charitosomus, g. n. (foss.), for *C. formosus*, sp. n., *id.* p. 25, pl. xxiv. fig. 1, Upper Chalk of Westphalia.

Thrissopteroides intermedius, sp. n. (foss.), *id.* p. 258, pl. xxiv. fig. 2, Upper Chalk of Westphalia.

Leptolepis concentricus, (foss.), Thompson, p. 196, pl., figs. 2 & 4, from the Lias of Northamptonshire.

Diplomystus dentatus, Cope (foss.), p. 74, pl. x. fig. 1, *analis*, Cope, p. 75, pl. vii. fig. 4, pl. viii. fig. 3, & pl. x. fig. 2, *pectorosus*, Cope, p. 76, pl. x. fig. 3, *theta*, Cope, p. 77, *humilis*, Liedy, p. 77, pl. ix. fig. 8, & pl. x. fig. 4, and *altus*, Leidy, p. 79, pl. xvii. fig. 2, described and figured by Cope (A), from the Tertiary of the United States.

Muræniдæ.

Notes on the male organs and reproduction of the Eel; Ryder (I), and Southwell.

PLECTOGNATHI.

Monacanthus (*Aluteres*) *fuscus*, sp. n., Fischer, p. 75, pl. ii. fig. 6, Cameroon.

CYCLOSTOMATA.

Petromyzon castaneus, Girard. Notes on the occurrence of this species in Kansas ; Cragin, p. 99.

LEPTOCARDII.

Ryder: (6). On the availability of embryological characters in the classification of the *Chordata*.

TUNICATA.

BY

PROF. W. A. HERDMAN, D.Sc., F.L.S.

LIST OF PUBLICATIONS.

1. BARROIS, J. Recherches sur le cycle génétique et le bourgeonnement de l'Anchinie. J. de l'Anat. Phys. xxi. pp. 193–267, pls. viii.–xii. [Abstract, J. R. Micr. Soc. (2) v. p. 630.]
2. BENEDEN, E. VAN, & JULIN, C. Recherches sur le développement postembryonnaire d'une Phallusie (*Phallusia scabroides*). Arch. Biol. v. pp. 611–638, 1 pl. [Abstract, J. R. Micr. Soc. (2) v. p. 795.]
3. ——, & ——. Recherches sur la morphologie des Tuniciers. *Op. cit.* vi. pp. 237–476, pls. vii.–xvi.
4. ——, & ——. Des orifices branchiaux externes des Ascidies et la formation du cloaque, &c. Bull. Ac. Belg. (3) viii. pp. 631–646, 1 pl.
5. CHABRY, L. La segmentation des Ascidies simples. J. de l'Anat. Phys. xx. pp. 387–392.
6. DELAGE, Y. [See LACAZE-DUTHIERS.]
7. DRASCHE, R. VON. Ueber einige Molguliden der Adria. Verh. z.-b. Wien, xxxiv. pp. 159–170, pls. vi. & vii.
8. HERDMAN, W. A. The Hypophysis cerebri in *Tunicata* and *Vertebrata*. Nature, xxviii. [1883] pp. 284–286.
9. ——. Report on the *Tunicata* collected during the Cruise of H.M.S. 'Triton,' in the Summer of 1882. Tr. R. Soc. Edinb. xxxii. pt. 1, pp. 93–117, pls. xvi.–xx.
10. ——. On the Evolution of the Blood-vessels of the Test in the *Tunicata*. Nature, xxxi. pp. 247–249.
11. ——. On a New Organ of Respiration in the *Tunicata*. P. Liverp. Soc. xxxix. pp. 39–46, pl. ii.
12. ——. Note on the Armature of the Branchial Siphon in some Simple Ascidians. *T. c.* pp. 203 & 204.

13. [Herdman, W. A.] Report upon the *Tunicata* collected during the Cruises of H.M.SS. 'Lightning' and 'Porcupine.' Tr. R. Soc. Edinb. xxxii. pt. 2, pp. 219–231, pls. xxv. & xxvi.

14. ——. The Presence of Calcareous Spicula in the *Tunicata*. P. Geol. Soc. Liverp. 1884–85, pp. 42–45.

15. Jourdain, S. Sur les Ascidies composées de la tribu des *Diplosomidæ*. C.R. c. pp. 1512–1514. [Abstract, J. R. Micr. Soc. (2) v. p. 796.]

16. Julin, C. [See Beneden.]

17. Lacaze-Duthiers, H. de, & Delage, Y. Les Cynthiadés des côtes de France. C.R. ci. pp. 784–790.

18. Lahille, F. Les contractions alternantes du cœur chez les Tuniciers. Bull. Soc. Toulouse, xix. pp. 13–23.

19. Roule, L. Sur trois nouvelles espèces d'Ascidies simples des côtes de Provence. C.R. c. pp. 1015–1017.

20. ——. Recherches sur les Ascidies simples des côtes de Provence. i. Phallusiadées. Ann. Mus. Marseille, ii. Mém. i. 270 pp., 13 pls.

21. ——. Recherches sur les Ascidies simples des côtes de Provence. 3me partie. Bibl. haut. études, xxxi. Art. 8, pp. 1–229, pls. i.–xiii.

22. Sabatier, A. Sur les œufs des Ascidiens. Mém. Ac. Montp. x. pp. 429–480. [Abstract, J. R. Micr. Soc. (2) v. p. 987.]

23. Seeliger, O. Die Entwicklungsgeschichte der socialen Ascidien. Jen. Z. Nat. xviii. pp. 528–596.

24. ——. Die Knospung der Salpen. *Op. cit.* xix. pp. 573–677, 10 pls.

25. Sluiter, C. P. Ueber einige einfachen Ascidien von der Insel Billiton. Nat. Tijdschr. Nederl. Ind. xlv. pp. 160–232, pls. i.–ix.

26. Traustedt, M. P. A. Bidrag til Kundskab om Salperne. Dan. Selsk. Skr. (2) viii. pp. 337–400, pls. i. & ii.

27. ——. *Ascidiæ Simplices* fra det Stille Ocean. Vidd. Medd. 1885, pp. 1–60, pls. i.–iv.

28. Ulianin, B. Bemerkungen über die Synascidiengattung *Distaplia*, D. V. Zool. Anz. viii. pp. 40–44.

29. Wagner, N. Die Wirbellosen d. Weissen Meeres. i. Leipzig: 1885, *Tunicata*, pp. 121–167, pls. xv.–xxi.

30. ——. Sur quelques points de l'organisation de l'Anchynie. Arch. Z. expér. (2) iii. pp. 151–188, pls. vii.–ix.

Anatomy.

Sluiter (25) finds in his new species of *Ecteinascidia* that the ovary is enclosed by the spermatic vesicles, while Herdman described the testis as being central in *E. turbinata*, found by the 'Challenger' at Bermuda. The new genus, *Styeloides*, is described by Sluiter as having the alimentary canal, including the branchial sac, entirely absent, while the

appears to perform the respiratory and digestive functions! Only a single specimen of this remarkable form is known, and it is difficult to believe that it is not an individual abnormality. Sluiter finds transition forms between the closely-allied genera *Styela* and *Polycarpa*, and is unable to recognize any good distinction between them.

Herdman (11) points out the remarkable development which the blood-vessels of the test assume in some groups of Simple and Compound Ascidians, and suggests that they may possibly act as an accessory respiratory system. He discusses also (10) the probable steps by which such a complicated system was evolved from the simple blood-vessels of the stolon of the ancestral *Clavelinidæ*.

A detailed account of the minute anatomy of a form of *Anchinia*, without reproductive organs, from the Bay of Naples, is given by Wagner (30).

Lacaze-Duthiers & Delage (17) describe the structure of *Cynthia morus*, which they take as a type of the French *Cynthiidæ*.

Herdman (12) points out that the minute scale-like structures lining the branchial siphon, described by Lacaze-Duthiers, were figured, in the case of *Cynthia arenosa*, in 1882, in the 'Challenger' Report.

Wagner (29, p. 124) gives a detailed account of the organization of *Molgula grœnlandica*, and especially of its circulatory system. He also describes more briefly some other species of Simple Ascidians. He draws attention to the prevalence of short-bodied species in the White Sea, and regards them as simpler and more primitive than long-bodied forms. He considers *Chelyosoma* as a very primitive form, on account of its flattened shape.

Herdman (14) points out that calcareous spicules, apparently capable of being preserved in a fossil condition, exist in several distinct groups of *Tunicata*, and should be looked for by palæontologists. [Such spicules, apparently belonging to the *Didemnidæ*, have since been discovered by Mr. Kendall, at St. Erth, Cornwall.]

Roule (20) gives a detailed account of the anatomy and histology of *Ciona intestinalis*, as a type of the *Phallusiadæ* (*Ascidiidæ*), and describes more briefly the other species of the family occurring on the shores of Provence. He divides the old genus *Phallusia* (*Ascidia*) into three new generic groups—*Ascidiella*, *Ascidia*, and *Phallusia*. He also (21) redescribes, with anatomical details, many of the old and imperfectly known species of Savigny and others.

Physiology.

Lahille (18) describes the results of his observations and experiments upon the beating of the heart in various *Tunicata*. He notes considerable irregularity and modification under abnormal circumstances, and after treatment with carbonic acid or removal of the nerve ganglion.

Development.

Sabatier (22) discusses the structure of the ovary of Ascidians and the formation of the ova. He finds that the follicle-cells are formed

from the yolk of the ovum. The testa-cells, or granular cel[illegible] structures eliminated from the ovum.

E. VAN BENEDEN & C. JULIN (2 and 4) discuss the post-embryonic development of *Phallusia scabroides*, especially the formation of the atrium, the stigmata of the branchial sac, the renal vesicles, the reproductive organs, the visceral ganglionic cord, the dorsal tubercle, and the circle of tentacles. The cloaca or median dorsal part of the atrium is formed by a depression of the dorsal surface of the larva between the two embryonic atrial apertures, and is therefore lined throughout by epiblast; while the peribranchial cavity has its inner wall formed by hypoblast. The primary stigmata first formed in the young Ascidian become broken up each into a row of secondary stigmata. The cavities of the renal vesicles, as well as of the reproductive organs, probably represent the cœlom of the *Vertebrata*. The visceral ganglionic cord is derived, not from the spinal cord of the larva, but from the visceral ganglion.

ULIANIN (28) shows that in *Distaplia* the stolon arises in the larva before the tail is lost, and produces buds, so that a young colony is formed while the larva is still free swimming. The ascidiozooids are protandrous, the testes being produced before the ovaries. The adult colony, according to Ulianin, contains some ascidiozooids which have not been produced by gemmation, but have developed from ova through larvæ which have remained in the common test in place of becoming free-swimming.

CHABRY (5) describes the segmentation of Simple Ascidians, with the view of supplementing the account given by Van Beneden & Julin, and of showing that it differs very slightly from a regular segmentation.

SEELIGER (23) continues his account of the development of *Clavelina*, and deals specially with the process of gemmation and the bearing of the life-history upon the phylogenetic relations of the different groups of *Tunicata*.

E. VAN BENEDEN & C. JULIN (3) have shown that in *Clavelina* the first segmentation plane corresponds to the median plane of the gastrula and of the future body. They have studied the details of the segmentation and development of the embryo, and have corrected some errors into which Seeliger had fallen. The mesoblast arises in two portions—a posterior, which gives rise to the muscles of the tail, and an anterior, which forms from lateral diverticula of the archenteron (consequently the *Tunicata* must be regarded as *Enterocœla*). The cœlomic cavities in these diverticula become obliterated very early, and never undergo metameric segmentation. The cells of the mesoblast become scattered through the blastocœle, and thus form a secondary, or false, mesenchyme. After a detailed study of the oogenesis in *Clavelina*, they confirm Kowalevsky's original idea that the testa-cells are derived from the follicle epithelium. From a close comparison of the development in *Clavelina* and in *Amphioxus*, they consider that the Ascidians cannot properly be regarded as segmented animals, and that the body of an adult Ascidian, *Salpa* or *Doliolum*, is the equivalent of the cephalic segment and the first mesoblastic segment only of the larval *Amphioxus*. They conclude that the

...ness; the *Tunicata* is an organ peculiar to that group, and is not homologous with the heart of the *Vertebrata*. They consider all the various theories as to the phylogenetic origin of the *Tunicata* in the light of their own valuable contributions to the embryology and morphology of the group, and arrive at the conclusion that the *Urochorda*, the *Cephalochorda*, and the *Vertebrata* are to be regarded as derived from three independent lines, which arose at the same point from the *Protochordata*.

The process of gemmation in *Salpa*, from the formation of the stolon to the completely developed "chain," is given in detail by SEELIGER (24).

BARROIS (1) gives a detailed account of the process of gemmation in *Anchinia*. The stolon, unlike that of other *Thaliacea*, is formed by a solid cord of endoderm, covered by a layer of ectoderm. Each bud is formed as an outgrowth consisting of an ectodermal covering, inside which is an endodermal mass composed of different kinds of cells, which soon separate into a central portion, the endoderm proper, surrounded by a group of nerve cells, a group of reproductive cells, and some scattered cells. The endoderm becomes partially divided into two masses, placed ventrally—the pharyngeal and the intestinal. It is placed in communication with the exterior by the buccal and the anal apertures. The nerve cells are placed dorsally, and form a tube with terminal enlargements, from the anterior of which the subneural gland is formed. The atrium is formed as two short tubes, derived from the ectoderm, which place the pharyngeal cavity in communication with the exterior. The reproductive cells are placed posteriorly in the bud. In the sterile zooids they remain undeveloped.

PHYLOGENY.

SEELIGER (24) discusses the phylogeny of the *Tunicata*. He considers that the ancestral stem, after the separation of the *Appendicularriidæ*, gave rise to two divergent branches—one leading to the Simple, Social, and Compound Ascidians, and the other to the *Pyrosomatidæ*, *Salpidæ*, and *Doliolidæ*.

[See also under DEVELOPMENT, and under THALIACEA.]

GEOGRAPHICAL DISTRIBUTION.

SLUITER (25) describes 16 species of Simple Ascidians, 12 of them new to science, and one new variety, from the Island of Billiton, in the Malay Archipelago.

The Simple Ascidians of the coast of Provence are fully treated by ROULE (20 & 21). He has found representatives of the families *Ascidiidæ*, *Cynthiidæ*, and *Molgulidæ*, belonging to 13 genera or subgenera, and comprising altogether 28 species, some of which are new. He discusses their distribution according to the depth, the nature of the bottom, and the condition of the water, and also shows their occurrence, so far as is known, in other seas.

VON DRASCHE (7) records 4 species, 3 of them new, of *Molgulidæ*, from the Adriatic.

TRAUSTEDT (27) enumerates upwards of 70 species of Ascidians which have been found in the Pacific Ocean; 7 of these he describes as new.

WAGNER (29) records 10 species of Simple and 1 of Compound Ascidians from the White Sea, including 2 new species of *Molgula* and 1 of *Cynthia*.

HERDMAN (9 and 13) records the *Tunicata* found in the N. Atlantic during the 'Lightning,' 'Porcupine,' and 'Triton' expeditions.

TRAUSTEDT (26) discusses the geographical distribution of the *Salpidæ* throughout the great ocean basins.

ASCIDIACEA.

ASCIDIÆ SIMPLICES.

CLAVELINIDÆ.

SLUITER (25) supports Herdman's view that this family should be regarded as belonging to the *Ascidiæ Simplices*. He has found at Billiton, in the Malay Archipelago, two new species of the genus *Ecteinascidia* which show intermediate characters between the *Clavelinidæ* previously known and such typical Simple Ascidians as the *Ascidiidæ*.

The process of gemmation and life-history of *Clavelina* are discussed by SEELIGER (23).

E. VAN BENEDEN & C. JULIN (3) give an account of the development of *Clavelina*. [See Development.]

Ecteinascidia rubricollis and *E. diaphanis*, spp. nn., Sluiter, (25) pp. 163 & 168.

ASCIDIIDÆ.

Phallusia (*Ascidia*) *suensonii* and *P.* (*Ascidia*) *koreana*, spp. nn., Traustedt, (27) pp. 13 & 14; *P. scabroides*, sp. n., E. van Beneden & C. Julin, (2) p. 611.

Ascidia virginea var. n., p. 98, and *A. tritonis*, sp. n., p. 96, Herdman (9); *A. marioni*, sp. n., Roule, (20) p. 240; *A. melanostoma*, sp. n., Sluiter, (25) p. 172.

Ascidiella, g. n. [a section of *Ascidia*], *A. lutaria*, sp. n., Roule, (20) p. 220.

CYNTHIIDÆ.

ROULE (21) discusses the characters of this family, and its division into subfamilies and genera. He adopts Herdman's classification into *Boltenineæ*, *Cynthineæ*, and *Styelineæ*, and describes various species belonging to the two latter subfamilies.

Microcosmus sabatieri, sp. n., Roule, (21) p. 194; *M. gleba*, sp. n., Traustedt, (27) p. 41.

Cynthia pallida (Heller) var. *billitonensis*, var. n., Sluiter, (25)

C. japonica, sp. n., Traustedt, (27) p. 30; *C. hilgendorfii*, sp. n., *id.* (27) p. 36; *C. corallina*, sp. n., Roule, (21) p. 183; *C. nordenskjöldii*, sp. n., Wagner, (29) p. 157.

Styela oligocarpa, p. 187, *S. patens*, p. 190, *S. papillata*, p. 192, *S. procera*, p. 196, *S. captiosa*, p. 202, *S. herdmani*, p. 205, *S. cryptocarpa*, p. 210, and *S. spiralis*, p. 214, spp. nn., Sluiter (25).

Styeloides, g. n., *S. abranchiata*, sp. n., *id. t. c.*, p. 219.

Polycarpa pusilla (N. Atlantic), p. 224, *P. formosa* (Tangier Bay), p. 227, and *P. curta* (59° 36′ N., 7° 20′ W.), p. 226, spp. nn., Herdman (13).

Molgulidæ.

This family and some of its genera are briefly discussed by Roule (21).

The anatomy of *Molgula grœnlandica* is described in detail by Wagner (29).

Eugyra adriatica, sp. n, Von Drasche, (7) p. 160.

Eugyriopsis, subg. n., p. 205, of *Molgula*, *E. lacazei*, sp. n., Roule (21). This is the species which Roule had previously named provisionally as *E. intermedia* (19).

Molgula helieri and *M. euprocta*, spp. nn., Von Drasche, (7) pp. 162 & 163; *M. martensii*, sp. n., Traustedt, (27) p. 19; *M. longicollis* and *M. nuda*, spp. nn., Wagner, (29) pp. 153 & 154.

Paramolgula, g. n., *P. schulzii*, sp. n., Traustedt, (27) p. 20.

Ascidiæ Compositæ.

The family *Diplosomidæ* is briefly discussed by Jourdain (15). He changes *Astellium*, Giard, to *Brevistellium*. His observations show that the two buds described by previous observers as forming by their union a single ascidiozooid, really arise as a single outgrowth from the œsophageal region of the parent. He proposes that the *Diplosomidæ* should be united with the *Leptoclinidæ* (*Didemnidæ*), under the title *Oligosomidæ*.

Pseudodidemnum zosterarum, sp. n., Jourdain, (16) p. 1513.

Herdman (13) gives a preliminary list of the species of Compound Ascidians collected during the 'Porcupine' and 'Lightning' expeditions.

THALIACEA.

Seeliger (23) discusses the relations between the life-histories of the various *Thaliacea*, and also considers their probable phylogenetic relation to the other *Tunicata*. He regards the *Thaliacea* as having diverged at an early period from the Ascidians, but he places the *Pyrosomatidæ* as an offshoot on the branch leading to the *Salpidæ*.

Barrois (1), in discussing the life-history and the process of gemmation in *Anchinia*, points out certain features in which that form approaches the *Appendicularüidæ*, especially (1) the primitive condition of

the atrial cavity, with its two short tubes opening into the bran[illegible]; (2) the presence of a neural tube running along the whole length of the body, and having cephalic and visceral terminal enlargements corresponding to the cephalic and caudal ganglia of *Appendicularia*; and (3) the position of the anal aperture on the surface of the body. He points out the similarity between the life-history of *Anchinia*, so far as it is known (the asexual form, or "Nurse," has not yet been observed), and that of *Doliolum*. In both cases the sexual generation is polymorphous, and has three forms, two of which remain in a rudimentary condition, so far as the reproductive organs are concerned. In the case of *Anchinia*, however, the three forms are not found together on one stolon or outgrowth, as in *Doliolum*, but are produced successively; and, moreover, in *Anchinia* the reproductive zooids of the sexual generation are not borne by the second form of sterile zooids (the foster-zooids), but are produced independently.

Herdman (9) gives an account of the structure of the sexual generation of a species of *Doliolum* (*D. denticulatum* ?) found in large numbers in the North Atlantic during the cruise of the 'Triton' in 1882.

Traustedt (26) discusses the *Salpidæ*, giving a synopsis of the family, and describing fully the solitary and the aggregated forms of 11 species and 1 new variety (*Salpa democratica-mucronata* var. *flagellifera*), with a detailed synonymy.

MOLLUSCA.

BY

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List of Publications.

1. Adami, G. B. Novità malacologiche recenti. Bull. Soc. mal. Ital. xi. pp. 204–208.

1a. Adams, L. E. The Collector's Manual of British Land and Freshwater Shells, containing figures and descriptions of every species. London: 1884, 8vo, 122 pp., 8 pls.

2. Albini, G. Sui movimenti dei cromatofori nei Cefalopodi. Rend. Acc. Nap. xxiv. pp. 121–124.

3. Am Stein, J. G. Die Mollusken Graubündens (continued). JB. Ges. Graub. (Beilage), pp. 65–108 (also separately, Chur, 1885).

4. °Ancey, C. F. Sur divers Mollusques de l'Empire Chinois. Bull. Soc. mal. Fr. ii. pp. 113-137.

5. °——. Sur différentes espèces africaines. *T. c.* pp. 137–146.

6. °——. Observations critiques sur "la Faune Malacologique des îles de Socotra et d'Abd-el-Goury" de M. Crosse. *T. c.* pp. 147–156.

7. Ashford, C. Note on the Anatomy of *Helix sericea*, Müll. J. of Conch. iv. p. 259, pl. x. fig. 5.

8. ——. The Darts of British *Helicidæ*. vii. *T. c.* pp. 267–270, pl. x.

9. °Aurivillius, C. W. S. Öfversigt över de af Vega-Expeditionen insamlade Arktiska Hafmollusken. ii. *Placophora* och *Gastropoda*. Vega-Exped. Vetensk. Jaktt. iv. pp. 313–383, pls. xii. & xiii.

10. °Bakowski, J. Mieczaki galicyiskie (*Mollusca* of Galicia). Kosmos (Lemberg) 1884, ix. pp. 190–197, 275–283, 376–391, 477–491, 604–611, 680–697, & 761–789.

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12. Barfurth, D. Vergleichend-histochemische Untersuchung[illegible] das Glycogen. Arch. mikr. Anat. xxv. pp. 259–404, pls. xv.–xvi[illegible] see also SB. Ver. Rheinl. xlii. pp. 371–376.

13. °Barrois, T. Les glandes du pied et les pores aquifères chez les Lamellibranches. Lille : 1885, 4to, 169 pp., 9 pls.

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15. Bergh, R. Ueber die Verwandtschaftsbeziehungen der Onchidien. Morph. JB. x. pp. 172–181. See also Ann. N. H. (5) xiv. pp. 259–266; Arch. Z. expér. (2) iii. pp. viii.–xi.; J. R. Micr. Soc. (2) iv. p. 870.

16. ——. Beiträge zur Kenntniss der Aeolidiaden. viii. Verh. z.-b. Wien, xxxv. pp. 1–60, pls. i.–vii.

17. ——. Notes on the *Nudibranchiata*. Chall. Nar. i. pp. 693 & 695, figs. 237 & 238.

18. °Berthier, H. Description du *Meladomus letourneuxi* d'Egypte. Bull. Soc. mal. Fr. ii. pp. 101 & 102.

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21. °Binney, W. G. A Manual of American Land Shells. Washington : 8vo, 528 pp., with figs.

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25. Boas, J. E. V. Vorläufige Mittheilung über einigen gymnosomen Pteropoden (*Spongiobranchæa*, D'Orb., *Dexiobranchæa*, g. n., *Cliopsis*, Tr.). Zool. Anz. viii. pp. 687–691; abstr. J. R. Micr. Soc. (2) vi. p. 228.

26. Bœttger, O. Beitrag zur Kenntniss der Schnecken-fauna von Central-Bosnien, sowie des südlichsten Dalmatiens und Westmontenegros. JB. mal. Ges. xii. pp. 53–71.

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45. BOUTAN, L. Sur le système nerveux d'une Fissurelle (*F. alternata*). C.R. c. pp. 467–469 ; abstr. J. R. Micr. Soc. (2) v. p. 624.

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374. Watson, R. B. On the *Cerithiopsides* from the Eastern Side of the North Atlantic, with Three New Species from Madeira. J. L. S. xix. pp. 89–95, pl. iv.

375. ——. Notes on the *Gastropoda* in Chall. Nar. i. pp. 894–897, fig. 328.

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377. Westerlund, C. A. Fauna der in der paläarktischen Region lebenden Binnenconchylien. v. *Succinidæ*, *Auriculidæ*, *Limnæidæ*, *Cyclostomidæ*, and *Hydrocenidæ*. Lund : 8vo, 135 pp.; Beilage zu Heft iv., 8 pp.

378. Willcox, J. Spawning of *Fulgur perversus*. P. Ac. Philad. 1885, pp. 119 & 120; abstr. J. R. Micr. Soc. (2) v. p. 986.

379. Winslow, F. Notes upon Oyster Experiments in 1883. Bull. U. S. Fish Comm. iv. pp. 354–356.

380. Woodward, B. B. On some Variations in *Helix arbustorum*, Linn. Zool. (3) ix. pp. 408–414.

381. Woodward, H. On Recent and Fossil *Pleurotomariæ*. Geol. Mag. (3) ii. pp. 433–439, pl. xi.

382. Wright, R. R. On a Parasitic Copepod of the Clam. Am. Nat. xix. pp. 118–124, pl. iii.

383. Ziegler, H. E. Die Entwickelung von *Cyclas cornea*, Lam. (*Sphærium corneum*, L.). Z. wiss. Zool. xli. pp. 525–569, pls. xxvii. & xxviii. Prelim. notice, Zool. Anz. vii. (1884) pp. 595–598; abstr. J. R. Micr. Soc. (2) v. p. 625.

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Annales [et Bulletin] de la société malacologique de Belgique, xix. (series 3, vol. iv.), année 1884 (1885). Brussels: 8vo, pp. 136 & cxxxiv., spring 1, Varig[illegible]nap.

(*Cephal[illegible]*) verbaux des séances de la société royale malacologique de 2, no[illegible], 3e, xiv. pp. i.–cxli. Brussels: 1885, 8vo.

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*Bulletin de la Société malacologique de France, ii. Paris : 8vo.

P. Fischer's Manual de Conchyliologie (123) is continued, and has reached the conclusion of the *Scaphopoda* at the 896th page; two more parts, to be published in 1886 and 1887, will complete the work.

Martini & Chemnitz's Systematisches Conchylien-Cabinet, edited by

Kobelt & Weinkauff, has reached its 337th fasciculo. For particulars see Dohrn (106), Clessin (76), Löbbecke (233), and Weinkauff (376).

Tryon has completed vol. vii. of his Manual of Conchology, and has commenced the issue of a second series, treating of the *Pulmonata*, of which vol. i. has been published [see (358)].

Kobelt (210) commences a second edition of Rossmässler's "Iconographie." The first two parts treat of the Palæarctic *Unionidæ*; three spp. nn. are described, and many figured for the first time.

Adams (1A) has issued a neat handbook of British Land and Fresh-Water *Mollusca*.

Clessin's second edition of his "Deutsche Excursions-Mollusken-Fauna" is completed (78).

Nevill (277) continues his catalogue, and ends it, so far as his own personal work is concerned, with vol. ii., which treats of the *Taenioglossa* (Families *Ampullariidæ* to *Melaniidæ*). The species enumerated are, of course, mainly Indian, but the Museum contains also a good many from other localities.

Kobelt & Spengel give an account of the literature on *Mollusca* during 1884, in Zoologische Jahresbericht, part iii., 123 pp. Berlin: 8vo.

E. von Martens gives an account of that during the year 1883. Arch. f. Nat. l. 2, pp. 522–614.

Anatomy and Physiology.

Phylogeny of the *Mollusca* as a whole is briefly treated by Herdman, (166) pp. 27–39, based mainly on Lankester; also some remarks by Sedgwick, Q. J. Micr. Sci. (2) xxiv. p. 71.

Wagner (373) gives a detailed account of the anatomy, physiology, and habits of *Clio borealis* (see also pp. 39 & 44).

Vayssière (364) has examined 37 species of *Tectibranchiata*, and finds them all Opisthobranchiate; he follows Fischer in dividing them into *Cephalaspidea* (20 spp.), *Anaspidea* (6 spp.), and *Notaspidea* (9 spp.).

Notarchus possesses a minute shell, situated in the integuments near the anus; the lateral portions of the foot pass upwards, and fuse throughout almost their whole length in the middle line of the back. *Oscanius*, Leach, with amended characters, is used for *Pleurobranchus membranaceus* and *P. tuberculatus*, in which the generative openings are completely separate, the vulva somewhat anteriorly to and above the branchia, the penis nearer the head and protected by strong folds of th[illegible] margin.

Pleurobranchæa has no shell, so far as the author could observe, [illegible] may possess a microscopic one, like *Notarchus*. In *Umbrella mediterranea* there is a very delicate subœsophageal commissure: the otocysts are difficult to find; they lie upon the pedal ganglia, and are connected with the cerebral ganglia by a very slender connective; the otoliths are very numerous (150–200); nervous system of *Tylodina* resembles that of *Umbrella*, but three visceral ganglia are present: eggs are contained in a yellowish nidimental ribbon, and the embryo possesses a nautiloid shell.

[illegible]UROTH (336) has given a detailed account of the anatomy of the various German slugs, the systematic conclusions based upon which will be found abstracted on p. 66.

JOURDAIN (205) considers that the species of *Limacidæ* should be determined by the internal anatomy (especially of the generative organs), rather than by such variable characters as the colour, form of the shell and jaws, &c. An excretory canal runs through the pedal gland for a variable distance in the middle line; it is lined with cilia, and opens at the bottom of a transverse groove, which separates the buccal papilla from the anterior border of the foot. In the *Limacidæ* it is branched and glandular. The author reduces the species of St. Vaast to 5: *Arion rufus*, *Limax agrestis*, *L. maximus*, *L. variegatus*, *Milax gagates*. Of these he gives diagnoses, based mainly on characters hitherto neglected.

LACAZE-DUTHIERS (225) gives a morphological comparison between *Testacella* and *Limax*, the homologies being based upon the nerve supply. In *Testacella*, the mantle and respiratory cavity have become inferior and diminished in size, and the viscera, not finding space below them, have passed into the neck; whilst in *Limax*, the foot has developed into a large sac, containing the viscera. *Testacella* may have been developed from *Limax* by adaptation to subterranean existence.

The same author (222) corrects some mistakes of Dall regarding the structure of *Gadinia garnotii*, the pulmonary sac of which is a kidney, and encloses water, but is not specially vascular. Respiration is probably carried on by the margin of the mantle surrounding the border of the shell.

GIBSON (137) gives an account of the anatomy of *Patella vulgata*. Epithelial cells elongated, connected with subepithelial connective tissue; not absent between the circular muscle and the shell; they are modified to form an eye at the base of the tentacle; the cells are pigmented, and the cuticle forms a double layer; the muscle fasciculi are so disposed as to create a vacuum under the foot, by which the animal is attached; the fibres are non-striated, save in the heart. Gills are morphologically processes of the ventral surface of the mantle. Tactile papillæ occur in pockets along the edge of the mantle skin; the structure and behaviour towards reagents of the right and left kidneys are different. Blood corpuscles are colourless and amœboid. The author describes the alimentary canal, and finds a hard plate in the floor of the buccal cavity, hitherto overlooked, against which the radula plays. The microscopic structure of the various parts is given. Nervous system consists of eight pairs of spring [illegible] the three primary being much the largest; the fibres are elongVARIcated cells; ganglia consist of neuroglia, with many triangular (*Cephal*ular nerve cells; in the pedal and visceral ganglia are many bipolar cells. The conclusions of Braudt & Spengel are confirmed. The histology of the reproductive organs is given, and the author agrees with Cunningham that the reproductive organs have no ducts.

LACAZE-DUTHIERS (223) replies to criticisms of Spengel regarding his views on the epipodium of *Haliotis*, and fortifies his position by arguments drawn from *Trochus*, *Fissurella*, and *Emarginula*.

A female of *Halia priamus* (Risso) from the mouth of the Gambia has been examined by POIRIER (294, 295). The foot is large, and resembles

that of *Buccinum undatum*, except that it has no operculum ; the he[ad] well-developed, slightly flattened tentacles, the left being the larger. The formula of the radula is 1, 1, 1. The centres of the nervous system are very condensed ; the branchial is further removed from the cerebral than in *Buccinum* ; which, however, it resembles in being chiastoneural and not orthoneural, as stated by von Jhering. The author is disposed to place this animal, in spite of the lack of an operculum, among the *Buccinidæ*.

The epidermis of *Dentalium* is a simple epithelium ; at the two ends of the mantle unicellular glands are found in it, which secrete the shell. The nerve-ganglia are composed of a grey cortical and white medullary substance; the former consists of unipolar cells, the latter of fibres without neuroglia. The muscles are composed of smooth fibres, disposed like those of *Vertebrata*, but having a denticulate appearance, due to trabeculæ of protoplasmic substance which connect each fibre with its neighbour. An elongated nucleus may be found in each fibre. There are two layers of circular muscles in the foot, surrounding longitudinal bundles, with transverse bundles crossing a large sinus in the axis of the foot. The buccal tentacles are hollow, and communicate with the vascular system, but not with the exterior. The alimentary canal is lined by epithelium of varying character, cylindrical or glandular. The liver and kidneys are digitate hollows, lined with epithelium; the two halves of the kidney are connected by a common median pouch below the anus, and open externally by the aperture described by Lacaze-Duthiers ; no internal opening was seen. The blood-sinus has a pair of openings to the exterior, with sphincter muscles. On the surface of the ovary there are young ovules, the greater part of which is occupied by the nucleus. These enclose a double nucleolus which disappears in the mature ova. The efferent genital canal described by Lacaze-Duthiers was not seen, and it appears most likely that the products are discharged by dehiscence through the anal gland, or perhaps by way of the pallial cavity or kidney ; Fol (130).

Leydig (232) refers the presence of pores in the calcareous tissues and muscles of *Ancylus* to physical forces, and not to the vital action of the cells. The direct division of the nucleus by constriction seems to be the most usual. Red colour of œsophageal cartilages apparently connected with subaqueous existence. *Ancylus* has upon the head, and especially on the tentacles, stiff bristles, resting on special bases. The author is convinced of the existence of intercellular spaces in normal tissues, but does not [find] in a water-vascular apart from the blood-vascular system. The [nervous] elements exhibit a differentiation into cortical and medullary sub[stance].

See also Bergh (15, 16) ; and Fischer (125, 126).

1. *Shell, Integument, and Connective Tissue.*

Gümbel (150) has investigated the resistent powers of various portions of shells by placing them in water through which carbonic acid gas was passed for some weeks. Under these circumstances the compact parts were dissolved more rapidly than those less closely aggregated. This

...es with the fact observed by geologists that the outer layer of shells is better preserved than the nacreous, and this than the fibrillar, so-called "ivory" layer.

MÜLLER (275) shows that the shell of the Lamellibranchs is not merely a secretory product, but is alive and grows by intussusception. Its outermost margin, and the surface turned towards the mantle, always remain soft. The calcification takes place by small, round, irregular structures, which afterwards become prismatic by mutual pressure; the lamellar structure is a secondary modification. The organic substance of the shells originates in the cells, not, as Nathusius asserts, independently of them. The fibrillæ of the shell follow in their development the direction of action of the muscles, which are developed along with them. The shell is opened by transverse muscular fibres, not simply by the elasticity of the ligament; this action is also assisted by the radial muscles in the dorsal aspect of the animal. The transverse muscles of the mantle draw the soft margins of the shell against each other, and thus secure its complete closure. Shells are divided into—(1) Those connected with the mantle only at isolated places; most belong to this class. Organic substance of nacreous layer membranous. (2) Those connected over the whole mantle. Organic substance of nacreous layer, finely reticulate. Only in *Cyclas*.

According to KRUKENBERG (219, 220) chitin occurs in *Sepiola rondeleti* only in the jaws, the chief part of which it also composes in *Octopus*, *Eledone*, *Sepia*, and *Loligo*. In *Spirula peronii* it is found chiefly in the septa of the shell; in *Argonauta* the shell is mainly albuminoid. *Nautilus* contains chitin in some quantities, but not distributed as in *Spirula*. The same author also gives an account of the composition of the shell, and other skeletal structures (218).

Cartilage of *Sepia* contains chitin; HALLIBURTON (158, 159).

Chromatophores, effects of mechanical stimulation upon, observed by ALBINI (2).

2. *Muscular System.*

PAWLOW (284) has examined the action of the adductor muscle of *Anodonta cygnæa*. Two kinds of nerves are present: motor, producing contractions, and inhibitory, producing relaxation. The motor nerves for each muscle spring from the ganglia next it. All the inhibitory fibres spring from the two anterior ganglia.

VARIGNY (362) finds that the unstriated muscles of most invertebrates (*Cephalopoda* in particular) are:—1, under the influence of the will; 2, not necessarily "thermosystaltic"; 3, not invariably less irritable than striated muscles; 4, sometimes very rapid in contraction and relaxation; 5, of variable latent period. This last is shown by the same author (363) to be $\frac{15}{10}$ sec. in *Scaphander lignarius*, $1\frac{25}{10}$ sec. in *Sepia officinalis*; it varies with the intensity of the exciting current, with the mode of excitation, with the weight to be lifted, and with other conditions.

The adductor muscles of *Anodonta* retain their contractility for days when kept in the blood; numerous facts regarding amount and energy of contraction: BIEDERMANN (19).

The "flesh" of marine Gastropods contains 1·13–1·95 per cent. soluble salts; FREDERICQ, CB. med. Wiss. xxiii. p. 430.

NIEMIEC (278), in the course of an elaborate anatomical examination of the suckers of the animal kingdom, describes those of the following types of *Mollusca*:—*Pterotrachæa coronata* has a bell-shaped sucker between the two portions of the fin, consisting of an acetabular portion proper, and an envelope; the former contains (1) radial, (2) annular, (3) meridional muscles. The first enlarge the cavity of the sucker; the second, in the main, contract it, those of the extreme margin causing its retraction; while the last group either enlarge the cavity, retract the margin, or press it against the surface of attachment, according to the point of their insertion.

In *Pneumodermon mediterraneum* the structure of the sucker resembles, on the whole, that of *Pterotrachæa*, but the structure of the peduncle is more complicated, and there is a cuticular layer developed upon the margin of the suctorial face, which is perforated by the ducts of minute glands. The Octopod sucker has been studied chiefly in *Argonauta*, where it is provided with both intrinsic and extrinsic muscles; the former consist of (1) a radial system, perpendicular to the epithelium, both of the acetabular chamber and the infundibulum; (2) circular fibres situated beneath the epithelium, and forming a sphincter, which separates these two cavities; and (3) a stellate system which sends out meridional fibres towards the sphincter. The extrinsic muscles consist of six groups. The author discusses the actions of these muscles, and arrives at results which are, in some points, at variance with those of Girod. In the groove which runs round the margin of the sucker are certain large pointed cells, with a thickened cuticle, and the epithelium covering the interior of the sucker is of the columnar type.

The suckers of the *Decapoda* are illustrated, in the first instance, by those of *Sepiola rondeleti*, which presents for consideration (1) the basal part embedded in the arm; (2) the peduncle; (3) the sucker proper. The first contains longitudinal, circular, and radial muscles, the two former of which are continued into the peduncle. At the point where this enters the sucker is a ganglion. The epithelium is covered by a thin cuticle, which takes the form of various horny growths:—(1) The ring with its marginal teeth; (2) the rods disposed around the edge of the suctorial surface; (3) the spoon-shaped processes immediately surrounding the aperture of the sucker. In the tentacular suckers the musculature is less powerful than in those of the arms, and the floor forms a thin layer, not a solid piston. In the remainder of this section of the paper, the different elements of the sucker are treated in succession, and their homology and functions pointed out, and the various forms of suckers and hooks are shown to be modifications of a common type.

3. *Digestive System.*

The alimentary canal of *Fissurella* resembles in general that of *Haliotis*; there are, however, only two radular cartilages instead of four; only two œsophageal pouches are present, which are of such delicate structure

their function is probably merely digestive. The liver is formed of two lobes united on the ventral face of the stomach; the salivary glands are in the form of arborescent tubes, and in the mouth there is a pair of small bodies, which seem to represent two others. The organ of Bojanus consists of two unequal lobes, the right being the larger. It opens in common with the genital glands at the right side of the anus. The female reproductive gland is in the form of a crescent; its upper surface is intimately connected with the liver, and rests laterally on the foot and epipodium. *Fissurella reticulata* deposits its eggs on flat stones in a single layer, by the aid of undulatory movements of the foot. Boutan (47).

Bourquelot (43) has examined the digestion of *Cephalopoda*, and finds that the liver and the organ called "pancreas" are digestive, but not the salivary glands, spiral intestine, or intestinal canal. The liver secretion contains diastase, trypsin, and pepsin; the pancreas diastase, identical with that of the higher animals and of malt; the trypsin is used in the digestion of proteids, which resembles in all points the pancreatic digestion of higher animals. The process takes place in the stomach, and the matters do not pass into the cæcum owing to the presence of a valve. That the liver contains no pepsin cannot be regarded as decided, although it is said that this and trypsin cannot exist in the same fluid. Fats are emulsionised in the stomach. The liver contains glycogen, mucin, leucin, and tyrosin, but no bile acids nor bile salts. Griffiths (148) has found leucin, tyrosin, and a diastatic ferment in the liver of *Sepia*, and also, though not constantly, "albumen in pseudo-crystalline aggregations." See also * Chem. News, xlviii. p. 37, li. p. 241; J. Chem. Soc. xlvi. p. 94, 1884; and abstr. J. R. Micr. Soc. (2) v. p. 622.

Dybowski (115) has investigated the masticatory apparatus of *Paludina vivipara* and *Limnæus stagnalis*. The lingual cartilages are two, which overlap by a thin margin in the middle line; their tissue is entirely cellular, with no intercellular matrix, and comparable to the embryonic cartilage of higher animals. The jaws consist of: (1) muscles, mostly longitudinal; (2) cellular tissue, supporting the jaw proper; and (3) the epithelium, which secretes a thick cuticle and a prismatic rod-layer, the true masticatory portion. The differences between the two forms investigated are indicated.

The same author (112) has studied the dentition of *Limnæus stagnalis* var. *vulgaris*, which he considers a fifth type of fresh-water *Pulmonata*. The formula is 1-19-15-15; there are from 100 to 102 rows. He finds also that in *Planorbis marginatus* the median and outer teeth resemble those of *Choanomphalus* rather than of the *Limnæidæ* (114B); and further describes the buccal organs of *Physa fontinalis* (113).

Rössler (315) has investigated the formation of the radula in various groups of Mollusks. The radula-sheath is a diverticulum of the buccal epithelium. The evaginated epithelium is in the form of a groove, filled with a plug of connective tissue. At the extreme end of the diverticulum is a group of specially developed epithelial cells, which secrete the teeth and the basement membrane. These are either a few large cells, with large nucleus and clear protoplasm (*Pulmonata*, *Opisthobranchiata*),

or a larger number of smaller ones, only distinguished by their great length from the rest of the epithelium. During the formation of a tooth the odontoblasts are not replaced by new ones from behind, but the same group develops all the teeth of the same longitudinal series. The arrangement of the groups of odontoblasts varies with that of the teeth in a transverse row of the radula. The basal membrane, which is distinctly laminated, is formed by the ends of the matrix cells splitting into longitudinal fibres, which are placed side by side. The teeth become stronger by a secretion from the cells situated above the radula.

Von Jhering (201) proposes the names "Basalplatte," "Epithema," and "Dentikel" for the base of attachment, reflection, and cutting-points of the teeth of the Gastropod radula; also, to write the number of denticles in each tooth below the number of teeth in the formula; and, further, to indicate the three parts by different colours in drawings.

Jousseaume (206) upholds the opinion that the radula is only to be used for classificatory purposes with caution, and in connection with the other organs of the body.

Schacko (321) describes the buccal armature of five *Helicidæ*.

4. *Circulatory System.*

Remarks on blood of *Helix pomatia*, *H. aspersa*, *Limnæus stagnalis*, *Paludina vivipara*, *Anodonta cygnea*; MacMunn (244). The same author gives particulars regarding the existence of myohæmatin and histohæmatin in certain Mollusks, with an account of their spectra (243).

The influence of electric currents and poisons upon the hearts of *Octopus*, *Pterotrachea*, *Aplysia*, and *Helix* has been investigated by Ransom (305).

The inception of water by Lamellibranchs is exhaustively treated by Fleischmann (129). Muscles pass both from the right and left sides of the body towards the margin of the shell, and these eventually unite, and form a complicated interlacing with each other, and for this covering of the viscera the name "Muskelhaube" (muscle-hood) is proposed. When the foot of *Anodon* or *Cyclas* is extended, waves are seen passing along it from behind forwards as though of fluid passing through a hollow elastic-walled body. Earlier observers had seen that when a muscle is removed from the water, jets of this are seen to issue from what, under a lens, appear to be apertures in it. The author has made serial sections of animals carefully killed in picro-sulphuric acid and corrosive sublimate, and finds no such pores.

Griesbach probably was deceived by the single layer of epithelium, which in some places forms the only boundary between the exterior and the "pedal artery," having been broken through, a result to which his modes of preservation were not unlikely to lead. The author took Anodons, and while the foot was extended pressed the valves together so that it could not retract, and then killed the animal by immersion in hot corrosive sublimate solution. By this means the pori should be preserved, but none were found. As regards injections, the author points out the illegality of many of the methods of Griesbach, and especially of the

direct injection," which, if it proved anything, would show that the foot is covered all over with pori. The experiment of placing mussels in water containing finely-divided colouring matter gave a negative result.

The streams of water which issue from the foot when the *Anodon* is removed from the water arise from its bursting, owing to the blood contained in the organ being unable to escape by the normal channels. The author then proceeds to discuss mechanical difficulties in the way of the entrance of water through the supposed pores, either in a distended or contracted state of the foot, devoting some time to a discussion of Sabatier's statements regarding *Mytilus edulis*. Bivalves have not great need of oxygen. Injection has long since shown that the arteries were competent fully to distend the foot, if only there were sufficient blood in the body for the purpose. Fleischmann shows that about 50 per cent. of the weight of an *Anodon* is blood, which is quite sufficient for this purpose. When the foot is retracted the "muscle-hood" is comparatively thin, and its fibres closely packed, while the visceral cavity is widely distended; on protrusion of the foot these conditions are reversed. The blood used in distending the foot is contained in the mantle, which holds about half the total quantity of blood in the body. "Keber's valve," between the veins of the foot and of the kidney, is the means by which a congestion in the former organ is rendered possible, and details are also given as to the mode by which the circulation is carried on during its turgescence. Arguments are also adduced against the possibility of an influx of water through the organ of Bojanus and through the intercellular passages.

Griesbach (147) replies, upholding the existence of pori aquiferi. See also a remark by Carrière, Arch. mikr. Anat. xxiv. p. 37, footnote.

A discussion of this question, with arguments based mainly upon injections and subsequent cutting into series of sections, is given by Kollmann (214).

Bourne (42) denies the existence of the communication between the vascular system and exterior said by Lacaze-Duthiers to exist in *Pleurobranchus*.

5. *Respiratory System.*

Respiration of *Pulmonata* in deep water discussed by Forel, (133) p. 196.

Vayssière (365) describes in great detail the anatomy of *Truncatella truncatula*, especially the respiratory apparatus, which is shown to consist of a gill placed transversely in a respiratory cavity.

Joubin (203) traces the development of the branchia in *Sepia* from an elongated papilla, not ciliated like the mantle-cavity, which becomes divided by transverse grooves into a number of laminæ, each of which becomes folded in its turn, an afferent vessel passing to the elevated and depressed portions of each fold. The vessels arise in the midst of masses of cells, and have proper membranous walls; they are connected by intercellular lacunar spaces. The branchial gland is formed along the internal margin of the gill from cells which have not taken part in the formation of the lamellæ, but which form a spongy tissue. Muscular fibres pass

along the border of the gill, and also along each lamina. In the ac... foramen is seen between the bases of each pair of gill laminæ, small in *Sepia*, but large in *Ommastrephes*, and still larger in the Octopods, forming a canal through which passes the current of water. In *Sepia* each lamina is triangular, the angles at the base being occupied by the main efferent and afferent vessels; the latter gives off two branches to each lamina, one much smaller than the other, this inequality being less in *Ommastrephes*; the minute branches in the folded laminæ are so disposed that the afferent vessels occupy the highest and lowest points of the folds, while the corresponding efferent vessels lie between them. The surface occupied by these lamellæ is calculated at 900 sq. cm. for each gill. A system for the nourishment of the gill itself is formed by a small vessel given off by the afferent vessel at the base of each lamina, the blood being collected into a vein which runs down the gill parallel to the afferent vessel. Furthermore, a connection takes place between the extremities of these nutrient vessels and those of the veins from the branchial gland. This latter is compared with a spleen, as it has no duct and receives blood which has circulated in another organ (the gill). The branchia of the adult Octopods (*Octopus*, *Eledone*, *Argonauta*) is described in some detail, and compared with that of the Decapods.

6. *Excretory and Secretory Systems.*

Girod's paper on the ink-bag of Cephalopods abstracted; Ann. Soc. mal. Belg. xix. pp. xi.–xiii. [see Zool. Rec. xix. *Moll.* p. 15].

Hammarsten (Arch. ges. Phys. xxxvi. pp. 384–456) finds that the mantle of *Helix pomatia* excretes mucin, as also does the foot. The liver contains 1·75 per cent. of ordinary glycogen; in animals which had hibernated in a warm room the liver contained 0·429 per cent. of glycogen.

Barfurth (12) has investigated the presence of glycogen in *Helix*, *Limax*, *Arion*, and *Cyclostoma*, where he found it in most of the organs. The quantity in the muscles is inversely proportional to their activity; the plasma-cells of Brock contain it in the greatest abundance. Three weeks' fasting causes it to disappear from the liver, but it reappears nine or ten hours after feeding. Claude Bernard's division of the Gastropod liver into a bile- and a glycogen-forming organ must be abandoned; physiologically as well as developmentally it is a part of the gut. Glycogen is formed in the salivary glands only some time after feeding, disappearing shortly. In *Helix* no cilia were found in the salivary ducts. Hepatic epithelium consists of liver-, ferment-, and calcareous-cells.

Glycogen has been found by Blundstone (24) in large vesicular cells in the mantle of *Anodon* and the mesentery of *Helix*.

According to Schüler (329), the spaces in the foot of *Anodonta* are not lacunæ, but cells with clear mucoid contents.

Action of Molluscan kidney discussed by Landsberg (228), who comes to the conclusion that the "canal between the pericardium and kidney serves only to transmit from the former to the latter the fluids which have been expressed through the cardiac walls."

Haller (156) gives a detailed account of the kidney of *Fissurella*,

...otis, and certain *Trochidæ* and *Muricidæ*, and comes to the conclusion that the first is derived from *Chiton*, in regard to which he recognizes the accuracy of Sedgwick's opinion that the renal infundibula open into the pericardium. The arrangement in *Haliotis* approaches that in *Fissurella*, but in some respects resembles the *Trochidæ*. Comparisons with the *Opisthobranchiata* are also given. *Bornella* has an acinous kidney; the sac of *Phylliroë* is a secondary modification.

The renal organ of certain species of *Parmacellæ* has been investigated, some errors previously made in its description corrected; a "Nierenspritze" is described as leading from the pericardium into the kidney; also remarks on other organs; SIMROTH (339).

The so-called "liver" of *Mollusca* consists, according to FRENZEL (134A), of three kinds of cells: (*a*) granular; (*b*) club-shaped, secretory cells; (*c*) so-called calcareous cells. In Lamellibranchs these last are absent, and sometimes the second; in *Chiton* and *Patella* the club-cells are wanting; whilst in the *Heteropoda*, so far as examined, only the granular cells are certainly present. *Pulmonata* and *Opisthobranchiata* agree in the first two kinds being present; in Pteropods the calcareous cells are certainly, and the club-shaped probably, absent. *Cephalopoda* have no granular cells, but their club-cells contain either vacuoles or yellowish-brown masses enclosing colourless crystals; the calcareous cells contain spheroidal bodies.

In *Cardium edule* the byssogenous apparatus consists of five parts: (1) a groove on the inferior aspect of the foot; (2) glands on the margins of the groove; (3) a canal which penetrates the foot from the posterior end of the groove and opens into a cavity ("byssal cavity"); (4) this cavity possesses lamellar walls, to which the commencement of the byssus is attached; (5) glands united into a compact mass, which pour their secretions into the byssal cavity. 50 species were examined, showing the apparatus more or less completely developed, except *Pholas*, *Solen*, *Lucina*, *Diplodonta*, in which it was entirely absent. The openings of these glands are the only pores to be found in the foot. BARROIS (13, 14).

Formation and minute structure of the byssus of Lamellibranchs discussed by CATTIE (70).

See also BREITENBACH (52); and HADDON (153).

7. *Nervous System.*

VIALLETON (371) regards the dotted substance of the Cephalopod nerve-centres as corresponding with the neuroglia of Vertebrates; it arises in the embryo as a plexus of fibrils. In the visceral ganglia the same continuity of cells and axis-cylinders as in Vertebrates may be observed; the differentiation of nervous tissue is more completely carried out in the Vertebrates than in the *Cephalopoda*. The same author (369) finds that the nerves supplying the lobes of the buccal membrane in *Cephalopoda* are similar in origin to those supplying the arms, and hence considers that the former are to be regarded as small arms with a well-developed interbrachial membrane.

HALLER (157) gives a detailed histological account of the nervous system of the marine *Rhipidoglossa*. The ganglionic cells have processes of three kinds: "connecting process," uniting two cells directly; "plexiform process," breaking up in the central nervous system; "trunk process," directly continuous with a nerve-fibre. Large triangular ganglionic cells are best seen in *Haliotidæ* and *Trochidæ*, two upper processes of which are always connected with smaller cortical cells, the lower being a plexiform or trunk process. There are, in addition, "central" cells with no processes. No giant-cells, like those of *Pulmonata* and *Opisthobranchiata*, are present. The nucleus is always rounded, never reniform as in *Pulmonata*. The ganglion-cells of the central system have a thin coating of connective tissue, and between the protoplasmic particles is a yellowish pigment soluble in alcohol. The nervous investment is a continuation of the neurilemma, and is continuous over the whole central system. The connective tissue presents variations in one and the same species, a fact in accordance with Brock's views as to its variability in *Mollusca*. The nuclear portion of the central nervous system is a very delicate plexus, and neither dotted substance nor neuroglia. The pedal cord has a groove which is constant, but of no morphological significance; the cords consist of two layers. The central ganglia have undergone concentration in *Fissurella*, but not in most *Rhipidoglossa*. The large pyriform and triangular cells are absent. The central nervous system and peripheral ganglia consist in general of marginal cells and a central plexus, formed from the processes of the cells and not from the neurilemma. Peripheral nerves arise from the cells and from the nerve plexus.

The nervous system of *Fissurella* consists of two cerebral and two pedal ganglia and an "asymmetric centre" composed of five ganglia. In addition there is a triangular mass, which is probably a prolongation of the pedal ganglia and the two first of the asymmetric system. *Parmophorus* furnishes a connecting link between *Haliotis* and *Fissurella*; whilst *Emarginula* might be placed between the last and *Parmophorus*. BOUTAN (45).

The nervous system of *Tethys leporina* has been dissected by LACAZE-DUTHIERS (226). It consists of the three groups of ganglia usual in Gastropods; the nervous cells are contained in pyriform sacs, so that the ganglia have a racemose appearance, but after maceration six secondary groups may be distinguished, and the triangular arrangement of three ganglia on either side may also be made out, although the connectives are extremely short. A careful investigation further reveals the asymmetric system in its normal connections.

JOURDAIN (204) finds that, whilst in the adult *Limacina* there is a great concentration of the post-œsophageal nerve-masses, in the embryos they are but slightly developed, and connected by a long transverse commissure. The author differs from Lacaze-Duthiers, as he does not find that the otocyst is always primitively connected with the cerebral ganglia. The auditory nerve takes origin from a small ganglion situated on the connective between the post-œsophageal and pedal ganglia, but afterwards becomes connected with the pedal ganglia. The otocyst is not regarded as an organ for the perception of sound, but of disturbances

...e substance to which the foot is applied or in the surrounding water.

The nervous system of *Ancylus fluviatilis* differs from that of *Gadinia*, inasmuch as the œsophageal collar is very small and the buccal mass does not pass through it. The cerebral ganglia are pear-shaped, bifurcated above, the outer prominence giving rise to the ocular, tentacular, and lateral cephalic nerves; the inner dividing into branches for the lips, skin of the head, and the penis. The "asymmetric centre" consists of four ganglia, three of which belong to one side, one to the other; it innervates the mantle, reproductive organs, branchial lamella, and heart. The otocysts are easily found on the dorsal aspect of the pedal ganglia. LACAZE-DUTHIERS (224).

The nervous system of *Gadinia garnotii* consists of six ganglia, which are united to form two œsophageal collars, in addition to which there is a third, composed of an uneven number of ganglia, correlated with the asymmetry of the animal. The otocysts are seen by removing the pedal ganglia, and placing them under the microscope; the auditory nerve follows the usual rule of arising from the cerebral ganglia. The reproductive system is hermaphrodite; the apertures are separated by the right eye, but are very small; LACAZE-DUTHIERS (222A).

BOUVIER (48) has examined the nervous system of *Buccinum undatum*, and finds two groups of ganglia united by a long visceral commissure. The anterior group is almost hidden in the salivary glands, and consists of 2 cerebral, 2 pedal, 2 commissural, 1 subintestinal, 2 sympathetic ganglia. The posterior contains only two ganglia on the visceral commissure. Each cerebral ganglion has three sensory nerves—tentacular, optic, and auditory, and also a nuchal arising from the cerebro-pedal connective; there are four nerves to the sheath of the siphon, and three, large and long, to the siphon itself. The pedal ganglion in the female is symmetrical, and gives off twenty-seven nerves, in addition to two from the upper surface, one of which goes below the mouth. In the male the ganglion is asymmetrical, owing to the presence of the penial nerve.

The *Purpuridæ* and the *Buccinidæ* belong to the *Chiastoneura* of von Jhering; the sub-intestinal ganglion, is, however, attached to the right commissural ganglion by an accessory connective, short in *Purpura*, and shorter in *Buccinum*; in *Concholepas* an intimate union takes place. The relations with the vascular system are very constant; the anterior aorta passes below the visceral ganglia, and penetrates into the posterior and middle commissures, but below the anterior. The auditory nerve is connected with the cerebral ganglion; the pedal ganglion gives off nerves to the penis as well as to the foot; the right commissural ganglion gives off a single nerve to the walls of the body; the left, in addition, several parietal nerves, the columellar nerves, and two constant branches, one siphonal, one to the pad situated between the foot and the columellar muscle; the branchio-siphonal nerve gives off a branch to the olfactory organ of Spengel. In addition to characters drawn from the nervous system, may be mentioned the presence of a crop below the commissure, of a special œsophageal gland, and the absence of an efferent canal from the organ of Bojanus, which opens into the pallial cavity. Between

Nassa and *Buccinum* the differences are slight; in the *Purpuridæ* siphon is shorter than in the *Buccinidæ*, the crop well-developed, the special gland solid, and the stomatogastric cerebral centres closely united. *Concholepas* is a *Purpura*, modified by atrophy of the posterior lobe of the foot, and the development of an enormous anterior lobe, in consequence of which the viscera have acquired a dorsal position. BOUVIER (49).

8. *Organs of Sense.*

MOSELEY (273) shows that two kinds of tactile organs (megalæsthetes and micræsthetes) are present in the shells of certain species of *Chitonidæ*, and that well-developed eyes which are on the type of *Helix*, not of *Onchidium* or *Pecten*, occur as a modification of the former.

Brief summary of knowledge of sense-organs; SCHARFF (322).

Cephalic appendages of some *Pteropoda* have been examined by Jhering in SENEER (285). *Clione* has two pairs of tentacles, the posterior [illegible]usca. The eyes, and three pairs of buccal cones; these do not bear [illegible]licate plexus, sensory organs, which may be appropriated to a special [illegible]rd has a groove diate between that of taste and smell. They contain a mas[illegible] glandular cells, whose secretion overspeads their surface. *Clionopsis* has two pairs of tentacles, but no buccal cones. *Pneumodermon* also has two pairs of tentacles, and instead of buccal cones two acetabuliferous appendages. Regarding the structure of the suckers the author agrees in the main with NIEMIEC (278). Compare also WAGNER (373).

HILGER (182) has investigated the eyes of over 70 species of Gastropods, and divides them into two groups:—(1) In the lowest *Prosobranchiata*, *Cyclobranchiata*, *Aspidobranchiata*, &c., the eye is an open cup, though in some instances traces of what may have been a covering are found. (2) The eye is a space closed anteriorly by a "pellucida," and containing a lens or vitreous mass, or both. The optic nerve contains ganglion cells in all *Prosobranchiata*, other groups presenting variations in this respect. In contradistinction to FRAISSE, the author observed the optic nerve in *Patella*. The retina consists of two kinds of elongated nucleated cells, pigmentless and pigmented; they are disposed in groups, one of the former being surrounded by a number of the latter. Upon the layer formed by these rests one of clear rods, into the axis of each of which the end of a pigmentless cell projects. The cornea ("pellucida") consists of an inner and outer epithelium and intermediate connective tissue, which varies in thickness in different species. Lens and vitreous are commonly both present, but either or both may be absent; the last case is apparently seen in the *Cyclobranchiata*, though Hilger is disposed to attribute this to defective preservation. The vitreous is wanting in *Stylommatophora*, in which the rods rest directly upon the lens. The lens appears to be structureless in adults, but shows concentric layers in embryonic forms.

BÜTSCHLI (61) gives a comparison between the results of this paper and those of Grenacher, regarding the Cephalopod retina.

CARRIÈRE (67) finds that in most Gastropods the cornea consists of a thin layer of connective tissue, covered with epithelium, and lined by a

of unpigmented cylindrical cells; the retina consists of elongated pigmented cells, with flask-shaped unpigmented cells lying between them; the pigment is peripheral, leaving an axial portion ("rod") free; the colourless cells are probably epithelial in origin, and secrete the central jelly of the eye. The eye of *Haliotis* has a central cavity, and the gelatinous plug is perforated by a fine canal; open eyes are also found in *Trochus*. In *Æolis* the eyes are small and irregularly spherical; the inner wall consists of but few large cells, pigmented at the distal end, the cornea of small unpigmented cells; the author agrees in the main with Grenacher's views on the Cephalopod eye. The so-called "eyes" in *Cardium edule* and *Pinna* are not such. The pupil of *Pecten* is dichroic, and the number of the eyes increases with the growth of the animal. A ring of ganglia is described around the rods from which a layer of separate ganglion cells, with long processes, passes to the central rods. A tapetum a thrum produces the metallic lustre of the eyes. In the second paper asymmetryes of *Arca noæ* and *Pectunculus glycimeris* are described; they ganglia, and few broad cells, surrounded by pigment, and with a convex lows the usual former, a thickening of the cuticle forms a lens; the cells dactive system ass over gradually into those of the mantle.

Some experiments on the sensitiveness of the olfactory sense in certain *Pulmonata* are given by Graber, Biol. Centralbl. v. pp. 387 & 456.

See also Tafani (348).

9. *Generative Organs.*

Rouzaud (316) traces the genital organs of hermaphrodite Gastropods to a "primitive bud," arising at the back of the neck, which becomes afterwards club-shaped; at its point of attachment to the body-wall there is afterwards formed either the common genital opening (*Helicidæ*), or the female opening (*Limnæidæ*); the distal extremity is embedded in the liver, and becomes the hermaphrodite organ. A "penial bud" arises near its base; the club-shaped body separates into parallel cords, at first into two, the oviduct and vas deferens; then the copulatory pouch is separated off. To these primitive structures all the various modifications of the sexual organs are traced.

Genital apparatus of *Nanina* (*Xesta*) *sibylla*, Can., figured by Tapparone-Canefri, (66) fig. 9; that of *Limax brasiliensis* by Jhering (202); that of *H. quimperiana*, Fér., by Hesse (168), and of 5 species of *Bulimnus*, *id.* (169).

Lacaze-Duthiers (227) replies to the last criticism of Fol (p. 26), stating that he has repeated his observations, and is convinced of the the male of a canal leading from the genital gland to the right kidney. larva is

Ford (8) concludes his investigations into the dart-sac, and gives tract mical observations on some species which have no darts. Absence m a dart-sac and other peculiarities in the sexual organs of *Helix sericea*, Müll., noted by Ashford (7).

Platner (291) has examined the structure and movement of the spermatozoa in many species; a division into three was observed only in

Limnæa. According to the structure of the tail two groups m[illegible] made :—(1) In *Succinea*, *Carocolla*, *Helix*, the head has a twisted structure, consisting of two precisely similar threads; in the tail a third one is coiled round them. (2) The third thread is absent both in head and tail; the extreme tip of the latter consists only of one thread. Everywhere in the hinder two-thirds of the head is a strongly refracting central streak, and the tail has a spiral axial thread. The movement of the spermatozoon is an intermittent rotation about the axis, and cannot be attributed to a flagellate motion of the tail, which goes first.

Spermatogenesis in the *Pulmonata* has been observed by PLATNER (291A), who finds that at an early stage the spermatogonia and the ova are the only kinds of cells in the hermaphrodite gland; each of the former contains, in addition to the nucleus, a peculiar structure, consisting in *Arion* of an angular figure composed of rods, and in *Helix* of a coiled filament. Some spermatogonia form spermatocytes, but others persist, arranged in columns which arise from the alveolar wall, between the groups of spermatocytes. Spermatides are the final product of the division of the spermatocytes; they have a large granular nucleus, and show amœboid movements; from the protoplasm a process juts out, which increases in length, and is called the "primary spermatic filament," or extracellular portion of the spermatozoon. The nucleus becomes formed afresh, and by a peculiar invagination forms the intracellular portion of the future head, and unites with the primary filament. Some critical remarks are appended, showing the theoretical bearing of the observations.

Spermatozoa of *Anodonta cellensis* and *Paludina vivipara* (as well as other structures) figured by CARNOY (Cellule) to show the disposition of the nucleus, which vanishes in the latter species during development.

SABATIER (318) describes the formation of the egg-membranes of *Chiton*, and obtains results agreeing with those of Fol and others in the Tunicates; he also remarks on the disposition of the germinal vesicle. The same author (318A) has also observed that in *Buccinum* and *Limnæa* globules are extruded from the ova at various positions on their surface; for instance, opposite the point at which the polar cells appear; these globules may multiply by division outside the ovum.

VIALLETON (370) finds that on the ventral lobe of the buccal membrane, where spermatophores are attached, there are found pit-like glands (poches copulatrices). In *Loligo* these glands are united into a single mass, opening in the middle line, and the author has seen females hold their eggs between their ventral arms, and supposes that they are then fertilized before they receive their protective covering.

PATTEN (283) has artificially fertilized *Haliotis* and *Patella*.

Egg-capsules of *Fulgur* in process of development observed [illegible]ting in (132). *Fulgur perversus* has been observed to descend into the The preparatory to laying its eggs; it affixes the case to a shell, and t[illegible] in ascends till it can respire freely; in this position it completes the operation: WILLCOX (378).

Oviposition observed in *Parmacella valenciennesi*, Webb & V. Ben.; CROSSE (89).

.VAY (J. de Conch. xxiv. p. 383, 1881) records that *Helix cooperi* is viviparous. Further notes on the same subject; *H. hæmastoma* has an egg 17 mm. by 12 mm.: FISCHER, *l. c.* p. 384.

Mytilus edulis is bisexual, maturity occurring in April; MCINTOSH (242).

In *Clio borealis*, three individuals, not merely two, are necessary to copulation; WAGNER (373).

10. *Embryology.*

MCMURRICH (245) has observed a postoral band of cilia in several Gastropod embryos, and summarizes the possible phylogenetic history of the group thus:—"They and the *Annelida* have had their origin in a Trochophore. In the Gastropods this ancestor developed a univalve shell, represented by the larval shell, so often replaced, as development proceeds, by another. . . . The development of this shell, by increasing the specific gravity of the animal, rendered the simple præoral cilia of the Trochophore insufficient for active locomotion, and the extent of the band was increased by the region of the body on which it occurred being, as it were, pulled out laterally, the characteristic velum being thus produced."

Larva of *Paludina* is a Pilidium, that of *Teredo* a Trochosphere. The body, both in Annelids and Mollusks, "is the highly-developed oral lobe of the Trochosphere. The shell of the Mollusk arises on the surface of the body, equivalent to the dorsal surface of the Annelids. The velum is simply a larval organ, but the part of the body within its area is equivalent to the cephalic lobe of the Annelids, or the proboscis of *Thalassema*. In both Mollusks and Annelids, therefore, the oral lobe elongates at the expense of the preoral lobe, but the resulting body in one case covers itself with a shell, and in the other becomes segmented." CONN (84).

The cilia in Molluscan embryos, whilst in the egg, serve to increase the inception of oxygen and saline solutions through the egg-membrane; many details are also given regarding the motion; PREYER, Spec. Phys. des Embryo, pp. 385-391.

The early stages in the development of *Fissurella* exhibit no peculiarities. Below the rudimentary velum is a prominence indicating the future foot, and between these the rudimentary mouth, and opposite them the invagination for the shell. The shell shows traces of the twisting characteristic of *Gastropoda*. The larva at this stage is remarkable for the position of the foot, which is situated between the velum and the mantle, a condition rectified by a gradual process of torsion. The larva is now four days old; the velum is bilobed; but the digestive tract is not yet differentiated. Two prominences appear near the middle of the velum (tentacles); the foot bears an operculum and two ciliated appendages. The shell is still coiled, and covers the dorsal part of the embryo; the otoliths are visible, as is also the digestive tract. The larva now quits the glairy mass in which it was previously embedded, and crawls by the foot, rarely swimming. It is now about three

weeks old. The larva gradually becomes still more asymmetrical, the right side of the shell develops a notch, which deepens and gives the animal the appearance of an asymmetrical *Emarginula*. The edges of the notch gradually unite, leaving an aperture, and the condition approaches that of *Rimula*, and finally the spiral body reaches the summit of the shell, and the aperture disappears; BOUTAN (46).

The larva of *Gadinia* passes through trochosphere and veliger stages, and the embryonic shell is spiral, not patelloid, as in *Ancylus*; LACAZE-DUTHIERS (222A).

SALENSKY (319) finds that in *Vermetus* even the unsegmented ova exhibit a differentiation into proto- and deuto-plasmatic portions; directive corpuscles were not observed. Segmentation resembles that of other Mollusks; after the cleavage into sixteen, the micromeres flatten out over the surface of the yolk, and after they have surrounded about two-thirds of it, the egg flattens and bends towards the ventral side, forming the archenteron. A round blastopore is situated in the centre of this surface, but gradually passes backwards and becomes oval. Small macromeres are now formed by division, and form the secondary or definitive entoderm, which appears as a heap of small polygonal cells, filling the gastrula cavity, and projecting from the blastopore. The blastopore does not close, but becomes the mouth. The mesoderm arises from the ectoderm around the blastopore; at the same time appear the rudiments of the foot and the velum. The cephalic and pedal ganglia are independently developed; the former from two ectodermal plates, lying in front of the velum; they become invaginated, and the posterior angles of the depressions become the points of origin of the eyes; the ganglia remain a long time hollow; the auditory vesicles arise long before the pedal ganglia, as invaginations on the margins of the foot. The homology is suggested of the cephalic ganglia of *Vermetus* with those of Annelids, and of the pedal with the first ventral ganglia. The foot has two large glands, one already described by Lacaze-Duthiers, the other on the anterior margin, consisting of a compact mass of cells with a long duct. The mesoderm, at first of one layer, afterwards forms several, and splits into a somatopleure and splanchopleure, with a wide cœlom between them; a posterior undivided portion becomes the musculus columellaris; the pericardium appears early in the right side of the embryo, and forms a cavity homologous with the cœlom. The heart is developed from the splanchopleure in the posterior angle of the pericardial cavity. The mid-gut is only formed after the escape of the larva; the hind-gut earlier, as a plate of cylindrical entoderm cells. The œsophagus and radular pouch arise from the ectoderm surrounding the blastopore.

ZIEGLER (383) gives an elaborate account of the development of *Sphærium corneum*, L. The egg has a vitelline membrane, and the segmentation proceeds on the same type as that of *Teredo* (Hatschek) and *Unio* (Rabl). The blastula consists of a single layer of cells. Those forming the under surface show traces of an invagination, and are derived from the large yolk-containing cell; the hinder part is indicated by certain deeply-stained cubical cells, which afterwards form the shell-gland; within are one or two primitive mesoderm cells, probably derived from

cells which were previously separated from the large yolk-cell, although the possibility is not denied that they may be of ectodermic origin. The blastopore is in the form of a slit, which becomes completely closed, but whether from before or behind was not seen. The primitive enteron ends anteriorly in a mass of cells, posteriorly it remains in contact with the ectoderm, and the œsophagus arises by invagination; a comparison is instituted between the gastrulation of Lamellibranchs and of Gastropods. The Trochophore is described at length: the œsophagus passes upwards and backwards, and leads into a dilated stomach, which has two lateral anterior processes, the future liver; on either side the mouth is a triangular ciliated area, which is manducatory in function, and homologous with a similar tract in *Polygordius*. Resembles Gastropods in the early formation of the foot; the cavity of the Trochophore is a "primitive schizocœle." The kidney arises as a ciliated tube, which runs from before downwards and backwards, and leads into a large cell, which is probably perforated by it; anteriorly the canal is expanded into a funnel, but its continuity with the primitive schizocœle was not demonstrated. The byssus gland is formed by two invaginations in the hinder portion of the foot, and retains traces of its primitive bilateral symmetry even when closed. The liver-sacs exhibit periodic contractions at intervals of about fifteen seconds. The pericardium is developed from a small vesicle formed in the mesoderm above the genital cells on either side; behind each of these a number of mesoderm cells form a canal—the organ of Bojanus—the lower of which opens into the vesicle just mentioned; afterwards this canal is so directly continuous with the ectoderm that it appears to have arisen from it, which, indeed, is not impossible; it consists of three portions—(1) a short ciliated, (2) a long glandular, and (3) an efferent. The two pericardial vesicles unite both above and below the intestine, and their inner (median) walls form the wall of the ventricle; their cavity is regarded as a "secondary schizocœle," and the pericardium is not a part of the vascular system. The ganglia all arise from the ectoderm, and the visceral are the latest to develop. The structure of the adult gill is described.

Schmidt (325, 326) has infected fish with the larvæ of *Anodonta*, and has thus been able to throw light on their development during the parasitic stage. He agrees with Forel and Schierholz that the "Mittelschildtasche" of Flemming marks the posterior end of the embryo. On either side of the intestine, which is surrounded by a mass of indifferent tissue, is a hepatic dilatation. Two bands of cells, one on either side, are the rudimentary organs of Bojanus, not nervous structures. A peculiar muscle-cell, attached to the shell by numerous fine processes, lies parallel to the long axis of the embryo, and serves to attach it to the host. Immediately after the attachment of the Glochidium, the future foot becomes elevated as a blunt cone, and forces the oral invagination forward, whilst the margins of the lateral grooves, the future gills, become elongated, and ultimately separate into several papillæ. Many embryonic structures (byssus gland, sensory cells, adductor muscle, and mantle) now disappear. Certain cells of the mantle form the "mushroom-shaped body" of Braun, which is charged with the supply of calcareous matter

for the growing shell. The anus is formed by rupture, not invagination; the whole fore-gut is ectodermal, the mid- and hind-gut and stomach are endodermal in origin. The auditory sacs are formed about the tenth day, and sink inwards to the pedal ganglia. The heart arises in the form of a number of cells surrounding the rectum. The byssus-gland of the Glochidium is a special larval organ—an adaptive modification to its peculiar mode of life.

For a sketch of the life-history of the Oyster, see RYDER (317).

11. *Stray Biological Notes.*

Oysters in the Firth of Forth lie on the flat valve; CUNNINGHAM, Nature, xxxii. p. 597. The position varies according to the nature of the bottom, the flat valve being lower on rock, the convex on sand; WORTLEY-STUART, *t. c.* p. 625.

Left valve of the oyster fry always becomes attached. When they fix themselves to dead shells which have been thrown into the water for that purpose they become attached to the under surface, being thus protected from sediment. RYDER, *op. cit.* xxxiii. p. 81.

MÖBIUS [*t. c.* p. 52, and J. R. Micr. Soc. (2) vi. p. 52] states that, out of 143 specimens examined, 43 which bore portions of the bottom had all rested on the left side.

Segmentina lineata, Walker, spins threads; COCKERELL, Zool. (3) ix. p. 267.

Aplysia lives at 26° C. (?), *Pleurobranchæa* dies speedily at 40°, *Murex* withstands for a long time a temperature of 30°, and *Pecten* for a shorter period; FRENZEL, Arch. ges. Phys. xxxvi. p. 463.

Variation of *Littorina*, see HAACKE (152) and p. 86, *posteà*.

Cause of variation in *Limnæa* sought in alternations of dryness and moisture; DODD, J. of Conch iv. p. 304.

Remarks on adaptability to resist action of waves; HUNT, Nature, xxxii. p. 243.

The artificial culture of snails proposed by NINNI, *Rapporto a S. E. il Ministro di Agricoltura, &c. Rome: 16 pp. and map.

Rissoa octona, Linn., prefers dark-blue and dark-green light to bright red; GRABER, SB. Ak. Wien, xci. 1, pp. 144–148.

Some *Tectibranchiata* are carnivorous (*Scaphander*, *Philine*, *Doridium*), some omnivorous (*Gastropteron*, *Pleurobranchus*), and others herbivorous (*Aplysia*, *Notarchus*); VAYSSIÈRE (364).

Snails eating whitening; POULTON, Nature, xxxiii. p. 176.

A snail (*Helix aspersa*) twice found its way to a special place, and was watched during the process; FURTADO, *Zool. Sect. Lisb. Mus. Act. 27, 1885 [transl., Ann. N. H. (5) xvi. pp. 519 & 520].

Limpets return to same spot after feeding, but can also live long without moving; prefer hard smooth surfaces to soft ones; probably do not bore rock: ROBERTSON (311); see also DAVIS (103).

Rate of growth of clams (*Mya arenaria*); RYDER, Bull. U. S. Fish Comm. v. pp. 174–176.

Helix pomatia lives 4–5 years in captivity; KINKELIN (208).

Arion empiricorum lives only one season, no specimens surviving the winter; SIMROTH (337).

Paludina contecta and *Planorbis corneus* eaten by rats; OLDHAM, Naturalist, x. p. 274.

Unio, *Anodon*, and *Dreissena* eaten by birds and rats; *id. t. c.* p. 181.

Myicola metisiensis, Wright, Copepod parasitic on *Mya arenaria*, Gulf of St. Lawrence; WRIGHT (382).

Tethys leporina infested by *Phœnicurus*; LACAZE-DUTHIERS, C.R. ci. p. 30.

Oysters preyed upon by *Polydore* (*Leucodore*) *polybranchia*, sp. n., and other Annelids; HASWELL (163).

Oysters destroyed by a sponge (*Chalinula coxii*); v. LENDENFELD (230). See also ERJAVEC (116) and p. 65, *posteà*.

A new protozoan parasite on *Truncatella truncatula* (*Scyphidia fischeri*); VAYSSIÈRE (365).

Anodonta, young attached to gills of an Axolotl; RIEHM, Z. ges. Naturw. (4) iv. p. 202.

Poisonous effects of the bite of *Conus geographicus* in New Britain; HINDE, P. Linn. Soc. N. S. W. ix. pp. 944 & 945.

Poisonous effect of mussels from stagnant water; Science, vii. pp. 175 & 176. VIRCHOW (Arch. path. Anat. civ. pp. 161–180) discusses the case of poisoning by a *Mytilus* sp. which occurred at Wilhelmshafen. SALKOWSKI (*op. cit.* cii. pp. 578–592) compares the poisoning by mussels to that of curare.

Colours of Mollusks are treated of by CAMERANO, (65) p. 348. Black is rare; brown, grey, yellow, white, and red, common; violet, relatively abundant; blue, not rare; green, infrequent. Species with strong shells are more highly coloured, as a rule, than those with fragile shells. Often the bright colours are in less conspicuous parts. In naked marine forms mimetic colouring is often observed. *EIMER (Tag. Deut. Nat. Vers. lviii. p. 408), from observations on coloration, concludes that species originate mainly from variations due to constitutional causes.

SIMROTH (337) has made experiments on the development of colour in slugs, and comes to the following conclusions: (*a*) The coloration is dependent entirely on the influence of temperature during the chief period of development (from March to May); other influences are confined to the black pigment, so soon as the sole of the foot is entirely coloured. (*b*) Warmth inhibits the black pigment, or causes it to disappear, and augments the formation of the red. (*c*) Cold has the opposite effect. The red pigment appears to serve as a warning, for individuals with that colour were either rejected as food by other animals or the viscera only were devoured.

Green colour of oysters (huîtres de Marennes) due to a bluish pigment, "marennin," taken up from Diatoms, *Navicula ostrearia*, on which the Mollusk feeds, and which accumulates in secretory cells of the gill and tentacles; LANKESTER (229).

Green colour of clams due to Diatoms; RYDER, Bull. U. S. Fish Comm. v. pp. 181–185.

CERTES (71) has experimented on the power of oysters to take up

foreign colouring matters, and also suggests their use as vehicles for medicinal substances.

The parts most strongly coloured in *Clio* are those most active in the vital economy of the organism; Wagner, (373) pp. 113-115.

Phosphorescence; Giglioli & Issel, (138) pp. 93 & 109. Some instances in *Mollusca* recorded; McIntosh, (241); Hoyle, art. "Phosphorescence," Encycl. Brit. xviii. pp. 813 & 814.

12. *Abnormalities.*

Deformities of the aperture of *Physa acuta* living in a warm chalybeate spring; Regelsperger (306).

Abnormal spiral banding observed in certain species of land and fresh-water shells, by Cockerell, J. of Conch. iv. p. 374.

Modes of Collecting and Preserving.

Directions for obtaining marine *Mollusca*; Daniel (99).

Small bivalves placed in a groove beak upwards; Jeffery, J. of Conch. iv. p. 303. See also Reibisch (307).

Bands of *Helices*, when apparently absent, sometimes become visible on weathering or treatment with hydrochloric acid; Cockerell, Zool. (3) ix. p. 114.

Paryphanta hochstetteri. Shell splintered into pieces by the heat in Australia; Brazier, P. Linn. Soc. N. S. W. ix. p. 760.

Nomenclature.

Varietal nomenclature, Woodward (380); answered by Cockerell, Zool. (3) ix. p. 485; supported by Rowbotham, *t. c.* p. 486.

Popular names of various Mollusks used by the fishermen of Brest; Daniel (99).

"Mutation" and "variation," use of the words discussed by Foresti (134).

GEOGRAPHICAL DISTRIBUTION.*

Land and Fresh-water Mollusca.

I.—PALÆARCTIC ZONE.

Westerlund (377) continues his account of this region, treating of the *Succineidæ*, &c.

1. *Septentrional Region.*

British Isles.

List of species and varieties new to; J. of Conch. iv. pp. v. & vi. Account of land and fresh-water shells, by counties, continued by

* The Distributional Regions here adopted are those proposed in Fischer's Manuel de Conchyliologie (123).

...OR & ROEBUCK (352). 14 species of slugs, also 3 from Shetland, 5 from Faroe Is.; HEYNEMANN, (178) p. 248. *Helix villosa*, Drap.; COLLIER, J. of Conch. iv. p. 214. See also ADAMS (1A).

Greenock. Land-shells from neighbourhood of, with others from a canal, enumerated by SCOTT, P. N. H. Soc. Glasg. v. pp. 290, 291, & 310–313. Others from timber basins; STEEL, *op. cit.* i. pp. vi. & vii.

Northumberland. Few species from Tyne Valley; TAYLOR, Naturalist, x. p. 139.

Durham. Some species of slugs; ROEBUCK, *t. c.* p. 20. Other land and fresh-water shells; HUDSON, *t. c.* p. 112.

Yorkshire. *Achatina acicula* in magnesian limestone districts; EMMET, *t. c.* pp. 270–274, DARBISHIRE, *t. c.* p. 320, ROBERTS, *t. c.* p. 321. Species recorded by various observers; *t. c.* pp. 7, 18, 20, 42, 92, 227, 258, 260, 280, 308, 320, 348, & 380. *Paludina contecta* from the East Riding; NELSON, *t. c.* p. 20. A list of land and fresh-water shells from the neighbourhood of Lofthouse, given by ROBERTS, "Topography and Natural History of Lofthouse," vol. ii. pp. 236–244 (Leeds: 1885, 8vo). Land shells from Pontefract; ROBERTS (310). *Pupa marginata* var. *brevis*, Baudon, from Whitby; TAYLOR, J. of Conch. iv. p. 376.

Manchester. Few species mentioned by OLDHAM, Naturalist, x. p. 156.

Chester. List from the neighbourhood of; SHRUBSOLE (334).

Llandulas, N. Wales. 29 species collected by COLLIER, J. of Conch. iv. pp. 367 & 368.

Argyleshire, Loch Creran. *Rossia macrosoma*; CAMPBELL, Zool. (3) ix. p. 72 [probably *R. oweni*.—REC.].

Salop. Notes on *Mollusca* of, by HUDSON, J. of Conch. iv. pp. 353–355.

Oban. 21 species identified by DARBISHIRE, J. of Conch. iv. p. 350.

Lincolnshire. *Amalia gagates* var. *plumbea*; ROEBUCK, Naturalist, x. p. 366.

Nottingham. Notes on species from; *t. c.* pp. 20, 112, 181, & 321.

Northamptonshire. List of authenticated species; J. Northampt. Soc. iii. pp. 210–218 & 282–288. Notes on *Mollusca* of, at beginning of the century; BOSTOCK (38).

Preston Candover, N. Hants. 10 additional species, recorded by FITZGERALD (128). [See Zool. Rec. xxi. *Moll.* p. 22.]

Middlesex. Several species recorded by COCKERELL, Zool. (3) ix. p. 353.

Surrey, Kent, and *Middlesex.* A list of land *Mollusca* given by COCKERELL (83), and *t. c.* p. 115.

Surrey. A few species enumerated; ROWE, Garner, pp. 7–10 & 18–22.

Sussex. List of species from the eastern division of the county; JENNER (198).

Kent. *Ancylus fluviatilis* var. *costata*, Fér., from Folkstone; COCKERELL, J. of Conch. iv. p. 376.

Dorsetshire. 101 species enumerated, described, and figured, by MANSEL-PLEYDEL (248).

Cornwall. *Lehmannia arborum* var *bettonii*, Sordelli, recorded by ROEBUCK (314). *Arion ater* var. *bicolor*, *Limax maximus* var. *ferussaci*; BELT, Zool. (3) ix. p. 389.

Ireland. Varr. nn. of *Limax arborum* and *Arion ater*; ROEBUCK, Conch. iv. p. 375.

County Dublin. *Helix pisana* var. *alba*; COCKERELL, *t. c.* p. 368.

Connemara. List of land shells from black deposit in cliff; DARBISHIRE (101).

Holland and *Belgium.*

13 species of slugs enumerated; HEYNEMANN, (178) p. 247.

Grez. List of species found in neighbourhood by RAEYMAEKERS & DE LOË, (303) pp. xxxvii.-xl.

Antwerp. A few shells, including *Dreissena cochleata*, Nyst; *iid.* (302).

France.

20 species of slugs recognized by HEYNEMANN, (178) p. 247. 12 spp. nn. of *Anodonta*; LOCARD, (238) viii. *Pseudanodonta* sp., *Unio* sp.; *id.* (236).

Calvados. List of species, resembling those of Kent; COCKERELL, Zool. (3) ix. p. 439.

Puy-de-Dôme. 37 species enumerated by FISCHER (127), with comparisons of neighbouring regions, most interesting *Helix carthusiana* and *Cyclostoma elegans*, and absence of *Helix aspersa*.

Avignon. 2 species of *Bithinella* found in a well; *id.* (124)

Courtenot. *Bithinella bourguignati* and *Pisidium* sp. found in a well; *id. t. c.* p. 36.

Ribas, Pyrenees. 22 species (1 *Zonites*, 12 *Helix*, 1 *Ferussacia*, 5 *Pupa*, 1 *Balea*, 1 *Limnæa*, 1 *Pomatias*), by BOFILL (34).

Germany and *Austria.*

CLESSIN (78) concludes his manual of the land and fresh-water Mollusks, bringing the list up to 272 species. 18 species and varieties of slugs; HEYNEMANN, (178) p. 246. *Arion minimus*, sp. n., from Central Germany; SIMROTH, (336). Other slugs treated by the same (337). *Unionidæ*; see *SCHRÖDER, Bull. Soc. mal. Fr. i. p. 209. New localities for 7 species, mostly near Munich; REULEAUX (308). 18 additional species enumerated from the north-west, with synonymy; BORCHERDING (37).

Mainz. Two *Clausiliinæ*; BŒTTGER (29).

Halle. Few species from neighbourhood mentioned; GOLDFUSS, Z. ges. Naturw. (4) iv. p. 91.

Darmstadt. Few fresh-water species mentioned by BŒTTGER (31).

Lüneburg. 79 species from the neighbourhood, enumerated by BORCHERDING (36).

Bad Teinach. 5 species of land shells recorded by BŒTTGER (27).

Stuttgart. 4 species land shells; *Arion flavus* (Müll.) new to Württemberg: BŒTTGER (27). Species of *Trichia* found at Württemberg; KRIMMEL (217), and Math. nat. MT. ii. pp. 73–77.

Bohemia. *Clausilia tumida*, Zgl.; MERKEL, (260) p. 138.

Carlsbad. 6 species land shells; BŒTTGER (27).

Galicia. See BAKOWSKI (10, 11).

Carpathians. 46 species (none new) recorded by MERKEL, (260) p. 143. 81 species (1 new) from the Hohe Tatra; HAZAY (164). The same

furnished 89 *Gastropoda*, 1 Lamellibranch, collected at different altitudes, and enumerated by KOTULA (215); the country is divided into regions according to the *Mollusca*, which are most abundant on the calcareous formations.

Moravia. 39 additional species, 2 varr. nn.; ULICNY (361).

Krynica. 28 species enumerated by KOTULA (215).

Styria. List of shells collected in the neighbourhood of Peggau; TSCHAPECK (359). *Melania holandrei*, Fér., var. *afra*, Ziegl. Rossm., found in the Pössnitz; *id.* (360). 52 species of land shells from St. Gallen enumerated by BLUM (23); most interesting *Hyalina contracta*, West., and *Clausiliastra fimbriata* (Mhlf.).

Tyrol. *Planorbis ancylus*, sp. n., WESTERLUND, (377) p. 83.

Switzerland.

Mollusca of the lakes, enumerated and discussed by DU PLESSIS-GOURET (293), and FOREL (133). 14 species of slugs; HEYNEMANN, (178) p. 246. Remarks on the distribution of the land shells in the Alps by v. MARTENS (255). 3 species of land shells from the Brenner and Wallizer Alps; BOETTGER (27).

Weggis. 15 species recorded from by COCKERELL, Zool. (3) ix. p. 267.

Graubünden. List of land and fresh-water *Mollusca* continued and concluded, with tables of altitude and locality; AM STEIN (3).

Russia.

Esthland. Molluscan fauna; no spp. nn.: SCHMIDT (327).

Northern Asia.

Lake Baikal. 3 species of *Ancylus* described and figured by DYBOWSKI (111).

2. *Circummediterranean Region.*

Spain and *Portugal.*

Agriolimax maltzani, sp. n., from S. Portugal; SIMROTH (336).

Panticosa and *Valley of Cinca.* List of species from; FAGOT (119).

Algarve. 2 new *Helices*; MALTZAN (247).

Gibraltar. 6 species enumerated additional to Kobelt's list [Zool. Rec. *Moll.* xx. p. 25, & xxi. p. 25] by PONSONBY (300). 4 species of slugs recorded additional to those in previous paper; HESSE (170).

Valentia. *Helix quadrasi*, sp. n., HIDALGO (180).

Catalonia. 11 species new to the fauna; FAGOT (118).

See also CASTRO (69), GUÉNOT (149).

France.

Hérault. Notes on *Mollusca* of, rare and absent forms indicated; DUBREUIL (110)

Italy.

DROUET (108) gives an account of the *Unionidæ*, enumerating 43

Ireland. Varr. nn. of *Limax arborum* and *cocondylus* (1 new), 31 spec. Conch. iv. p. 375.

County Dublin. *Helix pisana* var.

Connemara. List of land shells, spp. & varr. nn.; PINI (289). 13 SHIRE (101). enumerated and described by POLLONERA 9 new); *id.* (299).

Holland and *Belgium*—*egnis*, sp. n., WESTERLUND, (377) p. 131.

13 species of slugs enu—*yalinia*, *Limax*, spp. nn., PINI (289).

Grez. List of spec—, 4 spp. nn. and 2 varr. nn.; *Acme* sp. n., *Clausilia* DE LOË, (303) pp

Antwerp. —*Hyalinia*, 3 species (1 new); ADAMI (1).

Sardinia. Notes on *Mollusca*; COSTA, Atti Acc. Nap. (2) i. 4, pp. 12 & 31.

Sicily. An exchange list of 271 species is published by PLATANIA (290). *Pomatias bœttgeri*, sp. n., WESTERLUND, (377) p. 118. *Clausilia brugnaneana*, sp. n., PINI (289) p. 379.

Malta. Remarks on some species by PONSONBY (301). *P*— —LL, Zool. *angulatus*, Phil.; COCKERELL, J. of Conch. iv. p. 366. —7), with com— *—arthusiana* and —

Austria.

Trieste. 14 species recorded by CLESSIN (80).

Carinthia. *Amalia robici*, sp. n., SIMROTH (336).

Dalmatia. *Pomatias tortivus*, sp. n., WESTERLUND, (377) p. 124. well;

Corfu. *Pomatias oribates*, sp. n., *id. op. cit.* p. 121.

Greece. 22 species (3 new) recorded by BŒTTGER (30).

Thessaly. 52 species, collected by Stussiner, enumerated, 4 new several new varieties and species new to the region: *id.* (347).

Crete. *Amalia cretica*, sp. n., SIMROTH (336).

Central Bosnia (*Nemila*). 36 species of Pulmonates enumerated by BŒTTGER (26).

Servia. DROUËT (109) supplements his list of *Unionidæ* from this province, bringing the number up to 32 species, 4 of which are new.

Montenegro. 32 land shells (1 new) enumerated by CLESSIN (82).

Montenegro and *South Dalmatia.* 11 species of *Pulmonata*, *Limax* (*Frauenfeldia*) *montenegrinus*, sp. n., and *Limax maximus* var. *ater*, *Helix serbica* and *Clausilia umbilicata*, new to the district; BŒTTGER (26). See also LETOURNEUX (231).

Levant. *Buliminus*, 5 spp. nn.; *id.* (33).

Northern Africa.

Egypt. Several species (1 new *Buliminus*) recorded; v. MARTENS (252). See also BERTHIER (18).

Tunis. 18 land and fresh-water shells (1 new); ISSEL (193).

Algeria. KOBELT (211) continues his "Excursionen," and enumerates many land shells, none new.

3. *Central Asiatic Region.*

Persia. Remarks on some shells of; POHLIG (294).

Ferghana. Several species (including 2 new *Helices*) recorded; v. MARTENS (251).

4. *Chinese Region.*

134 species of land shells, almost all new, described and figured, with habitats; HEUDE (173). 10 *Auriculidæ* (5 new), and addenda of numerous other forms, with many novelties, mostly from the Southern Provinces; v. MÖLLENDORFF (264). Remarks on species described by Heude & Gredler, with 4 spp. nn.; ANCEY (4).

Central China, Nankin. The Lamellibranchs are treated by HEUDE (172). 12 new species, including several of the South American genus *Mycetopus*.

Hoonan. 9 species (3 new); GREDLER (142), see also (142A). 1 sp. n., v. MÖLLENDORFF (265).

Badung. 18 new species (1 new genus); *id. t. c.*

Queichow. 6 species (4 new); GREDLER (142).

Swatow. *Melania subasperata*, sp. n., NEVILL, (277) p. 262.

Macao. *Melania tuberculata*, var. n., *id. t. c.* p. 244.

Formosa. *Minula* sp. n., SEMPER (332).

Melania libertina, var. n., NEVILL, (277) p. 267.

Nicobar Islands.

tosa, sp. n., [illegible]

5. *Japanese Region.*

...cies (7 new) of land and fresh-water shells, enumerated by ...OLLENDORFF (262).

Crassatella sublamellata, sp. n., KOBELT (212).

6. *Atlantidean Region.*

Canaries. Pulmonate land *Mollusca* shown to be less abnormal than generally supposed; HEYNEMANN, (178) pp. 291 & 292.

Canary Is. 124 species *Helix*, 36 *Bulimus*, and 43 others described and some figured: 14 species based on monstrosities, 6 introduced by reason of false indications of locality, 27 acclimatised, leaving 222 peculiar to the Canaries, and 14 common to them and other countries; MABILLE (239).

II.—PALÆOTROPICAL AFRICAN ZONE.

7. *Central African Region.*

Ukerewe (*Victoria Nyanza*). 3 new species; BOURGUIGNAT (41).

Tanganyika. 11 new species (2 new genera); *id. op. cit.*

Shoa (*Southern Ethiopia*). 43 species (33 new, 1 new genus) enumerated by *id.* (39).

Somaliland. 2 spp. nn., REVOIL (309); *Ampullaria*, 5 spp. nn., BILLOTTE (20).

Assab. *Vulsella assabensis*, sp. n., *Serpula milma*, sp. n. [*cf.* p. 84, *posteà*]; GREGORIO, (145) pp. 121 & 122.

Usagara. *Ennea usagarica*, *E. galactochila*, and *E. ringens*, spp. nn., CROSSE (87). 3 species of *Vaginula* (1 new); SEMPER (332).

See also BOURGUIGNAT (39, 40); ANCEY (4); CHARMES (74); GRANDIDIER (139).

8. *West African Region.*

Congo. 12 spp. nn. *Gastropoda* and *Lamellibranchiata* described and figured by MORELET (268).

Lower Congo. 9 *Gastropoda* (2 new) and 5 *Lamellibranchiata* (1 new) enumerated by BŒTTGER (32). In brackish water, *Donax* (*Chion*) *rugosus*, L., *Purpura coronata*, Lmk., and *Litorina* (*Melanorhaphe*) *angulifera* (Lmk.), and *L.* (*M.*) *cingulifera*, Dkr. In more salt water, *Ostrea cornucopiæ*, Chem., var. *guineensis*, Dkr., and *Mytilus* (*Aulacomya*) *senegalensis*, Lmk., var. *charpentieri*, Dkr. In fresher water, *Azara afra*, sp. n., and *Neritina* (*Neritæa*) *hessei*, sp. n.

Assinie. 4 new genera (*Adjua*, *Carvella*, *Moaria*, *Gulella*) and several species for Assinie, specimens in École des Mines, Paris; CHAPER (72). *Gulella treichi*, *Unio essoensis*, spp. nn., CHAPER (73). List of [illegible] 2 spp. nn., 1 g. n., *Tomostele*; ANCEY (5).

9. *South African Region.*

Cape Colony. *Helicopsis tabulæ*, *Hydrobia caledonens.* [illegible] *vaalensis*, spp. nn., CHAPER (73).

Delagoa Bay. *Vaginula maura*, sp. n., HEYNEMANN (175).

10. *Malagasy Region.*

Mauritius. 3 species of *Vaginula* (2 new); SEMPER (332). *Melania tuberculata*, 2 varr. nn.; NEVILL, (277) p. 246.

Comoro Is. 20 species of *Gastropoda* (14 new) described by MORELET (269). *Vaginula picta*, *V. grossa*, spp. nn., HEYNEMANN (175).

Seychelles. *Melania tuberculata*, var. n., NEVILL, (277) p. 241. *Paludomus ajanensis*, var. n., *id. t. c.* p. 296. *Vaginula bicolor*, sp. n., HEYNEMANN (175).

III.—PALÆOTROPICAL ORIENTAL ZONE.

12. *Indian Region.*

NEVILL (277) catalogues the genera *Ampullaria* to *Paludomus* of the Calcutta Museum, with many species and varieties. 1 new subgenus (*Mainwaringia*). *Vaginula* sp. n., SEMPER (332).

Kashmir. *Bythinia tentaculata*, var. n., NEVILL, (277) p. 39.

Madras. *Lyonsia morgani*, sp. n., from saltish water of river; CHAPER, (72) p. 50.

Andaman Is. *Melania*, 9 varr. nn. of different species; NEVILL, (277) pp. 228–281.

Ceylon. *Melania tuberculata*, var. n., *t. c.* p. 243; *M. rudis*, var. n., *t. c.* p. 275. *Paludomus microsculpta*, sp. n., *t. c.* p. 297; *P. erronea*, sp. n., *t. c.* p. 300, and 2 varr. nn., p. 299.

13. *Indo-Chinese Region.*

Assam. *Paludina dissimilis*, var. n., NEVILL, (277) p. 28. *Melania assamensis*, sp. n., *id. t. c.* p. 271. *Paludomus conica*, 2 varr. nn., *id. t. c.* p. 288.

Burma. *Paludina siamensis*, var. n., *id. t. c.* p. 26. *Melania*, 8 varr. nn., *t. c.* pp. 248–275; *M. subasperata*, sp. n., *t. c.* p. 263; *M. hungerfordiana*, sp. n., *t. c.* p. 270.

The Malay Peninsula. A list of 145 species (44 new) of land and fresh-water shells, from various parts of this region, which are compared with each other and with neighbouring countries. "The Malay Peninsula possesses a very remarkable Molluscan fauna, which forms a bond of connection between those of Indo-China and the Malay Islands. Although the majority of the species are peculiar, they all have their analogues in *Shan.*

Swatow. 2 countries"; p. 369. DE MORGAN (270).

Macao. *Vaginassatella acuminata*, sp. n., KOBELT (212).

Formosa. *Melania batana*, var. n., NEVILL, (277) p. 274.

Melania tuberculata, var. n., *id. t. c.* p. 245.

Nicobar Islands. *Melania zelebori*, var. n., *id. t. c.* p. 230; *M. sublutosa*, sp. n., *t. c.* p. 234; *Melania*, 3 varr. nn., *t. c.* pp. 237 & 238.

14. *Indo-Malay Region.*

Malay Archipelago. 4 species of *Vaginula* (2 new); SEMPER (332). *Neritina subocellata*, v. Mart.; SCHEPMAN (324).

Java. *Melania testudinaria*, var. n., NEVILL, (277) p. 269.

Moluccas. 35 species (4 new); TAPPARONE-CANEFRI (66).

Celebes. 5 species (3 new); *id. t. c.*

15. *Philippine Region.*

Paludina philippinensis, sp. n., *id. t. c.* p. 24; *Melania subula*, var. n., *t. c.* p. 228; *M. hastula*, var. n., *t. c.* p. 229; *M. canalis*, var. n., NEVILL, (277) p. 231.

Philippines. *Circe barandæ*, sp. n., HIDALGO (181).

Ternate. *Melania hastula*, var. n., NEVILL, (277) p. 229.

Celebes. *Neritina subocellata*, v. Mart.; SCHEPMAN (324).

IV.—AUSTRALIAN ZONE.

16. *Austro-Malayan Region.*

Solomon Islands. 66 species (65 *Gastropoda*, 10 new; 1 Lamellibranch, new) enumerated by E. A. SMITH (343). *Partula tryoni* and *P. flexuosa*, HARTMAN, (162) p. 204.

17. *Australian Region.*

Comparison of land shells of Australia with those of Tasmania; very few forms identical: TATE (349).

Murray River. *Physa smithi*, sp. n., CLESSIN (76).

18. *Austro-Polynesian Region.*

New Hebrides. *Hyalinia* (*Conulus*) *layardi*, sp. n., THOMSON (353).
New Caledonia. *Melania arthuri*, var. n., NEVILL, (277) p. 232.

19. *Polynesian Region.*

Marianne Islands. *Melania hastula*, var. n., *id. t. c.* p. 230.
Guam. *Melania acutissima*, var. n., *id. t. c.* p. 227.
Caroline Islands. *Partula rufa* (Less.) rediscovered on Oualan; HARTMAN, (162) p. 221.
Marquesas Islands. *Partula magdalinæ* and *P. bellulæ*, *id. t. c.* p. 203.
Navigator Islands. *Melania scitula*, var. n., NEVILL, (277) p. 234.
Society Islands. 139 species enumerated by GARRETT (136), of which 108 are peculiar; numerous species of *Partula* and of small *Helicidæ*; 20 new species.
Raiatea. *Partula navigatoria* (Pfr.) found here and not at Navigator Is.; HARTMAN, (162) p. 208.

20. *New Zealand Region.*

New Zealand. 16 species (none new), most previously described by R. B. Watson & E. A. Smith; enumerated by HUTTON (191). 11 *Limnæidæ* (5 new); *id.* (192).

V.—NEANTARCTIC ZONE.

21. *Patagonian Region.*

Rio Grande. *Limax variegatus* recorded as recent arrival, and most American *Limaces* said to be identical with European ones and probably imported; JHERING (202).
Montevideo and *La Plata.* 4 species of *Vaginula* (2 new); SEMPER (332).
Buenos Aires. Several land and fresh-water *Gastropoda* (2 new) recorded by DOERING (104).
Argentine Republic. 2 gg. nn., 3 spp. nn.; *id.* (105).

22. *Chilian Region.*

Vaginula nigra, sp. n., HEYNEMANN (175). 2 species of *Vaginula* (1 new), SEMPER (332).

23. *Peruvian Region.*

Gallapagos Islands. Species of *Bulimus* from; *ANCEY, Le Nat. vii. p. 63.

VI.—NEOTROPICAL ZONE.

24. *Columbian Region.*

Venezuela. 4 new species of *Vaginula*; Semper (332).

25. *Brazilian Region.*

Notes on some forms from, with 2 spp. nn.; v. Martens (254). New *Bulimus*; *id.* (256). 8 species of *Vaginula* (7 new); Semper (332).

Rio Janeiro. *Vaginula fusca*, sp. n., Heynemann (175).

South America. *Ampullaria* (*Pomus*) *martensiana*, sp. n., Nevill; (277) p. 10.

Piracicaba. *Castalia*, sp. n. [= *C. undosa*, v. Martens, (254) p. 148]; Nehring, (276) p. 126.

26. *Mexican Region.*

Mexico. 2 species of *Vaginula* (1 new); Semper (332).

Central America. 3 new species of *Physa*; Clessin (76).

27. *Caribbean Region.*

7 species of *Vaginula* (2 new); Semper (332).

Bahamas. *Helix* (*Hemitrochus*) *filicosta*, Pfr.; habitat hitherto unknown: Thompson (355).

Montserrat. *Pomatias labrosus*, sp. n., Westerlund, (377) p. 117.

29. *Atlanto-American Region.*

Florida. 83 species of *Gastropoda* enumerated by Dall (97); the most noteworthy being *Bulimulus multilineatus* (Say), *B. marielinus*, Poey, *Strobila hubbardi* (Brown), *Helix* (*Polygyra*) *auriformis*, Bland, *H.* (*P.*) *avara*, Say, *H.* (*Triodopsis*) *inflecta*, Say, *H.* (*T.*) *vultuosa*, Gld., *Guppya gundlachi* (Pfr.), *Zonites sculptilis*, Bland, *Limnæa humilis*, Say.

Mississippi Valley. 297 species of *Unionidæ* (*Anodonta* 33, *Margaritana* 16, *Unio* 248) recorded, with habitats, by Call (63).

Missouri. List of 55 species (*Planorbis sampsoni*, sp. n., Ancey); Sampson (320).

Kansas. 14 additional species (3 *Unio*, 2 *Anodonta*, 2 *Sphærium*, 1 *Pisidium*, 2 *Amnicola*, 3 *Lymnophysa*, 1 *Ancylus*), enumerated by Call (64). See also Binney & Gray (22).

Indiana. 62 species enumerated by Moore & Butler (267) from Franklin County.

Massachusetts. 54 species from Bristol County enumerated by Thompson (354).

Great Basin (*Nevada* and surrounding districts). List of recent and quaternary species (*Amnicola dalli*, sp. n., 2 varr. nn.); Call (62).

See also Binney (21).

30. *Canadian Region.*

Quebec. Helix cantiana from; LATCHFORD, Am. Nat. xix. p. 1111; Canad. Nat. xv. p. 82.

Manitoba. 72 species (*Planorbis umbilicatus*, sp. n.) enumerated, with localities and notes by CHRISTY (75).

Greenland. Agriolimax agrestis, L., and *Arion fuscus*, Müll.; HEYNEMANN, (178) p. 248.

Point Barrow. 3 species mentioned by DALL (95, 96).

MARINE MOLLUSCA.

List of species which have been found in widely-distant localities; SMITH, (341) pp. 4 & 5.

Deep Sea Researches.

VERRILL (367) enumerates a large number of all groups, dredged off the New England Coast, in from 1000–2500 fath.

Lamellibranchiata from 2900 fath. in North Pacific, also more than thirty localities from 1000–2650 fath.; SMITH, (341) p. 3. Some species occurring at very different depths; *id. t. c.* p. 5. Shells of abyssal species tend to be without colour, and thin; *id. ibid.*

Deep-sea *Mollusca*, record of a few species from Mediterranean; GIGLIOLI & ISSEL, (138) p. 247.

West and *Mid North Atlantic.* In water from 1000–1675 fath., about 60 species of Lamellibranchs (14 new) enumerated by SMITH, (341) pp. 9–11, from the 'Challenger' dredgings.

Mid South Atlantic. 1000–2650 fath., 6 Lamellibranchs (4 new): *Lyonsiella grandis*, *Cryptodon moseleyi*, *Malletia pallida*, and *Silenia sarsii*, the last type of a new genus; *id. t. c.* pp. 12 & 25.

Southern Ocean. 1375–1950 fath., 5 Lamellibranchs (all new): *Pecten pudicus*, *Amussium meridionale*, *Lyonsiella papyracea*, *Silenia sarsii*, *Neæra meridionalis*; *id. t. c.* p. 13.

Mid-Pacific. 1375–2900 fath., 8 Lamell branchs:—*Semele* (*Abra*) *profundorum*, *Callocardia* (?) *pacifica*, *Arca* (*Barbatia*) *pteroessa*, *A.* (*B.*) *corpulenta*, *Nucula profundorum*, *Sarepta abyssicola*, *Amussium meridionale*, spp. nn.; *id. t. c.* pp. 22 & 23.

Fusus abyssorum, Fischer, *Oocoris sulcata*, Fischer; FILHOL, La Nature, xiii. p. 230, fig. 3.

1. *Arctic Province.*

Behring's Sea. 40 Lamellibranchs (none new), with depths and precise localities, recorded by KRAUSE (216). 66 Gastropods (5 new) and 3 Pteropods (1 new); *id. t. c.*

Point Barrow. 1 Cephalopod, 1 Pteropod, 43 marine and 3 land Gastropods, and 13 Lamellibranchs are given by DALL (95). *Bela harpa*, *B. murdochiana*, *Strombella malleata*, spp. nn.; Prelim. List, *id.* (96).

White Sea. Remarks on the *Mollusca* of the Solowetzky Gulf, *Æolis*

...undus, sp. n., and others enumerated, with notes, by WAGNER (373). Contributions to Molluscan fauna of, with divisions into bathymetrical zones; HERZENSTEIN (167).

North of Siberia. Placophophora and *Gastropoda* of the 'Vega,' 40 spp. out of 67 common to Behring's Sea, 9 spp. nn.; AURIVILLIUS (9).

2. *Boreal Province.*

Tromsöfjord. SCHNEIDER (328) enumerates, with remarks, 1 Brachiopod, 67 *Lamellibranchiata*, 3 *Scaphopoda*, 8 *Chitonidæ*, 25 *Gastropoda*, the list of which is to be continued. None of the species are new.

Shetland. 28 species recorded, with depths, by PEARCEY, P. Phys. Soc. Edinb. viii. pp. 407–409.

3. *Celtic Province.*

Eastern Atlantic. 63 species (15 new) of Gastropods enumerated by JEFFREYS, from the 'Lightning' and 'Porcupine' dredgings (197). 22 *Polyceridæ* enumerated (E. Atlantic and Mediterranean) by JHERING, (200) p. 14.

Firth of Forth. 12 species recorded for the first time and 5 rarities from this locality; HENDERSON, P. Phys. Soc. Edinb. viii. pp. 114 & 312.

Yorkshire. Species recorded from; Naturalist, x. pp. 25, 92, 129, & 349.

Kent and *Surrey.* List given by COCKERELL (83).

Cornwall. List with notes; TREGELLES (356). *Octopus vulgaris*; DUNN, Zool. (3) ix. p. 353.

Scilly Islands. List of shells by SMART & COOKE (340); *inter alia*, *Loripes divaricatus*, L., *Trophon truncatus*, Strōm.

France (North). Estuary of the Somme examined by RAEYMAEKERS & DE LOË (303), and 5 Cephalopods, 45 Gastropods, 2 *Scaphopoda*, and 57 Lamellibranchs recorded.

New England Coast. VERRILL (367) enumerates 7 *Cephalopoda* (5 new), 22 *Gastropoda* (20 new), 2 *Heteropoda*, 4 *Pteropoda*, 3 *Scaphopoda* (2 new), 12 *Lamellibranchiata* (11 new), and 2 *Brachiopoda*, mostly from deep water. See also DALL (93) for 13,000 recent and quaternary forms.

4. *Lusitanian Province.*

Channel Islands. List copied from DUPUY, Bull. Soc. Nancy (2) vii. p. 118.

Guernsey and *Sark.* Several species recorded by TAYLOR (350).

Brest. 3 additional species (*Vellia*, *Azeca*, *Littorina*); DANIEL (100).

Portugal. List of 133 species from the south-west; 99 common to England, 115 to the oceanic coast of France, 116 to the Mediterranean; *Cymba olla*, L., and *Trochus pagaroides*, L., new to the Atlantic coast of Europe; 1 var. n. of *Nassa reticulata*, L.: NOBRE (280). 166 species from the north-east (2 Brachiopods, 76 Lamellibranchs, 84 Gastropods, 4 Cephalopods); *id.* (279).

Mediterranean. Monterosato (266) continues his list of shells with ... family *Pyramidellidæ*, as far as the genus *Anisocycla*; some new sections. 37 species (4 new) of Gastropods enumerated from the 'Porcupine' dredgings by Jeffreys (197). Notes on many recent and fossil species, see Gregorio (145). Nine Nudibranchs (*Facelina mæsta*, sp. n.); Bergh (16).

Roussillon. Bucquoy, Dautzenberg, & Dollfus (59) continue their treatise with the genera *Trochus*, *Clanculus*, and *Danilia*; no new genera or species.

Lyon. 21 marine species found in a Gallo-Roman necropolis, most of them such as used in the manufacture of purple; Locard (237).

Tunis. 10 marine species; Issel (193).

Madrela. *Vulsella caramagnæ*, sp. n., Gregorio, (145) p. 121.

New Russia. Several *Mollusca* enumerated amongst the fauna of various estuaries; Buchinsky (58).

Canaries. Several Lamellibranchs (*Montacuta pura*, sp. ... (341) p. 7.

... ups, dredged off

5. *Aralo-Caspian Province.*

Caspian Sea. A few species from, noticed by Pohlig (294).

6. *West African Province.*

Gorée I. 11 spp. nn.; Maltzan (246).

Gambia. *Halia priamus* dredged from 100 metres; Poirier (295).

Mouth of the Congo. 8 Gastropods and 5 Lamellibranchs (3 spp. nn.); Bœttger (32).

Ascension. Two Lamellibranchs; Smith, (341) p. 25.

7. *South African Province.*

Cape of Good Hope. 8 Lamellibranchs (*Carditella capensis*, *Neæra capensis*, spp. nn.); *id. t. c.* p. 12. *Megalocranchia maxima*, g. & sp. nn., Pfeffer, (288) p. 24.

Port Elizabeth. *Bullia pura*, sp. n., Melvill (259).

Tristan da Cunha. 8 Lamellibranchs, 2 new (*Venus philomela* and *Carditella exulata*); Smith, (341) p. 12.

Mauritius. *Rissoina ambigua*, var. n., Nevill, (277) p. 74. *R. insolita*, var. n., *id. t. c.* p. 96.

8. *Indo-Pacific Province.*

Zanzibar. *Sepia zanzibarica*, *S. venusta*, *Verrilliola nympha*, spp. nn. Pfeffer (288).

Red Sea. *Rissoina seguenziana*, Issel, var. n., Nevill, (277) p. 84. *R. orbignyi*, 2 varr. nn., *t. c.* p. 92. *Onoba delicata*, var. n., *t. c.* p. 120. *Vulsella assabensis*, sp. n., *Serpula milma*, sp. n. (*cf.* p. 84, *posteà*); Gregorio, (145) p. 122.

Gulf of Suez. McAndrew's list [see Zool. Rec. vii. p. 112] re-edited, with corrections and additions, by Cooke (85).

Persian Gulf. Rissoina micans, var. n., *R. mainwaringiana*, sp. n., Nevill, (277) pp. 76 & 83. *Fossar*, 3 spp. nn., *t. c.* pp. 167 & 168. *Conradia*, 2 spp. nn., *t. c.* p. 169.

Persia. Rissoina ambigua, var. n., *id. t. c.* p. 74.

Andaman Is. Rissoina woodmasoni, sp. n., *id. t. c.* p. 74. *R. montrouzieri*, 3 varr. nn., *t. c.* p. 91. *R. orbignyi*, var. n., *t. c.* p. 92. *Risella roepstorffiana*, *R. templiana*, spp. nn., *t. c.* p. 161. *Alaba woodmasoniana*, sp. n., *t. c.* p. 182.

Ceylon. Onoba delicata, var. n., *id. t. c.* p. 120. *Littorina erronea*, sp. n., *t. c.* p. 152.

Burma. Risella roepstorffiana, sp. n., *id. t. c.* p. 161. *Fossar mirabilis*, sp. n., *t. c.* p. 165. *Planaxis savignyi*, var. n., *id. t. c.* p. 186.

Penang. Fossar imperforatus, sp. n., *id. t. c.* p. 165.

Singapore. Rissoina insolita, var. n., *id. t. c.* p. 96. *Fossar styliferinus*, sp. n., *t. c.* p. 167. *Conradia stoliczkiana*, sp. n., *t. c.* p. 169.

Hong Kong. Sepiola bursa, *Sepia pagenstecheri*, spp. nn., Pfeffer (288); *Risella roepstorffiana*, sp. n., Nevill, (277) p. 161.

Formosa. Eulima candida, Marrat, hab. hitherto unknown; Smith (344).

Philippines. 37 Lamellibranchs, 11 new; *id.* (341) pp. 20 & 21.

Eastern Archipelago. 7 new Cephalopods; Pfeffer (288).

New Guinea. Sepioteuthis neoguinaica, *Liocranchia brockii*, spp. nn., *id. t. c.*

North of New Guinea, 1070–1675 fath. *Arca* (*Barbatia*) *corpulenta*, *Amussium watsoni*, spp. nn.; Smith, (341) p. 21.

Admiralty Is. Mactra (*Trigonella*) *incerta*, sp. n., *id. t. c.* p. 22.

Between *Australia* and *New Guinea.* About 120 Lamellibranchs (some 30 new species) recorded; *id. t. c.* pp. 17–19.

Moluccas. 17 Lamellibranchs (2 new); *id. t. c.* pp. 19 & 20.

Fiji Islands. 22 Lamellibranchs (6 new species); *id. t. c.* p. 16.

Tongatabu. 11 Lamellibranchs (*Circe amica*, *Pecten amicus*, spp. nn.); *id. ibid.*

New Caledonia. Avicula caledoniensis, sp. n., Gregorio, (145) p. 123.

Tahiti. 2 Lamellibranchs, *Cytherea* (*Dione*) *philippinarum* and *Lima tahitensis*, spp. nn.; Smith, (341) p. 23.

Ellice Is. Loligo brevipinnis, sp. n., Pfeffer, (288) p. 5.

Solomon Is. Verrilliola gracilis, sp. n., *id. t. c.* p. 22.

Marquesas Is. Loligo spectrum, sp. n., *id. t. c.* p. 5.

South Sea. Sepia polynesica, sp. n., *id. t. c.* p. 11.

Mascarene Is. Enoploteuthis hoylei, sp. n., *id. t. c.* p. 17.

Sandwich Is. 5 Lamellibranchs, 4 new; Smith, (341) pp. 22 & 23.

9. *Australo-Zealand Province.*

South Australia. 22 Lamellibranchs (6 new species); *id. t. c.* p. 14.

Bass' Strait. Sepiola tasmanica, sp. n., Pfeffer, (288) p. 6.

Port Jackson. Littorina filosa, var. n., Nevill, (277) p. 149. 60 Lamellibranchs (7 new species); Smith, (341) pp. 14 & 15

Off *New South Wales*, 410–950 fath. *Leda inopinata*, *L. ramsayi*, *Nœra angasi*, spp. nn., *id. ibid.*

Lord Howe I. *Dolium variegatum*, WILKINSON, Zool. Anz. viii. p. 760.

North of New Zealand, 600 & 700 fath. *Limopsis lata*, *Pecten kermadecensis*, spp. nn., *id. ibid.*

New Zealand. *Hyalea* sp.; WINKELMANN, N. Z. J. Sci. ii. p. 484. A new *Argonauta*; KIRK (209). 1 new *Octopus*; PARK, Tr. N. Z. Inst. xvii. p. 198. 9 Lamellibranchs (2 new); SMITH, (341) p. 15.

Campbell I. 2 Cephalopods, 13 Gastropods (7 new), 5 Chitons (3 new), 4 Lamellibranchs (1 new), with comparative remarks on neighbouring faunas; FILHOL (122).

10. *Japanese Province.*

Japan. 14 Lamellibranchs (4 new species); SMITH, (341) p. 2[illegible] *soina monilifera*, sp. n., NEVILL, (277) p. 79. *Rissoina pse*[illegible] sp. n., *t. c.* p. 98. [illegible]aps, dredged off

11. *Peruvian Province.*

Chili. *Steenstrupiola chilensis*, *Onychoteuthis brachyptera*, *Verrilliola nympha*, *Loligopsis schneehagenii*, spp. nn., PFEFFER (288).

13. *Californian Province.*

Some species (3 new) recorded by ORCUTT (281).

15. *Antarctic Province.*

Patagonia. 10 Lamellibranchs (*Nœra patagonica*, *Pecten subhyalinus*, *Solemya patagonica*, spp. nn.); SMITH, (341) pp. 23 & 24.

Falkland Is. 5 Lamellibranchs (*Cryptodon falklandica*, sp. n.); *id. t. c.* p. 24.

South Georgia. 34 species (including 3 Chitons and 3 Nudibranchs, and 10 new species), enumerated by v. MARTENS (253).

Prince Edward's Is. 14 Lamellibranchs (11 new); SMITH, (341) p. 13.

Kerguelen I. 20 do. (8 spp. nn.); *id. ibid.*

16. *Patagonian Province.*

La Plata. 8 Lamellibranchs; *Nœra platensis*, *Tellina* (*Macoma*) *uruguayensis*, spp. nn.; SMITH, (341) pp. 24 & 25. 27 spp. nn. (1 g. n.), ROCHEBRUNE & MABILLE (313).

17. *Caribbean Province.*

Off St. Paul's Rocks, 104 fath. *Lima lata*, sp. n.; *id. t. c.* p. 11.

Off Fernando Noronha, 25 fath. 6 Lamellibranchs (2 new, *Ervilia subcancellata* and *Pecten noronhensis*); *id. ibid.*

...zian Coast. 13 do. (8 new) ; *id. ibid.*

Barbados. Sepioteuthis ehrhardti, sp. n., PFEFFER, (288) p. 3.

St. Thomas. Cranchia tenuitentaculata, sp. n., *id. t. c.* p. 26.

West Indies. 37 Lamellibranchs (26 spp. nn.), enumerated by SMITH, (341) pp. 7 & 8.

18. *Transatlantic Province.*

Cape Hatteras. 84 shallow-water species (20 new), enumerated by BUSH (60).

Bermuda. 22 Lamellibranchs (10 new) dredged by the 'Challenger' ; SMITH, (341) p. 8.

North Atlantic generally. 10 Cerithiopsides (3 spp. nn.) described and figured by WATSON (374). 9 Nudibranchs ; BERGH (16). *Steenstrupi-Penantica, Sepiola pusilla, Enoploteuthis pallida, Onychia binotata, Singapor*[illegible]EFFER (288). Numerous species common to the European sp. n., *t. c.* p. 1. sides of the Atlantic, recorded by JEFFREYS (196).

Hong Kong. (1 g. n., 5 spp. nn.), 30 *Gastropoda* (21 spp. nn.), 3 *Solenoconchæ* (*Risso*, nn.), 14 *Lamellibranchiata* (12 spp. nn.), enumerated by VERRILL (367), many from deep water (2574 fath.).

PALÆONTOLOGY.

Some recent species from St. Erth, Lands' End, enumerated by SEARLES WOOD, Q. J. Geol. Soc. xli. pp. 65–71. A few from the Boulder Clay near Berwick-upon-Tweed, by GUNN (151). Some recent species in the Post-glacial Shell Beds at Uddevalla, Sweden ; MARK STIRRUP, P. Manch. Soc. xxiv. pp. 58–64.

For many post-tertiary forms see GREGORIO (145).

Middle Pleistocene fossils of "Mosbacher Sand" compared with those of Eastern Germany (7 spp. common), and the Alps (6 spp. common) ; BŒTTGER (28) See also BRÖMME, JB. nass. Ver. xxxviii. pp. 72–80.

For a comparison of the recent and quaternary *Mollusca* of the Great Basin, U.S.A., see CALL (62). DALL's list (93) of recent and fossil species of the Eastern United States has been alluded to, p. 55. Notes on Pleistocene fossils from Anticosti ; C. E. GRANT & SIR W. DAWSON, Canad. Rec. Sci. ii. pp. 44–48.

Certain Australian species supposed to be identical with living ones noted by JOHNSTON, P. R. Soc. Tasm. (1884) pp. 199 & 220. On the same subject ; TATE, *t. c.* pp. 207–214.

A list of recent shells found in clay on the Maclay Coast of New Guinea, which seem to have been thrown up from the ocean by some volcanic agency, is given by BRAZIER, P. Linn. Soc. N. S. W. ix. pp. 988–993.

HISTORICAL CHANGES.

Clams stated to have been purposely introduced into Delaware Bay ; MOORE, Bull. U. S. Fish Comm. v. p. 426. *Mya arenaria* to San Francisco ; STEARNS, *t. c.* p. 356.

Transplantation of *Tapes staminea*; Science, vi. p. 53 (abstr. ... mal. Ges. xvii. p. 123).

Venus mercenaria acclimatised in the Dee; SHRUBSOLE, (334) p. 110.

Helix cantiana from Quebec; LATCHFORD, Am. Nat. xix. p. 1111.

Limax hewstoni is an *Amalia*, probably *gagates*, imported into America; HEYNEMANN, (178) p. 269. See also JHERING, (202) and p. 52, *antea*.

USE BY MAN.

Use of shells as ornaments, dress, &c.; Chall. Nar. i. pp. 518, 709, 710, & 716.

Use of *Hybocystis*-shells, filled with perfume, as ornaments; DE MORGAN, (270) p. 367.

Shells of *Melania* (?) used in the manufacture of lime for chewing with betel; *id. t. c.*

Conch-shell among insignia of office; Nature, xxxi. p. 492.

Pearls. Pearl-fisheries of Tahiti; BOUCHON-BRANDELY, Fish Comm. v. pp. 292–294. General account of pearls, dredged off ... Encycl. Brit. xviii. pp. 446–448. A general account of ... pearls is given by MÜLLER (274). *Strombus* sometimes produces a beautiful pink pearl, and the shells are imported in large numbers for the manufacture of porcelain, and for cutting into cameos; TRYON (358) p. 106. Mode of capture, &c.; GIGLIOLI & ISSEL, (138) pp. 293–327. Purple of *Murex*, *t. c.* pp. 329–374; applications of shells, *t. c.* pp. 375–385; culture of oysters, *t. c.* pp. 387–415; and that of other edible *Mollusca*, *t. c.* pp. 417–433.

CEPHALOPODA.*

OCTOPODA.

PTEROTI.

Cirroteuthis plena, Martha's Vineyard, *C. megaptera*, Chesapeake Bay, U.S.A., spp. nn., 1000–2500 fath., Verrill, (367) pp. 404–408, pl. xlii. fig. 3, pl. xliii. figs. 1 & 2; also eggs referable to the same genus dredged in 400–1100 fath., *id. t. c.* p. 410. *C. magna*, Southern Ocean (1375 fath.), *C. meangensis*, N. Pacific (500 fath.), *C. pacifica*, S. Pacific, spp. nn., Hoyle, (186) pp. 233–235, (188) pp. 109–112.

AMPHITRETIDÆ.

Amphitretus, g. n. Suckers in a single series; interbrachial membrane very wide; mantle fused with the siphon in the middle line, so that there are two openings into the branchial cavity. For *A. pelagi-*

* The arrangement in families is that of FISCHER, Manuel de Conchyliologie (123), except in the *Cephalopoda*, where a recently-published Catalogue by the Recorder has been followed, and in the *Nudibranchiata*, where BERGH has been taken as the authority.

..., S. Pacific; Hoyle, (190) p. 271, fig. 106, (186) p. 235, and (188) p. 113, woodcut.

ARGONAUTIDÆ.

Argonauta gracilis, sp. n., New Zealand, Kirk (209).

OCTOPODIDÆ.

Octopus comes out to feed at night; Nye, Bull. U. S. Fish Comm. v. pp. 189 & 190.

Octopus grönlandicus (Dew.) Mörch (probably = *O. arcticus*.—REC.), from Point Barrow; Dall (95). *O. maorum*, Hutton, *Pinnoctopus cordiformis* (Q. & G.), from Campbell I.; Filhol, (122) p. 520. *O. maorum ola atlan* length of over six feet; in addition to hectocotylization of male, spp. nn.; P[illegible]ers of female are modified into small tubercles: Parker, and American *rucosus*, Tristan da Cunha, *O. boscii* var. *pallida*, Bass 6 *Cephalopoda*, *tlis*, Port Jackson, *O. hongkongensis* (= *O. punctatus*, Gabb. [illegible] 2 sp[illegible]n, *O. tonganus*, Tongatabu, *O. vitiensis*, Fiji, *O. duplex*, Australia, *O. bandensis*, Banda, *O. marmoratus*, Sandwich Is., *O. bermudensis*, Bermuda, *O. levis*, Heard I., *O. januarii*, Brazil and N. Pacific, spp. nn., Hoyle, (186) pp. 222–230, and (188) pp. 94–105. *O. communis*, sp. n., N. Zealand, Park, Tr. N. Z. Inst. xvii. pp. 198 & 199.

Eledone brevis, S. Atlantic (600 fath.), *E. rotunda*, Southern Ocean (1950 fath.) and S. Pacific (2225 fath.), spp. nn., Hoyle, (186) pp. 230 & 231, and (188) pp. 105 & 106.

Japetella, g. n. Mantle opening wide; suckers in a single series; lateral arms much the longest. For *J. prismatica*, sp. n., S. Atlantic; *id.* (190) p. 271, fig. 107, (186) p. 231, and (188) pp. 107 & 108, woodcut.

Hoylea, n. n. for *Hallia* (preoccupied); resembles *Eledone*, but with a marginal web on either side the body [see Zool. Rec. xxi. *Moll.* p. 37]: Rochebrune (312).

DECAPODA.

MYOPSIDA.

SEPIOLIDÆ.

Sepiola atlantica, d'Orb., and *S. rondeleti* not sexually but specifically distinct; Pelseneer (286). *S. bursa*, Hong Kong, *S. tasmanica*, Tasmania, *S. schneehagenii*, Banda Sea, *S. pusilla*, Atlantic, *S. rossiæformis*, Sunda Sea, spp. nn., Pfeffer, (288) pp. 6–8, figs. 6–10.

Promachoteuthis, g. n. Body short, rounded, with two large fins posteriorly; head and eyes small; arms conical, with two series of spheroidal suckers; extremities of tentacles wanting. For *P. megaptera*, sp. n., N. Pacific; Hoyle, (190) p. 273, fig. 109, (187) pp. 181 & 182, and (189) pp. 283–285, woodcut.

Sepiarii.

Sepia zanzibarica, *S. venusta*, Zanzibar, *S. pagenstecheri*, Hong Kong. *S. singaporensis*, Singapore, *S. polynesica*, South Sea, spp. nn., Pfeffer, (288) pp. 10–12, figs. 11–15. *S. esculenta*, *S. andreanoides*, *S. kobiensis*, Japan, *S. elliptica*, *S. smithi*, *S. sulcata*, *S. kiensis*, *S. papuensis*, South of Papua, spp. nn., *S. cultrata*, Streenstrup, MS., off Australia; Hoyle, (187) pp. 188 & 189, and (189) pp. 291–304.

Metasepia, subg. n. Characterized mainly by rhomboidal shell, whose dorsal surface is uncovered by calcareous deposit. For *S.* (*M.*) *pfefferi*, sp. n.; *id.* (187) p. 199, and (189) pp. 304–306.

Sepiella curta, *S. ocellata*, Java, *S. ovata*, *S. obtusata*, hab. ?, spp. nn., Pfeffer, (288) pp. 13–16, figs. 16–19.

Loliginei.

Sepioteuthis ehrhardti, Barbados, *S. neoguinaica*, New Guinea, spp. nn., Pfeffer, (288) pp. 1 & 2, figs. 1 & 2.

Loligo indica, Java, *L. brevipinnis* (name preocc., = *L. pfefferi*, Hoyle, 1886), Ellice Is., *L. spectrum*, Marquesas Is., spp. nn., *id. t. c.* pp. 2–6, figs. 3–5. *L. ellipsura*, Patagonia, *L. galatheæ*, Steenstrup, MS., Philippines, *L. kobiensis*, *L. edulis*, *L. japonica*, Stp., MS., Japan, spp. nn., Hoyle, (187) pp. 182–188, and (189) pp. 285–291. *L. forbesii*, Stp., redefined and compared with *L. vulgaris*; Hoyle (185). *L. sagittata* (? *Ommastrephes* sp.—Rec.) and *Octopus* (*minimus*?) recorded among phosphorescent *Mollusca*; Giglioli & Issel, (138) p. 109.

Squids most abundant in early part of year; Southwick, Bull. U. S. Fish Comm. v. p. 358.

Œgopsida.

Ommastrephini.

Xiphoteuthis (*Ommastrephes*) *ensifer*, Owen, = ? *Ommatostrephes pteropus*, Stp., *Loligo brongniartii*, Blv., and *Loligo todaropterus*, d. Ch.; Steenstrup (346).

Ommastrephes bartramii, and probably most large oceanic Cephalopods, feed chiefly on small *Crustacea*, &c., like other large pelagic creatures; *id. t. c.*

Bathyteuthis, g. n. Body subcylindrical, bluntly pointed behind, where are two small rounded fins; head broad, eyes prominent; buccal membrane with suckers; arms short, suckers in two series; tentacles slender, tapering. Type, *B. abyssicola*, Southern Ocean, 1600 fath.; Hoyle, (190) p. 272, fig. 108, and (189) pp. 308–310, fig. 2.

Benthoteuthis megalops, g. & sp. nn., off Martha's Vineyard, U.S.A., 600–1000 fath.; Verrill, (367) pp. 401–403, pl. xliv. fig. 1 [*Benthoteuthis* = *Bathyteuthis*. In the Zool. Jahresber. for 1885, p. 72, this genus is erroneously referred to the *Onychoteuthidæ*.—Rec.]

Dosidicus steenstrupii, sp. n., hab. ?; Pfeffer, (288) p. 20, fig. 27.

...strupiola, g. n. Body short; fins rounded; siphonal groove indistinct; ocular aperture small, with sinus; buccal membrane without lappets; siphon without valve, but with two ligaments; arms with two series of suckers; tentacles with four, but without fixing-cushions. *S. chilensis*, Chili, *S. atlantica*, Atlantic, spp. nn.; *id. t. c.* pp. 16 & 17, figs. 20 & 21.

Tracheloteuthis, g. n. Allied to *Ommastrephes* and *Architeuthis*; Steenstrup (345). (*Verrilliola*, Pfr., and *Entomopsis*, Rochebr., possibly synonyms.—Rec.) For *T. riisei*, *T. behnii*, spp. nn.

Ouroteuthis megaptera (nomen tantum), from 3175 metres (1670 fath.), by the 'Talisman'; Filhol, La Nature, xiii. p. 230.

Hyaloteuthidæ, fam. n., for *Hyaloteuthis* (name preocc.) and *Verrilliola* (= ? *Tracheloteuthis*, Stp.), gg. nn. For *Loligopsis vermicularis*, Rüppell, and *V. gracilis*, sp. n., Solomon Is.; *V. nympha*, Chili, Zanzibar. Pfeffer, (288) pp. 21–23, figs. 28 & 29.

Onychii.

Enoploteuthis hoylei, Mascarene Is., *E. pallida*, South Atlantic; Pfeffer, (288) pp. 17 & 18, figs. 22 & 23.

Ancistrocheirus megaptera, sp. n., off Martha's Vineyard, U.S.A., 707 fath., Verrill, (367) pp. 399 & 400, pl. xlii. figs. 1 & 1*a*.

Teleoteuthis agilis, sp. n., off Chesapeake Bay, U.S.A., *id. t. c.* p. 400, pl. xlii. pp. 2 & 2*a*. *Teleoteuthis*, n. n., = *Onychia*, Lesueur (preocc.).

Onychia binotata, Atlantic and Layas Is., *O. curta*, Banda Sea; Pfeffer, (288) pp. 19 & 20, figs. 24 & 25.

Onychoteuthis brachyptera, sp. n., Chili, Pfeffer, (288) p. 20, fig. 26.

Taonoteuthi.

Histiopsis, g. n. Resembles *Calliteuthis*, but has a web between the dorsal, dorso-lateral and lateral arms; the suckers are in two series; the siphon has a suspensory ligament and a valve. Type, *H. atlantica*, sp. n., Mid South Atlantic; Hoyle, (187) pp. 201 & 202, and (189) pp. 306–308.

Cranchiæformes.

Megalocranchia, g. n. Allied to *Cranchia*. Body smooth; head large; arms and tentacles well-developed, and with toothed suckers. Type, *M. maxima*, Cape of Good Hope; Pfeffer, (288) p. 24, fig. 32.

Liocranchia, g. n. Body smooth; head small; arms slightly developed; suckers of arms and tentacles with smooth rings; one row of chitinous tubercles down the back, and two down each side of the body. Type, *L. brockii*, Java Sea; *id. t. c.* p. 25, fig. 33.

Cranchia tenuitentaculata, sp. n., St. Thomas, *C. hispida*, sp. n., hab?; *id. t. c.* p. 26, figs. 36 & 37.

Taonius, Stp., and *T. hyperboreus*, Stp., redefined more fully; Hoyle, (184) pp. 315–318, 321, & 322.

Leachia, Lesueur, redefined; *id. t. c.* p. 325.

Loligopsis restricted, as by Steenstrup & Verrill, to type species (*L.*

peronii, Lmk.), the other species which have been referred to t discussed, and their positions determined ; *id. t. c.*

Loligopsis schneehagenii, sp. n., Chili, Pfeffer, (288) p. 23, fig. 31.

PTEROPODA.

GYMNOSOMATA.

Wagner (373), on the basis of his investigations into *Clio borealis* and comparison with other forms, places the Pteropods between the Heteropods and Cephalopods, and divides them into three groups : I. *Pt. alata* (*Cymbulia*, *Tiedemannia*) ; II. *Pt. pterocephala* (*Criseis*, *Cavolinia*, *Hyalea*) ; III. *Pt. deutocephala* (*Clio*, *Pneumodermon*, *Spongobranchus*). Three individuals of *Clio borealis*, not two, are concerned in copulation. Anatomy is fully treated.

Clione limacina, Phipps, figured by Krause, (216) p. 298, pl. xviii. figs. 19*b–d* ; *C. dalli*, sp. n., *id. t. c.* pl. xviii. fig. 19*a*.

Cliopsis, Troschel, is a well-marked genus ; has a terminal gill like *Pneumodermon*, formed of a low circular collar ; no lateral gill ; penis of Troschel is an elongated buccal tube. Boas, (25) p. 689.

Cirrifer, Pfeffer, appears from examination of type to be a badly preserved *Pneumodermon* ; *id. t. c.* p. 690.

Dexiobranchæa, g. n., *id. t. c.* p. 688 ; for *Pneumodermon ciliatum*, Gbr. Only possesses one gill, the lateral gill of *Pneumodermon*, which is represented by a well-developed triangular cutaneous process; has two arms with suckers which appear here shortened and modified.

Spongiobranchæa elongata, d'Orb., should be referred to *Clione* ; *id. t. c.* p. 688. *S. australis*, d'Orb., is, however, the type of a well-marked genus allied to *Pneumodermon* ; *id. ibid.*

THECOSOMATA.

Macdonald (240) corrects the mistaken views of previous observers who have depicted *Cymbulia* with the toe of the slipper anteriorly, and gives an enlarged figure of the animal with expanded fins.

Hyalea, occurrence of off New Zealand ; Winkelmann, N. Z. J. Sci. ii. p. 484. *Hyalæa* (*H. tridentata*, Lmk.?), lat. 40°, long. 14° W. ; Krause (216) p. 300.

GASTROPODA.

PULMONATA.

STYLOMMATOPHORA.

GEOPHILA.

Heynemann (178), under the title "Naked Land Pulmonates," confines his attention to those which "bear either no shell or one which is not spiral," and gives a summary of their distribution, with lists for the different countries.

Agnatha.

Tryon (358) divides the *Agnatha* into the following families : *Testacellidæ*, with 5 genera, *Testacella*, *Daudebardia*, *Chlamydephorus*, *Plectrophorus*, *Selenochlamys* ; *Oleacinidæ* ; *Streptaxidæ*, with *Streptaxis*, *Gibbus*, subgenera *Ennea* and *Diaphora*, and *Streptostele* ; and *Helicoidea*, including *Guestieria*, *Diplomphalus*, *Micromphalia*, *Rhytida*, *Paryphanta*, *Elæa*, *Aerope*.

Testacellidæ.

Adjua brevis, g. & sp. nn., Senegal, Chaper, (72) p. 44, pl. i. fig. 4.

Azeca tridens, Pulteney, Douarnenez, near Brest ; Daniel (100).

Chlamydephorus gibbonsi, Binney. Generic name proposed to be changed to *Apera*, n. n., the mantle being absent rather than continuous over the whole body ; Heynemann (176).

Cochlicopa (*Hypnophila*) *cyclothyra*, sp. n., Greece, Bœttger, (30) p. 121.

Ennea humboldti, *E. ovularis*, *E. corneola*, *E. vitrea*, *E. plicigera*, spp. nn., Comoro Is., Morelet, (269) pp. 294–296, pl. xiv. figs. 2, 6, 11, 12, & 5. *E. circumcisa*, sp. n., Toumby, Mouth of Congo, *id.* (268) p. 29, pl. ii. fig. 3. *E. usagarica*, *E. galactochila*, *E. migens*, spp. nn., Usagara, E. Africa, Crosse (92). *E. fuchsi*, sp. n., Queichow, Gredler, (142) p. 223. *E. vriesiana*, sp. n., Guinea, Aucey, (5) p. 145. *E. doliolum*, sp. n., China, Heude, (173) p. 116, pl. xxx. fig. 15. *E. dolium*, Heude (174), = *E. doliolum*, Heude, *nec* Morelet.

Glandina poireti, C. Pfeffer, perforates the shell of *Cyclostoma elegans* ; Erjavec (116).

Gulella elimensis, *G. assiniensis*, spp. nn., Senegal, Chaper (72), pp. 51 & 53, pl. i. figs. 13–18. *G. treichi*, sp. n., Assinie, *id.* (73) p. 485, pl. xi. figs. 10 & 11.

Oleacina, Bolten, is preferred to *Glandina*, Schuhmacher ; Tryon (358).

Streptaxis plussensis, sp. n., Perak, de Morgan, (270) p. 371, pl. v. fig. 1. *S. occidentalis*, *S. orientalis*, spp. nn., China, Heude, (173) p. 118, pl. xxx. figs. 23 & 22.

Testacella common in Hérault, some observations on habits ; Dubreuil, (110) p. 300. *T. maugei* and *T. haliotoidea* described, with figures of the former and notes on habits, by Mansell-Pleydell (249).

Tomostele, g. n., for *Achatina muscola*, Morelet ; Aucey, (5) p. 143.

Gnathophora.

Tryon, (358) p. 132, divides the *Gnathophora* into : (1) *Holognatha* = *Vitrina*, *Helix*, *Bulimus*, *Cylindrella*, *Pupa*, *Limax*, &c. ; and (2) *Elasmognatha* = *Succinea*. In the *Vitrinidæ* he includes the genera *Vitrina*, *Vitrinoidea*, *Vitrinopsis*, *Parmella*, *Vitrinoconus*, *Plutonia*, *Trigonochlamys*, which have no caudal mucous pore, and the following which have : *Damayantia*, *Laconia*, *Mariælla*, *Urocyclus*, *Parmarion*, *Aspidelus*, *Vitrinozonites*, *Velifera*, *Helicarion*. Under *Limacidæ* he includes *Limax*, 27 sp. (sections *Lehmannia*, 2 sp., *Ibycus*, 1 sp., *Agriolimax*, 9 sp., *Paralimax*, 2 sp., *Clyp-*

tropelta, 1 sp., *Krynickia*, 4 sp., *Megapelta*, 4 sp.), *Amalia*, 19 sp. (sect. *Sansania*, 10 sp., *Gigantomilax*, 1 sp., *Eumilax*, 1 sp.), *Parmacella*, 7 sp. (subg. *Cryptella*, 1 sp.), *Phosphorax*, 1 sp., *Oopelta*, 1 sp. *Limax* (s. str.) is made to include the following: *Heynemannia*, Malm, *Eulimax*, Moq.-Tand., *Stabilia*, *Chromolimax*, *Opilolimax*, *Gestroa*, Pini, *Limacus*, Lehmann, *Frauenfeldia*, Hazay. In *Tebennophoridæ*, Tryon places *Tebennophorus*, 3 sp. (section *Meghimatium*, 6 sp., and subg. *Pallifera*, 2 sp.), *Cystopelta*, 1 sp. *Arionidæ* (see p. 69) concludes the division.

Simroth (336) has made a detailed anatomical and biological investigation of the slugs of Germany. They may be arranged thus:—

I.—*Limax*. Slugs with 6 intestinal loops.

1. With 6 intestinal loops, but no cæcum (*Limax* proper).

L. maximus (*cinereo-niger*, *cinereus*, *unicolor*, *transsylvanicus*, *corsicus*, subg. *Doriæ*, var. *simplex*, var. *rubronotatus*, *montanus*).
L. tenellus.
L. nyctelius.
L. cærulans.

2. With 6 intestinal loops and a cæcum (*Lehmannia* or *Simrothia* ?).

L. variegatus (*ecarinatus*).
L. arborum ~~(var. *tigrina*~~, var. *dianæ*).

II.—*Agriolimax*.

A. agrestis (var. *florentinus*, var. *panormitamus*).
A. lævis.
A. melanocephalus.
A. dymczewiczi.
A. berytensis.
A. maltzani, sp. n.

III.—*Amalia*.

A. marginata.
A. carinata var. *sowerbyi*.
A. carinata.
A. gracilis (*budapestensis*).
A. gagates (*raymondiana*).
A. robici, sp. n.
A. cretica, sp. n.

IV.—*Paralimax*.

P. intermittens.

V.—*Arion*.

A. empiricorum.
A. brunneus (*subfuscus*).
A. bourguignati.
A. minimus, sp. n.
A. hortensis.

Definitions of the genera based on the anatomy are drawn up in a tabular form (pp. 252 & 253). In *Agriolimax*, a phylogenetic arrangement based on the extent of variation and geographical distribution would indicate *A. agrestis* and *A. lævis* as the most primitive forms, while anatomical considerations would point out *A. melanocephalus* and *A. dymczewiczi*. *Agriolimax* and *Amalia* originated in countries surrounding the Mediterranean; if they came thither from Asia it was probably by the south, from one peninsula to another. The best marked species of the latter appear to be *A. gagates*, *A. marginata*, *A. robici*, and *A. cretica*; the others may be regarded as merely local forms. The two last belong to the section *Malinastrum*, adopted for those forms which have no keel. *Limax* yields different classificatory results, according as these are based

the intestine or the genital organs; the radula has given such different results in the hands of different investigators that it may be left out of consideration. The author's conclusion is that *L. nyctelius* is the most direct descendant of the original stem-form, while *L. tenellus* has diverged in one direction, and *L. maximus*, *L. arborum*, and *L. variegatus* in another, the latter group being the most modified.

Limacidæ.

Agriolimax fungivorus, sp. n., Piedmont, Pollonera, (299) p. 678. *A. maltzani*, sp. n., S. Portugal, Simroth, (336) p. 225, pl. ix.

Amalia robici, Carinthia, *A. cretica*, Crete, spp. nn., *id. t. c.* pp. 230 & 231, pl. x.

Ariophanta kintana, *A. lahatensis*, spp. nn., Perak, de Morgan, (270) pp. 381 & 382, pl. vi. figs. 2 & 4.

Chilina parchappii, D'Orb., recorded from Arroyo Collon-gueyú, and figured by Doering, (104) p. 114, pl. ii. fig. 4.

Conulus sphæra, *C. filovinctus*, *C. cuneus*, *C. bifilaris*, *C. infracinctus*, *C. pyramis*, *C. petasus*, *C. sinensis*, spp. nn., China, Heude, (173) pp. 104–106, with figs.

Frauenfeldia, Hazay. Bœttger, (26) p. 68, points out that the name is preoccupied, but considers it allowable under all the circumstances.

Gœotis douvillei, sp. n., Perak, de Morgan, (270) p. 388, pl. viii. fig. 9.

Helicarion. Tryon (358) recognizes 92 species; many Australian species referred by Pfeiffer and others to *Vitrina*, *Mariælla*, &c., are here placed because Dr. Cox "states that all the Australian *Vitrinæ* have a caudal mucous pore."

Helicarion setchuanensis, *H. bulla*, *H. fargesianus*, *H. globus*, *H. poma*, *H. riparius*, *H. resinaceus*, *H. umbræcultor*, spp. nn., China, Heude, (173) pp. 100–102, with figs. *H. lowi*, sp. n., Perak, de Morgan, (270) p. 373, pl. v. fig. 3.

Hemiplecta leechi, sp. n., Perak, *id. t. c.* p. 379, pl. v. fig. 9.

Hyalinia (*Polita*) *polygyra*, *H.* (*P.*) *piniana*, *H.* (*Vitrea*) *craverii*, *H.* (*V.*) *bazzettæ*, spp. nn., *H.* (*V.*) *subhydatina*, n. n. (= *hydatina*, Less.), Piedmont, Pollonera, (299) pp. 680–682. *H. debettana*, sp. n., Vicentina, N. Italy, Adami, (1) p. 205, pl. i. figs. 1–3. *H.* (*Conulus*) *layardi*, sp. n., Vate, New Hebrides, Thomson (353). *H. crystallodes*, sp. n., China, Gredler (142A) p. 3. *H. oltisiana*, sp. n., S. France, Fagot (118A) p. 15. *H.* (*Zonites*) *harlei*, Catalonia, *H. arabiæ*, spp. nn., *id.* (118) p. 173.

Kaliella hongkongensis, *K. polygyra*, spp. nn., Hong Kong, v. Möllendorff, (264) p. 385, pl. x. figs. 13 & 14. *K. rupicola* var. *grandior*, n., Hoo-chew-foo, Gredler (142A) p. 4.

Lehmannia arborum var. *bettonii*, Sadelli, new to Britain; Roebuck (314).

Libera, g. n., for *Helix bursatella*; *L. gregaria*, *L. recedens*, spp. nn., Society Is.: Garrett (136).

Limax setchuanensis, sp. n., China, Heude, (173) p. 99, pl. xxvi. fig. 3. *L. canapicianus*, sp. n., Piedmont, Pollonera, (299) p. 677. *L. arborum* var. *maculata*, var. n., West Mayo, Ireland, Roebuck, J. of Conch. iv.

p. 375; *L. flavus* var. *suffusa*, var. n., *id. t. c.* p. 352. *L. maximus* ... *ferrussaci*, n., Cornwall, Belt, Zool. (3) ix. p. 389. *L. brasiliensis*, Semper, described with anatomy, and compared with *L. lævis*, America. *Limaces* compared with European, and regarded as probably imported; Jhering (202). *L. versicolor*, sp. n., Hungary, compared with and distinguished from *L. schwabi*, *L. cinereus*, &c.; Hazay, (165) p. 65. *L.* (*Heynemannia*) *maximus*, L., var. *ater*, Raz., new to Montenegro. *L.* (*Frauenfeldia*) *montenegrinus*, sp. n., South-west Montenegro: Bœttger, (26) pp. 65–68. The last is based on immature specimens; Simroth (338).

Macrochlamys? discus, sp. n., Hong Kong, v. Möllendorff, (264) p. 379, pl. ix. fig. 8*b*. *M. pataniensis*, *M. hâtchongi*, *M. iousoufi*, *M. bartoni*, spp. nn., Perak, de Morgan, (270) pp. 376–378, pl. v. figs. 5–8.

Microcystina? sinica, sp. n., Quangtung, v. Möllendorff, (264) p. 386, pl. x. fig. 15.

Microcystis stenomphala, sp. n., Hong Kong, *id. t. c.* p. 38[illegible] fig. 9. *M. schmackeriana*, v. Möll., figured, *t. c.* fig. 10. *M.* [illegible] *M. scalpta*, spp. nn., Society Islands, Garrett (136).

Moaria conica, g. & sp. nn., Senegal, Chaper, (72) p. 4[illegible] or *Simrothia*?).

Nanina buccata, *N. flavopurpurea*, *N. delavayana*, *N. fa*[illegible] (var. of *N. distorta*), *N. unica*, *N. sciadophila*, *N. derelicta*, spp. nn., China, Heude, (173) pp. 102–104, with figs. *N. japonica*, sp. n., Sengoku, Japan, v. Möllendorff, (262) p. 59; the first *N.* from Japan, near *N. indica*, Pfr. *N.* (*Hemiplecta*) *filicostata*, sp. n., Hainan, *id.* (264) p. 387.

Parmarion setchuanensis, sp. n., China, Heude, (173) p. 99, pl. xxvi. fig. 4.

Petasia bouryi, sp. n., Perak, de Morgan, (270) p. 383, pl. vi. fig. 3.

Trochomorpha assimilis, sp. n., Society Islands, Garrett (136).

Trochonanina subrugosa, *T. tahitensis*, spp. nn., Society Islands, *id. t. c.*

Vitrina. Tryon (358) recognizes 59 good species, some with rather numerous synonyms: *V. diaphana*, Drap., = *V. pellucida*, Voith, *Hyalina vitrea*, Studer, *Helix limacina*, Alten, *H. virescens*, Studer, *H. palliata*, Hartm., *V. albina*, Ziegler, *V. pegorarii*, Pollonera, *V. glacialis*, (Forbes?), Pollonera. *V. annularis*, Studer, = *Helix imputa*, Studer, *V. subglobosa*, Mich., *V. æmulans*, Ad., and *V. plicosa*, Bielz. *V. paulina*, sp. n., China, Heude, (173) p. 100, pl. xxv. fig. 10. *V. barnardii*, sp. n., Geilston, Johnston, P. R. Soc. Tasm. (1884), p. 219. *V. brevis* var. *bosniaca*, n., Central Bosnia, Bœttger, (26) p. 54.

Xesta malaouyi, sp. n., Perak, de Morgan, (270) p. 374, pl. v. fig. 4.

Zonites mooreanus, sp. n., Society Islands, Garrett (136). *Z. scrobiculatus*, sp. n., Hanan, Gredler, (142) p. 220, pl. vi. fig. 2. *Z. nitidulus* var. *helmii*, from S. Tipperary; Taylor, J. of Conch. iv. p. 352. *Z.* (*Hyalina*) *minusculus*, Binney, synonymy discussed by Dall, (97) p. 270. *Z.* (*Hyalina*) *radiatulus*, Alder, ranges from Florida to Ungava and Point Barrow; *id. t. c.* p. 269.

Helicidæ.

Anceyia, g. n. Resembling *Clausilia*, with columella and oral fold, but without clausilium, with high *Scalaria*-like ribs, mouth with a sinus above

below ; *A. giraudi*, sp. n., Tanganyika, Bourguignat, (41 A) pp. 14 & 15.

The family *Arionidæ* contains, according to Tryon (358), *Arion* (sections *Lochea*, 3 sp., *Carinella*, 1 sp., *Prolepis*, 4 sp., *Baudonia*, 1 sp., *Ariunculus*, 5 sp.), *Geomalcus*, 2 sp. (subg. *Letourneuxia*, 1 sp.), *Ariolimax*, 5 sp., *Hemphillia*, 1 sp., these have no mucous pore ; the remainder, which have, are *Anadenus*, 3 sp., *Prophysaon*, 1 sp., *Cryptostracon*, 1 sp.

Arion is divided into two groups (*Monatriidæ* and *Diatriidæ*) according as the lower portion of the genital passage remains the sole part common to the two sets of organs or forms in addition a second dilatation (egg-sac). Thus :

Monatriidæ.	Diatriidæ.
A. minimus.	*A. empiricorum.*
A. subfuscus.	*A. hortensis.*
Chilina parumbrunneus.	*A. timidus.*
figured by Doer	*rguignati.*

pp. 381 &

Conulus sphæ

mis, C.

is further borne out by the coloration of the various species, and by what is known of their distribution. Simroth (336).

Arion minimus, sp. n., Central Germany, near Leipzig, *id. t. c.* p. 237, pl. xi. figs. 14 & 15. *A. brunneus* united with *A. subfuscus* ; *id. t. c.* p. 280. *A. ater* var. *reticulata*, var. n., Ireland, Roebuck, J. of Conch. iv. p. 375 ; var. *bicolor*, Cornwall, Belt, Zool. (3) ix. p. 389. *A. pollonerœ*, sp. n., Piedmont, Pini, (289) p. 381, pl. xii. *A.* (*Lochea*) *stabilei*, *A.* (*Carinella*) *subcarinatus*, spp. nn., Piedmont, Pollonera, (299) p. 700. *A. souerbieui*, sp. n., S. France, Fagot, (118A) p. 14.

Bulimus nasutus, sp. n., Brazil, v. Martens, (256) p. 191. *B. grandis*, sp. n., Brazil, *id.* (254) p. 148. *B. ilgi*, *B. chefneuxi*, *B. soleilleti*, spp. nn., Shoa, Bourguignat, (39) pp. 11–14, fig. 5. *B. girardi*, *B. reymondii*, spp. nn., Tanganyika, *id.* (41A) pp. 12 & 13. *B.* (*Placostylus*) *cleryi*, Petit, dimensions and sculpture, San Christoval, Solomon Islands ; E. A. Smith, (343) p. 595. *B. acutus*, British distribution of ; Naturalist, x. pp. 112, 181, & 366.

Cochlostyla. Von Möllendorff (263) points out that of 240 species enumerated by Semper & Pfeiffer, only 87 are placed by both in the same subdivision ; a list of species, with their classification according to both authors, is given.

Curvella, g. n. Shell thin, conical, without umbilicus, shining, whorls 5–6, outer margin prominent in the middle, retreating below ; columellar margin slightly emarginate ; *C. sulcata*, *C. inornata*, spp. nn., Assinie, Chaper, (72) pp. 48 & 49, pl. i. figs. 10 & 11. *C. striata* and *C. inornata*, Chaper, identical with *Bulimus* (*Hapalus*) *khasianus* and *B.* (*H.*) *munipurensis*, Godwin-Austen ; Jousseaume, (207) p. xxii.

Endodonta cretacea, sp. n., Society Is., Garrett (136).

Eudioptus aguirrei, sp. n., Argentine Republic, Doering, (104) p. 112, pl. ii. fig. 2.

Glessula bretignerei, sp. n., Assinie, Chaper, (72) p. 46, pl. i. fig. 6.

Hapalus jousseaumi, sp. n., Perak, de Morgan, (270) p. 372, pl. v. fig. 2.

Helicopsis tabulæ, sp. n., Table Mountain, Cape Town, Chaper, (5) p. 483, pl. xi. figs. 4 & 5.

Helix. Dohrn (106) continues his account in Küster's Conch. Cab. : 24 species (none new).

Helix. European species :—

Helix sericea, Müll. : anatomy ; Ashford (7). *H. pisana* var. *alba*, Co. Dublin, Cockerell, J. of Conch. iv. p. 368. *H. ericetorum*, Llandudno, *id. t. c.* p. 373. *H. arbustorum* varr., Woodward (380). *H. nemoralis* var., Scott, P. N. H. Soc. Glasg. v. p. 308 : perhaps *albo-labris* ; Crowther, (Sci. Goss., Jan. 1883). *H. unifasciata*, Poiret, = *H. candidula*, Studer, former name preferred ; the 18 allied species divided into groups according to the umbilicus; *H. microphana*, *H. garocéliana*, *H. tarasconensis*, *H. elimberrisiana*, *H. arelatensis*, described as new : Locard, (238) ix. *Helix* spp., Bellegarde ; Austant, Le Nat. vii. pp. 115 & 116. *H. constricta*, Granger, *t. c.* p. 100 [see also *id.* Act. Soc. L. Bord. (4) ix. p. xxxviii.]. *H.* (*Xerophila*) *sulliottii*, sp. n., Piedmont, Pollonera, (299) p. 699. *H.* (*Trichia*) *cottiana*, *H.* (*T.*) *salassia*, *H.* (*T.*) *pegorarii*, spp. nn., Piedmont, *id. t. c.* p. 695. *H. blanci*, sp. n., N. Italy, *id.* (297) p. 78. *H. liburnica*, Stossich, *H. gyroides*, Parreyss, synonymy of ; Brusina (57). *H.* (*Xerophila*) *homoleuca*, Parreyss : synonymy ; *id. t. c.*, and (55). *H.* (*Zenobia*) *saxigaga* and *H. cynetarum*, spp. nn., Algarve ; Maltzan, (247) p. 235. *H. quadrasi*, sp. n., Valentia, Spain, near *H. constricta* and *H. paludosa* ; Hidalgo, (180) p. 193, pl. ix. fig. 6. *H. quimperiana*, Fér. : genital organs described, and species referred to a special subgenus, *Elona*, Adams ; Hesse (168). *H.* (*Campylæa*) *serbica*, v. Moll., var. *unitæniata*, new to Montenegro ; Bœttger. (26) p. 69. *H.* (*Campylæa*) *argentellei*, Kob., var. *peritricha*, n. ; *H.* (*C.*) *conemenosi*, sp. n., Greece : *id.* (30) p. 120. *H.* (*Xerophila*) *nikitai*, sp. n., Cettinje, Montenegro, Clessin, (82) p. 180.

Helix. Asiatic species :—

Helix dichrozona, *H. lentina*, Ferghana, spp. nn., v. Martens, (251) p. 17. *H. leprosa*, *H. latrunculorum*, *H. improvisa*, *H. conrauxiana*, *H. laciniosa*, *H. demolita*, *H. innominata*, *H. delavayana*, *H. parasitica*, *H. parasitarum*, *H. sedentaria*, *H. calculus*, *H. furtiva*, *H. herpestes*, *H. mola*, *H. impatiens*, *H. magnaciana*, *H. seguiniana*, *H. biforis*, *H. invia*, *H. reserata*, *H. murata*, *H. diodontina*, *H. biscalpta*, *H. rebellis*, *H. padullella*, *H. pulverulenta*, *H. puberula*, *H. aranceatela*, *H. horripilosella*, spp. nn., China, Heude, (173) pp. 106–114, with figs. *H. he[illegible]quris*, sp. n., Badung, China, v. Möllendorff, (265) p. 166. *H.* (*G.*) *diplomphala*, *H.* (? *G.*) *binodata*, spp. nn., Badung, China, [illegible]nt Barrow ; pp. 165 & 166. *H. platyomphala*, *H.* (*Hadra*) *subgibbera*, sp[illegible] Quangtung, *id.* (264) pp. 392–394, pl. xi. figs. 9 & 21. *H.* (*Plectotro[illegible]*) *hupensis*, E. Hoopé, *H. piligera*, Queichow, spp. nn., Gredler, (142) pp. 221 & 222, pl. vi. figs. 1 & 3. *H. leprosula*, Heude, = *H. leprosa*, Heude, *nec* Shuttlew. ; *H. laciniosula*, Heude, = *H. laciniosa*, Heude, *nec* Lowe ; *H. lithina*, Heude, = *H. calculus*, Heude, *nec* Lowe ; *H. puberosula*,

= *H. pulverulenta*, Heude, *nec* Lowe: Heude (44). *H. similaris*, Fér., Yeso, Poronai, most northerly locality known; v. Möllendorff, (262) p. 60.

Helix. African species:—

Helix (*Xerophila*?) *laurinæ*, sp. n., Tunis, near *H. cantæ* and *H. tiranoi*, Issel, (193) p. 6. *H.* (*Numidia*) *idia*, Bourg. & Letourn., figured; *id. t. c.* p. 8. *H. d'hericourtiana*, sp. n., Shoa, Bourguignat, (39) p. 10, figs. 8 & 9. *H. indecorata*, Gld., from Landana, Mouth of Congo, figured by Morelet, (268) p. 20, pl. ii. fig. 6.

Helix. American species:—

Helix (*Hemitrochus*) *filicosta*, Pfr., Bahamas: habitat hitherto unknown; Thompson (355). *H.* (*Polygyra*) *cereolus*, Muhlfeld, four chief forms (*septemvolva*, *laminifera*, *microdonta*, *cereolus*) distinguished by Dall, (97) p. 266. *Helix* (*Microphysa*) *vortex*, Pfr., "said to be viviparous"; *id. t. c.* p. 268.

Helix. Polynesian species:—

Helix (*Videna*) *sanctæannæ*, Santa Anna, Solomon Is., *H.* (*Nanina*) *nitidissima*, Treasury I., Bougainville Strait, *H.* (*N.*) *solidiuscula*, Santa Anna Is., *H.* (*Geotrochus*) *guppyi*, Faro I., Bougainville Straits, spp. nn., E. A. Smith, (343) pp. 589–594, pl. xxxvi. figs. 1, 2, 4, & 7. *H.* (*Camæna*) *hombroni*, Pfr., not from Admiralty Is., as originally stated, but from Solomon Is.; *id. t. c.* p. 594.

Janella, *Aneitea*, *Athoracophorus*, and *Triboniphorus*: history of the genera briefly reviewed, with critical remarks; Heynemann, (178) pp. 306–308.

Ochroderma, g. n., for *Tornatellina gigas*, Marts.; Ancey, Le Nat. vii. p. 93.

Oxytes sakaya, sp. n., Perak, de Morgan, (270) p. 380, pl. vi. fig. 1.

Parmacella valenciennesi, Webb & v. Ben., not *P. deshayesi*, found near Malaga; Hidalgo (179): observations on oviposition by Crosse (89). *P. valenciennii*, *P. deshayesii*, and *P. dorsalis*, regarded as probably identical on the basis of anatomical examination; Simroth (339).

Partula, Fér., is subdivided by Hartmann, (162) p. 206, into an Auriform and a Buliminoid division, the former containing 11 groups and 61 species, while the latter contains 2 groups and 14 species. The following are described as new:—*Partula magdalinæ*, Magdalena I., Marquesas, *P. b*[illegible]inie, u, Wapo I., Marquesas, *P. tryoni*, Solomon Is., *P. flexuosa*, *inornata* ge and Eddystone Is., Solomon Is., *P. glaber*, hab.?; *P.* (*H.*) *m*[illegible]*ria* (Pfr.) is a misnomer, the shell being found at Raiatea, E[illegible]y Is., and not Navigator Is.; the name *P. variabilis*, Pse., should th[illegible]efore be retained for the species. *P. taniata* (Mörch): hab., Fiji Is. (Mörch) probably erroneous; *id. t. c.* pp. 203–208 & 215, cuts.

Patula acuticosta, *P. lamellicosta*, spp. nn., Society Is., Garrett (136). *P. holmbergi*, sp. n., Argentine Republic, Doering, (104) p. 113, pl. ii. fig. 3. *Spelæodiscus*, subg. n., for *P. haufferi*, Schmidt; Brusina, (56) p. 11.

Perideris verdieri, sp. n., Senegal, Chaper, (72) p. 45, pl. i. fig. 5[48].

Philidora wrayi, *P. hardouini*, spp. nn., Perak, de Morgan, (270) pp. 384 & 385, pl. vi. fig. 5, & pl. v. fig. 10.

Pityx consobrina, *P. subtilis*, *P. punctiperforata*, *P. boraborensis*, spp. nn., Society Is., Garrett (136).

Plectopylis diptychia, sp. n., Queichow, v. Möllendorff, (264) p. 390, pl. x. fig. 17; *P. laminifera*, *P. stenochila*, spp. nn., Badung, China, *id.* (265) p. 161.

Rhodina, g. n. Near *Rhodea*; without a keel on the last whorl; mouth triangular; for *R. perakensis*, sp. n., Perak; de Morgan, (270) p. 390, pl. vi. fig. 9.

Solaropsis cousinii, sp. n., Basin of the Napo, Jousseaume, (207) p. xxii.

Trichia. List of species from Württemberg; Krimmel (217), and Math. Nat. MT. ii. pp. 73–77.

Zua locardi, sp. n., Piedmont, Pollonera, (299) p. 693.

[illegible] xvii.

[illegible]minal gill like [illegible]l gill; penis of

PUPIDÆ.

Buliminus (*Mastus*) *unius*, Unia I., *B.* (*Zebrina*) *c*[illegible], Greece, Smyrna, *B.* (*Mastus*) *milensis*, I. of Milo, *B.* (*Ena*) *stokesii*, Amorgo I., *B.* (*E.*) *carpathius*, Carpatho I., spp. nn., Bœttger, (33) pp. 23–26. *B.* (*E.*) *cefalonicus*, Mouss., var. *conemenosi*, n.; *id.* (30) p. 121. *B.* (*E.*) *ossicus*, sp. n., and var. *discolor*, summit of Mount Ossa, Thessaly, var. in Vale of Tempe, and cave in Ossa; *id.* (347) p. 180, pl. iv. fig. 9: *B.* (*Chondrula*) *quadridens* (Müll.) var. *planilabris*, Mount Ossa; *id. t. c.* p. 183, pl. iv. fig. 13. *B. montanus*, Drap., and 5 varr.; Clessin (81). *B. detritus*, Müll., described, and its varieties enumerated; *id.* (79). *B. micelii*, sp. n., Tunis, Kobelt, (213) p. 115. *B. onychinus*, *B. fargesianus*, *B. aubryanus*, *B. pinianus*, *B. huananensis*, *B. secalinus*, *B. avenaceus*, *B. setchuanensis*, *B. delavayanus*, *B. squammosulus*, spp. nn., China, Heude, (173) pp. 114–116, with figs. *B.* (*Chrondula*) *heptodon*, sp. n., Egypt, v. Martens, (252) p. 88. *B. andersonianus*, Onuma, *B. japonicus*, Osaka, Japan, spp. nn., v. Möllendorff, (262) pp. 60 & 61.

Buliminus. Genital organs of 5 species described by Hesse (169).

Clausilia (*Pirostoma*) *pegorarii*, *C.* (*P.*) *sulliottii*, spp. nn., Piedmont, Pollonera, (299) pp. 691 & 692. *C. paulucciana*, n. n. (= *C. diodon*, Lessona), *C. bernardensis*, sp. n., *C. hospitiorum*, sp. n., *C. lurida*, sp. n., *C. selliana*, sp. n., *C. lata*, sp. n., from Piedmont or surrounding districts; *id.* (298) pp. 411–422, figs. 1, 5, 6, 10, 11, 14, & 20. *C. dubia*, Drap., var. *gobanzi* (Parr.), Pfr., redefined, probably a distinct species; Tschapeck (359). *C.* (*Delima*) *umbilicata*, Bttg., new to Dalmatia; Bœttger, (26) p. 71. *C.* (*Papillifera*) *stussineri*, sp. n. & var. minor, Mt. Ossa, Thessaly, *id.* (347) p. 189, pl. iv. fig. 11. *C.* (*Albinaria*) *torifera*, sp. n., Kouveltoi, Thessaly, *id. t. c.* p. 191. *C.* (*Evalopia*) *kiakelini*, sp. n., Upper Oligocene, Offenbach, *id.* (29) p. 116. *C.* (*Albinaria*) *conemenosi*, Bttg., var. *macrodera*, n., *C.* (*A.*) *achaica*, sp. n., Greece, *id.* (30) p. 122. *C. balsamoi* var. *liesenhauseni*, n., Gredler (141). *C.* (*Hemiphædusa*) *gastroptychia*, sp. n., Queichow, v. Möllendorff, (264) p. 397, pl. xi. fig. 24. *C.* (*H.*) *laurentiana*, *C.* (*H.*) *franciscana*, *C.* (*Macrophædusa*) *gigas*, *C.* (*M.*) *par-*

...rascens, *C.* (*Garnieria*) *trachelostropha*, spp. nn., Badung, China, v. Möllendorff, (265) pp. 167–169. *A. praba*, A. Ad., not from Utsonoma and Mamada, Japan, but *C. tau*, Böttg.; *id.* (262), p. 61. *C. tetraptyx*, v. Möllf., not to group of *C. calidiuscula*, but of *C. brevior*; *id. ibid.* *C. nikkoensis*, *C. sublunellata*, *C. opeas*, spp. nn., Nikko, Japan, *id. t. c.* pp. 62 & 64. *C. martensi*, Herkl., *C. reiniana*, Kobelt, *C. yocohamensis*, Crosse, and var. *reiniana*, Böttg., probably identical; *id. t. c.* p. 62. *C. fusangensis*, v. Möllf., = *C. platyauchen*, v. Mart.; *id. t. c.* p. 65. *C. ardouiniana*, *C. decurtata*, *C. fargesiana*, *C. fargesianella*, *C. delavayana*, *C. vincotiana*, *C. artifina*, *C. segviniana*, *C. fuchsiana*, *C. longispina*, *C. antilopina*, *C. bisdelineata*, *C. janseniana*, *C. acanthula*, *C. aplostoma*, spp. nn., China, Heude, (173) pp. 118–122. *C.* (*Siciliaria*) *brugnoneana*, sp. n., Sicily, Pini, (289) p. 379, pl. xii. *C.* (*Marpessa*) *ligurica*, *C.* (*M.*) *silensis*, spp. nn., Piedmont, *id. op. cit.* pp. 246–248.

Pedemontiana, sect. n. "Testa nitida aut nitidula corneo-lutescens vel corneo-rufescens, ventricosa, crassa, striis obsoletis regulariter ornata, lunella debilis subcurvata aut imperfecta, plicæ, palatales, 2 superæ, prima valida, elongatiuscula, altera brevis a supera disjuncta sed satis approximata: Clausilium integrum, lamella spiralis a supera disjuncta." Contains *Clausilia baudii*, *C. doriæ*, spp. nn., Pini, (289) pp. 242–245, and *C. studeri*, *id. t. c.* p. 376, pl. xii.

Pseudonenia kapayanensis, sp. n., Perak, de Morgan, (270) p. 391, pl. vi. fig. 8.

Pupa tatrica, sp. n., Kotlina Valley, Hohe Tatra, Hazay, (161) p. 32. *P.* (*Boysidia*) *strophostoma*, sp. n., and var. *conspicua*, Quangtung; v. Möllendorff, (264) p. 395, pl. xi. fig. 23. *P.* (*Gibbulina*) *comorensis*, sp. n., Comoro Is., Morelet, (269) p. 293, pl. xiv. fig. 3. *P. valsabina*, Spinelli, discussed and characterized; *P. biplicata*, Mich., and *P. megacheilos*, Jan., var. *bigorriensis*, Charp., annotated by Gredler (143). *P. polloneræ*, Pini, = *P. gularis* var. *spoliata*, Rossm.; *id. t. c.* p. 38.

Pupilla floridana, sp. n., Dall, (97) p. 261, pl. xvii. fig. 11, Archer, Alachua County, Florida; related to *P. pentodon* and *P. pellucida*.

Torquilla blanci, sp. n., Piedmont, Pollonera, (299) p. 688.

Triptychia recticosta, Bttg., fully described; Boettger (29).

Vertigo (*Isthmia*) *monodonta*, sp. n., Piedmont, Pollonera, (299) p. 685.

Stenogyridæ.

Achatina (*Homorus*) *monacha*, sp. n., Comoro I., Morelet, (269) p. 290, pl. xiv. fig. 7. *A. milne-edwardsiana*, sp. n., Somali-land, Revoil, (309) p. 38, pl. v.

Cæcilianella soleilleti, sp. n., Shoa, Bourguignat (39), p. 22, fig. 10. *C. pedemontana*, sp. n., Po, near Turin, Pollonera, (299) p. 693.

Limicolaria d'hericourtiana, *L. choana* (= *Achatina heuglini* var. β, v. Mart.), *L. pyramidalis*, *L. chefneuxi*, *L. glandinopsis*, *L. soleilleti*, spp. nn., Shoa, Bourguignat, (39) pp. 15–21, figs. 20–23. *L. droueti*, sp. n., Landana, Mouth of Congo, Morelet, (268) p. 21, pl. ii. fig. 14. *L. æthiops*, sp. n., Gaboon, *id. t. c.* p. 23, pl. ii. fig. 13.

Stenogyra tchchelensis, *S. swettenhami*, spp. nn., Perak, de Morgan, (270)

pp. 388 & 389, pl. vi. figs. 7 & 6. *S. fuchsiana*, *S. aubryana*, *S. utricu*[illegible] *S. fargesiana*, *S. fauveliana*, *S. setchuanensis*, spp. nn., China, Heude, (173) pp. 117 & 118, with figs. *S. invalida*, Gaboon (= *Achatina decollata*, Morelet), *S. normalis*, Landana, *S. gracilenta*, *S. achmella*, *S. recisa*, Mayumba, *S. saxatilis*, *S. plebeia*, Landana, Mouth of Congo, spp. nn., Morelet, (268) pp. 23–28, pl. ii. figs. 1–5, 7, 8, & 15. *S. terebellæ*, *S. canarica*, *S.* (*Opeas*) *longula*, *S.* (*O.*) *apiculum*, spp. nn., Comoro Is., *id.* (269) pp. 290–292, pl. xiv. figs. 1, 8, & 9.

Succineidæ.

Succineidæ of Palæarctic Region, Westerlund, (377) pp. 13–16; many varr. nn., no sp. n.

Succinea simplex, Pfr., var. from Solomon Is., E. A. Smith (313) p. 595; *S. fargesiana*, sp. n., China, Heude, (173) p. 123, pl. xxxi. fig. 18; *S. meneliki*, *S. chefneuxi*, *S. soleilleti*, spp. nn., Shoa, Bourguignat, (39) pp. 8–10, fig. 4; *S. bofilli*, sp. n., Catalonia, Fagot, (118) p. 171.

Vaginulidæ.

Vaginula. Colour to be used in determining species, not surface, presence of ridges, furrows, or the like; criticisms on previous descriptions; present author begins with colour of upper surface, then general form of body, with measurements; body surface, and genital and anal openings; notes and descriptions of 23 species from Africa:—*V. verrucosa*, *V. margaritifera*, *V. sulfurea*, spp. nn., Madagascar; *V. elegans*, *V. tristis*, spp. nn., Seychelles: Heynemann, (177). *V. angustipes*, *V. aberrans*, spp. nn., S. America, *id.* (178) pp. 276 & 277. *V. adspersa*, sp. n., Chili, *id. t. c.* p. 282. *V. chinensis*, Möllendorff, redescribed; *id. t. c.* p. 301. *V. stuxbergi*, Westerlund, probably an *Onchidium*; *id. t. c.* p. 303. *V. fusca*, Rio Janeiro, *V. nigra*, Chili, *V. maura*, Delagoa Bay, S. Africa, *V. picta*, *V. grossa*, Comoro Is., *V. bicolor*, Seychelles, *V. flava*, Borneo, spp. nn., with remarks on other species; *id.* (175). *V. cærulescens*, Caracas, *V. mexicanus*, Mexico, *V. decipiens*, Chili, *V. dubia*, St. Thomas, *V. bielenbergii*, S. America, Puerto Cabello, *V. punctatissima*, Porto Rico, St. Thomas Trinidad, *V. immaculata*, Caracas, Puerto Cabello, *V. kriedelii*, hab. ?, *V. portoricensis*, Porto Rico, *V. galatheæ*, Montevideo, *V. boettgeri*, Brazil, *V. variegata*, Brazil, *V. ligulæformis*, Guayaquil, *V. multicolor*, Buenos Ayres, *V. telescopium*, ? S. America, *V. behnii*, Rio Janeiro, *V. lamellata*, Rio Janeiro, *V. marginata*, Rio Janeiro, *V. kjelleruplii*, Bahia, *V. krögeri*, La Plata, *V. martensii*, Rio Janeiro, *V. koellikeri*, E. Africa, *V. mörchii*, Guadeloupe, *V. trilineata*, Mauritius, *V. andreana*, Mauritius, *V. idæ*, Borneo, *V. reinhardtii*, Macao, *V. zamboangensis*, Zamboanga, *V. frauenfeldi*, Madras, *V. voigtii*, hab. ?, spp. nn., Semper (332). *V. boetzkesi*, Mill., = *V. complanata*, Mill.; *V. arcuata*, Mill., = *V. teres*, Mill.; *V. andensis*, Mill., = *V. cephalophora*, Mill., = *V. quadrocularis*, Mill., = *V. limayana*, Lesson (?); Hesse (171). *V. fargesianus*, *V. patriatianus*, spp. nn., Hong Kong, Heude, (173) p. 99, pl. xxvi. fig. 2.

RATHOUISIIDÆ, fam. n.

Rathouisiidæ, fam. n., for *Rathouisia*, g. n. ; characterized by the entire absence of a jaw, which is replaced by a suctorial proboscis ; for *R. leonina* = *Vaginula sinensis*, Heude ; also *R. tigrina*, China, Heude, (173) pp. 99 & 100, pl. xxvi. fig. 1. Notes on the habits of the genus by Rathouis, *t. c.* pp. 131 & 132.

ONCHIDIIDÆ.

Bergh (15), from anatomical examination of several species, finds that the *Onchidia* resemble the Pulmonates in the structure of the nervous system, the presence of a lung, of a parenchymatous kidney, of the peculiar foot-gland, as well as in the relations of the genital organs ; they are thus not Nudibranchs, but Pulmonates, which have become adapted to an amphibious or marine life. Bergh's view is opposed by von Jhering ; Z. wiss. Zool. xli. p. 259.

Onchidium floridanum, sp. n., Knight's Key, Dall, (97) p. 288.

Onchidella campbelli, sp. n., Campbell I., Filhol, (122) p. 521.

BASOMMATOPHORA.

The group divisible thus :—

1. *Limnophila.*
2. *Akteophila.* *Auriculidæ.* Subfams. *Auriculinæ.* *Melampinæ.*
3. *Pterophila.* *Siphonariidæ.* *Gadiniidæ.* *Oncidiidæ.* *Corbiculidæ.*
4. *Thalassophila.*

Dall, (97) p. 274.

GEHYDROPHILA.

AURICULIDÆ.

Dall remarks on the nomenclature and classification of the family, and enumerates the species from the Eastern United States ; (97) p. 274. 10 species recorded from China ; v. Möllendorff (264).

Blauneria heteroclita (Montague) figured by Dall, (97) pl. xvii. fig. 6.

Carychium. 8 Palæarctic species described (none new) ; Westerlund, (377) pp. 17–19.

Cassidula plecotrematoides, sp. n., Hong Kong, v. Möllendorff, (264) p. 352, pl. ix. fig. c ; *C. schmackeriana*, sp. n., Hong Kong, *id. t. c.* p. 354.

Ellobium penangense, sp. n., Pulo Penang, de Morgan, (270) p. 396, pl. viii. fig. 11.

Leuconia sinica, sp. n., Macao, v. Möllendorff, (264) p. 356.

Melampus crossei, sp. n., Pulo Penang, de Morgan, (270) p. 393, fig. 10.

Mousssonia apicina, sp. n., Queichow, Gredler, (142) p. 229.

Pedipes elongatus, sp. n., Dall, (97) p. 279, pl. xviii. fig. 4, Marco, Florida.

Plecotrema minuta, sp. n., Hong Kong, v. Möllendorff, (264) p. 351, pl. ix. fig. B.

Pythia fimbriosa, sp. n., Macao, Hainan, *id. t. c.* p. 349, pl. ix. fig. A. *P. scarabæus*, L. : *P. insularis*, Hombron, referred to this by E. A. Smith, (343) p. 599.

Sayella, subg. n., Dall, (97) p. 286 ; for *Leuconia hemphillii*, Dall. *S. hemphillii*, Cedar Keys, Florida, *S. crosseana*, sp. n., Florida, *id. t. c.* pl. xviii. fig. 10.

Tralia (*Alexia*) *myosotis* (Drap.) : synonymy ; *id. t. c.* p. 277.

HYGROPHILA.

Limnæidæ.

Ancylus fluviatilis var. *costata*, *Pupa marginata* var. *brevis*, new to Britain ; J. of Conch. iv. p. 376. *A. sibiricus*, Gerstf., *A. troschelii*, and *A. renardii*, described and figured by Dybowski (111).

Bulinus mœsta, Adams, radula figured by Hutton, (192) pl. xii. fig. 12.

Choanomphalus treated by Clessin (76).

Fossaria, subg. n. ; for *Limnæus truncatulus* (Müll.) ; Westerlund, (377) pp. 24 & 49.

Limnæa. Palæarctic species enumerated and subdivided ; 6 subgg., one new [see above], many varr. nn. : *id. t. c.* *L. prisca*, sp. n., Sweden, subfossil, *id. t. c.* p. 36. *L. hydrobia*, sp. n., Bavaria, Carinthia, *id. t. c.* pp. 36 & 52. *L. palmeri*, Dall. (Am. J. Conch. vii. p. 135, 1871) = *Recluzia palmeri* ; Dall, (97) p. 274. *L. pictonica*, Picton I., Patagonia, sp. n., Rochebrune & Mabille, (313) p. 111. *L.* (*Amphipeplea*) *arguta*, *L.* (*A.*) *ampulla*, *L. leptosoma*, *L. tenella*, *L. pucilla*, spp. nn., New Zealand, Hutton (192). *L. glabra*, presence of, near Lübeck ; P.-v. Soc. mal. Belg. [1883], pp. cxxvi. & cxxvii. *L. ievoluta*, Thompson, not found in the recorded locality ; Bendall, J. of Conch. iv. p. 349 ; found by Evans, *t. c.* p. 355. *L. gravieri*, *L. soleilleti*, spp. nn., Shoa, Bourguignat, (39) pp. 23 & 34, figs. 6 & 7. *Limnæa*, description of the radula of ; Dybowski (112) : remarks on respiration of in deep water ; Forel, (133) p. 196.

Planorbis strictus, Central America ?, *P. pauxispiratus*, *P. solidulus*, hab. ?, *P. hindu*, India, spp. nn., Clessin, (76) pp. 223 & 224, pl. xxxiii. figs. 4, 8, 10, & 9. *P. polaris*, n. n., = *P. borealis*, v. Martens ; Westerlund, (377) p. 79. *P. ancylus*, sp. n, Tyrol, *id. op. cit.* p. 83. *P. filaris*, sp. n., Hooman, Gredler, (142) p. 225. *P. sampsoni*, sp. n., Ancey, Missouri, Sampson, (320) p. 25. *P. corinna*, Gray, figured by Hutton, (192) pl. xii. fig. 6. *P. umbilicatus*, sp. n., Manitoba, Taylor (351) and Christy (75). *P. subangulatus*, Phil., from Malta ; Cockerell, J. of Conch. iv. p. 366.

Pompholyx treated by Clessin (76).

PHYSIDÆ.

Physa. 122 species enumerated by Clessin (76, 77); the following described as new: *P. obtusa*, Honduras, p. 292, pl. xlii. fig. 5, *P. hjarmarsoni*, Honduras, p. 293, pl. xlii. fig. 6, *P. stollii*, Guatemala, p. 293, pl. xlii. fig. 11, *P. smithi*, Australia, pl. xlii. figs. 2 & 3. *P. achajæ*, sp. n., Greece, Westerlund, (377) p. 57.

Physopsis soleilleti, *P. meneliki*, spp. nn., Bourguignat, (39) pp. 25 & 26, fig. 11.

OPISTHOBRANCHIATA.

NUDIBRANCHIATA.

KLADOHEPATICA.

PHYLLIROIDÆ.

Phylliroe (*Eurydice lichtensteinii*?), lat. 36°, long. 135° W.; Krause, (216) p. 300.

HERMÆIDÆ.

Hermæa dendritica, Ald. & Hanc., Atlantic and Mediterranean: external form and anatomy described; Bergh, (16) pp. 4–12, pl. i. figs. 1–16, pl. ii. figs. 1–12, pl. v. fig. 6.

Stiliger mariæ (Mey. & Moeb.), Trieste: similar descriptions; *id. t. c.* pp. 13–18, pl. ii. fig. 13, pl. iii. figs. 1–10, pl. iv. figs. 1–7.

ELYSIIDÆ.

Elysiella catula (Agassiz, Gould, *Placobranchus*), Atlantic: external form and anatomy described; *id. t. c.* pp. 19–22, pl. i. figs. 17–19, pl. iii. fig. 15, pl. iv. figs. 8–11, pl. v. figs. 1 & 2.

Thuridilla splendida (Grube), Adriatic: notes on anatomy; *id. t. c.* pp. 22 & 23, pl. v. figs. 3–5.

ÆOLIDIIDÆ.

Æolidiella glauca (Ald. & Hanc., *Eolis*) and var. *mediterranea*, N. Atlantic (Liimfjord, Torbay): external form and anatomy described; *id. t. c.* pp. 24–28, pl. iv. fig. 17, pl. v. figs. 12–14, pl. vi. fig. 8, pl. vii. figs. 3–5.

Æolis rubicundus, sp. n. (nomen tantum), Wagner (373).

Amphorina moliosa (Herdman) anatomically examined; Bergh, (16) pp. 39–41.

Coryphella stimpsoni, Verrill, anatomy of; *id. t. c.* pp. 54–56, pl. v. fig. 15.

Cratena pilata (Gould, *Æolis*) and *C. gymnota* (Couth.), W. Atlantic: external form and anatomy: *id. t. c.* pp. 31–33, pl. iv. figs. 13–16, pl. v. fig. 16, pl. vi. fig. 11, pl. vii. figs. 10–13.

Embletonia pallida, Ald. & Hanc., Atlantic: external form and anatomy; *id. t. c.* pp. 36–39, pl. ii. figs. 14–19, pl. iii. figs. 11–13, pl. iv. fig. 12, pl. v. fig. 7.

Facelina vicina, Bgh., *F. bostoniensis* (Couth.), and *F. mœsta*; [illegible] anatomically examined; *id. t. c.* pp. 44–46, pl. vi. figs. 12 & 13, pl. vii. figs. 14 & 15.

Favorinus versicolor, Costa, remarks on; *id. t. c.* pp. 41 & 42.

Flabellina affinis (Gm.), notes on; *id. t. c.* pp. 51 & 52.

Govia, g. n. Body elongated, as in *Eolidiidæ*; head with four or five digitiform marginal papillæ; dorsal papillæ in a single series along the margins, and armed with smaller shorter triangular papillæ; no cnidophorous sac, cnidocysts on the convex aspect of the dorsal papillæ. Mandibles with short masticatory process, with a single row of teeth, three anterior smooth, others with minute tubercles. Radula triseriate; anal papillæ laterodorsal; renal cellules scattered in the dorsal integument; genital papilla with two openings; penis short, conical, unarmed; cerebral ganglia fused with visceral; rhinophores perfoliate. For *G. viridis*, *G. rubra*, spp. nn., Bay of Naples; Trinchese (357).

Spurilla neapolitana (d. Ch.) var., Trieste: notes on appearance and anatomy; Bergh, (16) p. 29.

Tritoniidæ.

Adalaria sibirica, sp. n., N. Siberia, Aurivillius, (9) p. 372, pl. xiii. fig. 19. *A. tschuktschiana*, sp. n., Behring's Sea, Krause, (216) p. 296, pl. xvii. fig. 5.

Tritonia psoloides, sp. n., Arctic Ocean, Aurivillius, *t. c.* p. 373, pl. xiii. fig. 20.

Polyceridæ.

Polycera quadrilineata, O. F. Müll., described, with anatomical details; Jhering, (200) p. 16.

Aegires leuckartii, Ver., anatomy of; *id. t. c.* p. 24.

Triopa clavigera, O. F. Müll.: anatomical notice; *id. t. c.* p. 32.

Euplocamus croceus, Phil., *id. t. c.* p. 35.

Drepania graeffei, Bgh., *D. tartanella*, sp. n., Naples, *id. t. c.* p. 37.

Goniodoridida.

Idalia mediterranea, sp. n., Naples, *id. t. c.* p. 39.

TECTIBRANCHIATA.

Tectibranchiata, anatomy of; Vayssière (364). [See also p. 24, *antea*.]

Actæonidæ.

Actæon puncto-striatus (Adams), Stimpson, figured by Bush, (60) p. 467 pl. xlv. fig. 17; *A. hebes*, sp. n., Verrill, (367) p. 428, pl. xliv. fig. 1 off Chesapeake Bay, 2500 fath; *A.* (*Amathis*, A. Ad.) *senegalensis*, sp. n.: Gorée, Senegal, Maltzan, (246) p. 29.

Tornatella vagabunda, sp. n., Magellan's Strait, Mabille, (239A)

TORNATINIDÆ.

Volvula oxytata, sp. n., Bush, (60) p. 468, pl. xlv. fig. 12, 7–17 fath.; *V. minuta*, sp. n., *id. t. c.* p. 469, pl. xlv. fig. 11, 14-16 fath.

SCAPHANDRIDÆ.

Cylichna eburnea, sp. n., Verrill, (367) p. 428, pl. xliv. fig. 14, off Cape Hatteras, 70 fath. *C. biplicata* (Lea), figured by Bush, (60) p. 467, pl. xlv. fig. 14, off Cape Hatteras, 7–48 fath. *C. cælata*, sp. n., *id. t. c.* p. 468, pl. xlv. fig. 15, 15–43 fath.

BULLIDÆ.

Bulla candei, d'Orb., figured by Bush, (60) p. 468, pl. xlv. fig. 13. *B. australis*, Gray, has erroneously appeared as *B. australis*, Q. & G., and *B. oblonga*, A. Adams; Brazier (51).

APLUSTRIDÆ.

Akera (*Bullina*) *melinda*, sp. n. (= *Bulla lajonkaireana*, Bast.); Gregorio, (145) p. 81.

Bullina lineata (Gray), variously quoted as of Brit. Mus. and Wood, = *B. undata*, H. & A. Adams, and *Aplustrum lineatum*, Hutton; Brazier (51).

PHILINIDÆ.

Philine sagra (d'Orb.) figured by Bush, (60) p. 467, pl. xlv. figs. 16 & 16*a*, off Cape Hatteras, 15 fath. *P. polaris*, sp. n., Bering's Sea, Aurivillius, (9) p. 371, pls. xii. figs. 21 & 22, & xiii. fig. 18.

APLYSIIDÆ.

Aplysiella webbii to be separated from *Aplysia* and brought nearer to *Notarchus*; Vayssière, (364) p. 71. *Notarchus*: anatomy [see p. 24].

PLEUROBRANCHIDÆ.

Oscanius, Leach, recharacterized; Vayssière, (364) p. 121.

Pleurobranchus americanus, sp. n., Verrill, (367) p. 429, pl. xliv. fig. 13, off Martha's Vineyard, U.S.A., 250 fath.

PECTINIBRANCHIATA.

TOXOGLOSSA.

TEREBRIDÆ.

(1[illegible] Tryon (358) admits only the one genus *Terebra* (with the subgenus *Br[illegible]ta*, Adams), in which he includes *T. aciculata*, Lmk., *T. trilineata*,

Ad. & Angas, *T. brazieri*, Angas, *Euryta pulchella*, Angas, the two being united as *T. angasi*, n. n.

Acus kirki, Hutton, = *Terebra tristis*, Desh.; Hutton (191).

Terebra castigata, sp. n., Gulf of Suez, Cooke, (85) p. 329.

Conidæ.

Conus mediterraneus: varieties of; Gregorio, (145), p. 109. *C. delessertii* (?) Recluz (= ? *C. floridanus*, Gabb), described; Bush, (60) p. 453, 48 fath.

Cylinder (Montfort), subg. of *Conus*, L., is thus subdivided by Melvill (258):—

I. Textilia.
  (a) *Vera*, (b) *Abbates*, (c) *Pyramidalia*.
II. Retiferi.
III. Lucidi.
IV. Aulici.
  (a) *Crocati*, (b) *Episcopi*.
V. Aurei.

C. gloria maris belongs to group I. (c); only 11 specimens of it are known to exist, and it is regarded as extinct.

Pleurotomidæ.

Bela lütkeana, *B. metschigmenensis*, *B. albrechti*, spp. nn., Behrings Sea, Krause, (216) pp. 276 & 281, pl. xviii.; several other spp. figured. *B. blakei*, sp. n., Verrill, (367) p. 417, pl. xliv. fig. 8, off Chesapeake Bay, 2000 fath. *B. tenuicostata*, G. O. Sars, off New England Coast in 800–1200 fath.; this is not the form enumerated in Tr. Conn. Ac. v. p. 481. *B. harpa*, *B. murdochiana*, spp. nn., Point Barrow, Dall, (96) pp. 523 & 524, pl. ii. fig. 8. *B. bicarinata* var. *exserta*, n., Arctic Ocean, Aurivillius, (9) p. 347.

Daphnella payeni, sp. n., Orange Bay, Patagonia, Rochebrune & Mabille (313) p. 101.

Defrancia tritonides wrongly identified by M'Andrew, his shells from the Gulf of Suez being probably a new species, but immature; Cooke (85).

Gymnobela brevis, sp. n., Verrill, (367) p. 417, off New England Coast, 1200–1600 fath.

Mangilia psila, sp. n., Bush, (60) p. 455, pl. xlv. fig. 2, Cape Hatteras, 48 fath. *M. eritima*, sp. n., *id. t. c.* p. 456, 14–17 fath. *M. ephamilla*, *id. t. c.* p. 457, pl. xlv. figs. 4 & 4*a*, 14–48 fath. *M. ceroplasta*, sp. n., *id. t. c.* p. 458, 10–17 fath. *M. melanitica*, Dall, MS., var. *exia*, *id. t. c.* p. 459, pl. xlv. figs. 3 & 3*a*, 7–48 fath. *M. oxytata*, Bush; *id. t. c.* p. 460, pl. xlv. fig. 1, 48 fath. *M.* (?) *glypta*, Bush; *id. t. c.* p. 461, pl. xlv. figs. 5 & 5*a*, 16–48 fath. *M.* (?) *nigropunctata*, sp. n., S. Georgia, v. Martens, (253 p. 91.

Pleurotoma beringi, sp. n., Behring's Sea, Aurivillius, (9) p. 354, pl. xii fig. 3. *P. insignis*, Jeffr., = *P. circinatum*, Dall; *id. t. c.* p. 353.

...omella jeffreysii, P. tincta, P. frielii, P. vitrea, P. lottæ, spp. nn., ...ortions : ...land Coast, 428–2500 fath, Verrill, (367) pp. 411–415, pl. xliv.

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R. (?

Cancellariidæ.

Tryon, (358) p. 66, admits only the genus *Cancellaria*, divided into two sections (*Cancellaria* and *Trigonostoma*), of which the former is again subdivided into *Euclia* and *Merica* ; *Admete* is regarded as a subgenus. The author recognizes 77 species, and records 23 others as insufficiently characterized.

Admete nodosa, sp. n., Verrill, (367) p. 419, pl. xliv. fig. 9, off Martha's Vineyard, U.S.A., 900 fath. ; *A. frigida*, sp. n., Tierra del Fuego, Rochebrune & Mabille, (313) p. 104.

Cancellaria. 17 species (none new) enumerated by Löbbecke (233). *C. multienensis*, n. n. for *C. bezançoni*, Malet (*nec* Raincourt), J. de Conch. xxv. p. 196. *C. mitræformis*, Brocchi, *C. pusilla*, H. Ad., *nec* Sow., *C. minima*, Rve., Atlantic ; Jeffreys, (197) p. 49.

RHACHIGLOSSA.

Marginellidæ.

Marginella virginiana, sp. n., Verrill, (367) p. 420, off Cape Hatteras and Chesapeake Bay, 15–70 fath. *M. fornasinii*, sp. n., Miocene, Bologna, Foresti, (134) p. 11.

Volutidæ.

Guivillea, n. n., = *Wyvillea*, Watson, preoccupied ; Watson, in Chall. Nar. i. p. 895, p. 328.

Cymba olla, L., South-west of Portugal ; Nobre (280).

Mitridæ.

Mitra cymochara, sp. n., Cape Horn, Rochebrune & Mabille, (313) p. 102. *Mitra wisemanni*, not Issel, but Géné, and other errors of Tryon corrected ; Cooke (85) p. 335.

Fasciolariidæ.

Fusus rusticulus, Monteros., figured for the first time by Kobelt, (213A) pl. xv. figs. 10 & 11. *F. decipiens*, sp. n., Behring's Sea, Aurivillius, (9) p. 356, pl. xiii. figs. 4, 5, & 13.

Latirus pulcher, Reeve, Gulf of Suez ; Cooke (85) p. 326.

Buccinidæ.

Brongus, subg. n. of *Neptunea*. For *Fusus antiquus*, L. ; Gregorio, (145) p. 47.

Buccinum campbelli, B. veneris, spp. nn., Campbell I., Filhol, (122)

pp. 524–526. *B. angulosum* var. *lævis*; *B. groenlandicum* var. [illegible] *B. ovum* var. *angulata*, nn., Behring's Sea: Aurivillius, (9) pp.

B. glaciale, L., *B. angulosum*, Gray, *B. plectrum*, Stimps., *B. polare*, figured by Dall (95). *B. schneideri*, sp. n., Vardö, Norway, with rema[illegible] on other Northern forms; Verkrüzen (366).

Cominella (*Chlanidota*) *densesculpta*, *C. modesta*, spp. nn., S. Georgia, v. Martens, (253) p. 91.

Euthria cerealis, sp. n., Tierra del Fuego, Rochebrune & Mabille, (313) p. 100.

Halia priamus referred to this family on basis of anatomical examination; Poirier (295) [see also p. 25].

Jumala brychia, sp. n., Verrill, (367) p. 422, pl. xliv. figs. 10 & 10*a*, off Chesapeake Bay, 2500 fath.

Neptunea kröyeri var. *rayana*, n., Arctic Ocean, Dall, (96) p. 524.

Savatieria, g. n. Minute, turriculate, longitudinally sulcate, decussate with spiral lines more or less distinct; mouth ovate, groove short, straight, not recurved, with the outer margin thickened, not denticulate. For *S. frigida*, sp. n., E. Patagonia, Rochebrune & Mabille, (313) p. 101.

Sipho roseus (Dall): shell and radula figured by Krause, (216) p. 285, pl. xvii. figs. 4*a* & *b*. *S. martensi*, sp. n., *id. t. c.* p. 287, pl. xviii. fig. 18, Metschigmen Bay, Behring's Sea. *S. turritus* (*nec* Sars), *S. olivaceus*, spp. nn., also some varr. nn.: Aurivillius (9) pp. 360–368.

Nassidæ.

Bullia pura, sp. n., Port Elizabeth, S. Africa, Melvill, (259) pl. xi. fig. 2.

Canidia, H. Ad., radula of; Schepman, (323) pp. 30–32, pl. iv. figs. 6–9.

Dorsanum fuscum (Crav.), Bœttger (32), from Lower Congo, related to W. European Oligocene & Miocene.

Fluviodorsum, sect. n., gen. *Dorsani*, Gray. "T. apice rotundato obtusa, non decollata, epidermide adhærente fusca induta, columella oblique truncata, rostro parvo inciso, a basi anfr. ultimi carinula spirali acuta, uti in gen. *Dorsano*, separato." W. Africa. For *Bullia fusca*, Craven; *id. t. c.* p. 188.

Nassa livida, Gray: *N. rutilans*, Rv. (Conch. Icon. pl. xxii. fig. 147), is a synonym; Brazier (51). *N.* (*Hinia*) *reticulata*, L., var. *coronata*, n., Portugal, Nobre (280).

Muricidæ.

Murex senegalensis, Bœttger (32), Lower Congo, common also to Brazil.

Polytropa striata (Martyn), Campbell I., Filhol, (122) p. 526.

Sinusigera to be abandoned as representing merely several different immature forms, and *Cheletropis* as being a synonym; Crosse (90).

Trophon abyssorum (= *T. clavatus*, Verrill, *nec* Sars) n. n., and var. *limicola*, n.; Verrill, (367) p. 421, off New England Coast, 800–2400 fath. *T. brevispira*, sp. n., S. Georgia, v. Martens, (253) p. 91. *T. middendorffi*, n. n. (= *T. laciniatus*, Middf., Malac. Ross., pl. i. fig. 8); Gregorio, (145) p. 27, footnote.

subg. n. of *Trophon*; type, *T. vaginatus*, Phil. Also *Chalmon*; ...rtions: *muricatus*, Mont. *Pirgos*; type, *T. alveolatus*, Wood: and *Risella*; type, *T. giratum*. *Id. t. c.* pp. 27 & 28.

R. Vexilla, Swainson, radula of; Schepman, (323) pp. 27–30, pl. iv. figs. 1–5.

TÆNIOGLOSSA.

Tritonidæ.

Triton clavator, Lamk., Gulf of Suez, Cooke, (85) p. 333.

Cassididæ.

Tryon, (358) p. 268, places here *Cassis* (with sections *Cassis*, *Levenia*, *Cypræcassis*; subgenus *Semicassis*, sections *Semicassis*, *Bezoardica*, *Cosmaria*); *Cassidaria* (with subgenus *Sconsia*); *Oniscia* (with sections *Oniscia* and *Oniscidia*), and *Pachybathron*.

Cassis coronadoi, Crosse, placed in *Cassidaria*; *id. t. c.* p. 280: Crosse replies, J. de Conch. xxv. p. 517. *C. pomum*, Wagn., *C. nucleus*, Küster, *C. reticulata*, Bellardi, *C. striatella*, *C. incrassata*, Grat., *C. texta*, Bronn, *C. diluvii*, *C. inflata*, *C. striata*, Serres, all reduced to *C. saburon*, Adanson. Tryon, (358) p. 275.

Doliidæ.

Tryon, (358) p. 258, admits the genera *Dolium* (with subgenera *Dolioopsis*, *Malea*) and *Pyrula* (subgenera *Ptychosycha*, *Ficulopsis*).

Dolium variegatum from Lord Howe I., most easterly locality yet known; Wilkinson, Zool. Anz. viii. p. 760.

Ficula reevei, n. n. (= *F. reticulata*, Reeve, pl. i. fig. 1); Gregorio, (145) p. 64. *F. reticulata* (Lmk.): 9 varieties; *id. t. c.* p. 55. Also review of some living species; *id. t. c.* p. 62.

Pyrula longiclava, n. n. (= *P. clava*, Bast., Hörnaes, Moll. Wien, pl. xxviii. fig. 9); *id. t. c.* p. 51.

Cypræidæ.

Roberts, (358) p. 162, recognizes one genus, *Cypræa*, and one subgenus, *Trivia*. The former is divided into four sections, according to the form of the shell, and these again into groups and sub-groups, according to the surface and coloration, but these are not considered as of systematic value.

Cypræa brevidentata, Sow., and *C. crossei*, Marie, = vars. of *C. stolida*, Linn.; *id. t. c.* p. 171. *C. ethnographica* and 6 other species of Rochebrune reduced to varieties of *C. moneta*; *id. t. c.* p. 178. *C. lienardi* and *C. tricornis*, Jousseaume, reduced to vars. of *C. cicercula*, L.; *id. t. c.* p. 198.

Ovulidæ. Tryon, (358) p. 243, recognizes one genus, *Ovula*, with subgenera *Cyphana*, *Volva*, *Neosimnia*, *Crithe*, and *Calpurnus*, with several fossil genera; 47 species are described, none new.

Strombidæ.

Tryon, (358) p. 99, divides this into three sub-families: *Strombinæ*, *Aporrhaïnæ*, and *Struthiolariinæ*.

Cerithiopsis, N. Atlantic forms classified: *C. jeffreysi*, sp. n. (= *C. pulchella*, Jeffr., preocc., *concatenata*, Conti, see errata in J. L. S.); *C. tiara*, sp. n., Madeira, Palermo; *C. diadema*, sp. n., Madeira, Mediterranean; *C. atalaya*, sp. n., Madeira: Watson (374). *C. horrida*, sp. n., Mediterranean, Jeffreys, (197) p. 60, pl. vi. fig. 9. *Cerithium gracile*, *C. obeliscoïdes*, *C. cylindratum*, spp. nn., *C. watsoni*, n. n. (= *C. gemmatum*, Wats.), E. Atlantic and Mediterranean; *id. t. c.* pp. 52–55, pl. vi.

Stilus, g. n. Like *Cerithium*, but with apex peculiarly twisted, basal notch short and recurved; for *S. insignis*, sp. n., E. Atlantic; *id. t. c.* p. 52, pl. vi. fig. 1.

Strombella malleata, sp. n., Point Barrow, Dall, (96) p. 525.

Strombus has not received any material accessions of new species since the publication of Reeve's Monograph (1851); *t. c.* p. 107.

Strombus australis is really of Gray, not of Sowerby, as generally stated; Brazier (51).

Triforis turris-thomæ (D'Orb.), Dall, figured by Bush, (60) pl. xlv. fig. 6. *T. aspera*, sp. n., E. Atlantic and Mediterranean, Jeffreys, (197) p. 58, pl. vi. fig. 7.

Vertagus recurvus = *V. kochi*; Cooke, (85) p. 45.

Planaxidæ.

Planaxis savignyi, Desb., var. *encaustica*, E. A. Sm., Arakan, most easterly known hab.; Nevill, (277) p. 186. *P. similis*, E. A. Sm., = *P. acutus*, Krauss; *id. t. c.* p. 190. *P. breviculus*, Desh., = *P. sulcatus*, Born; Cooke, (85) p. 46.

Nerineidæ.

Aptyxiella, g. n.; for *A. sexcostata* (D'Orb.); Fisher, (123) p. 689.

Trichotropidæ.

Trichotropis fimbriata, *T. denzistriata*, spp. nn., E. Atlantic, Jeffreys, (197) p. 48, pl. v. figs. 7 & 8. *T. solida*, sp. n., Behring's Sea, Aurivillius, (9) p. 328, pl. xii. fig. 16. *T. kroyeri*, Phil., radula figured and described by Krause, (216) p. 269, pl. xvi. fig. 3.

Vermetidæ.

Serpula milma, sp. n., appears in Gregorio, (145) p. 122 [? by error for *Vermetus*.—Rec.].

Vermetus, development of, Salensky [see p. 40, *anteà*]

...rtions :

Turritellidæ.

Risella *R.* (*Turritella*) *reticulata*, Migh., radula and described and figured by Krauss, (216) p. 271, pl. xvii. fig. 3.

Melaniidæ.

Amphimelania, subg. n. ; type, *M. holandri*, Fér., = *Melanella*, Swains., *nec* Dufresne ; Fischer, (123) p. 701.

Bourguignatia, g. n. ; type, *B. imperialis*, sp. n., Lake Tanganyika, Giraud, (138A) p. 193.

Clea costulata, sp. n., Pleyharie, Borneo, Schepman, (323) p. 32.

Hantkenia, Munier-Chalmas, MS. ; for *H. pichleri* (Hoernes) ; Fischer, (123) p. 704.

Mainwaringia, subg. n., *Melania* (*M.*) *paludomoidea*, sp. n., Mutlah River ; Nevill, (277) p. 287.

Melania fastigiella, Reeve, figured by E. A. Smith, (343) p. 601, pl. xxxvii. fig. 1. *M. subgradata*, sp. n., *id. t. c.* p. 601, pl. xxxvii. figs. 3 [illegible]. *Melania ugiensis*, sp. n., *id. t. c.* p. 602, pl. xxxvii. fig. 4. *M. Climacopom*, sp. n., *id. t. c.* pl. xxxvii. figs. 5 & 5*a*. *M. guppyi*, sp. n., *id.* ascribed to xvii. figs. 6 & 6*a*, Solomon Islands. *M. tumida* var. *cinna-Omalo*, and *M. pranotata* varr. *intermedia*, *minor*, Quangtung and Queichow, Gredler, (142) pp. 233 & 234. *M. clavus*, Lmk., var. *pirenoidea*, n., *M. acutissima*, Busch, var. *perstriatula*, n., Guam ; *M. subula*, Lea, var. *contracta*, n., Cebu ; *M. hastula*, Lea, varr. *subacutissima*, Katchall, Andaman Is., *subflammulata*, Guimaras, *subcostata*, Philippine Is., *subpicta*, Ternate, *pseudaculeus*, Marianne Is., nn., last = *M. aculeus*, Morelet, *nec* Lea ; *M. zelebori*, Brot, varr. *nana*, Great Nicobar, *solidiuscula*, Andaman Is., nn. ; *M. canalis*, Lea, var. *lanceolata*, n., Cebu ; *M.* (*Striatella*) *arthuri*, Brot, var. *pseudomaurula*, n., New Caledonia ; *M.* (*S.*) *scitula*, Gould, var. *subcylindrica*, n., Navigator's Is. ; *M.* (*S.*) *sublutosa*, sp. n., Great Nicobar ; *M.* (*S.*) *nevilli*, Brot, var. *andamanica*, n., Andaman Is. ; *M.* (*S.*) *nicobarica* (Mörch), varr. *canaliculata*, *fusiformis*, *perstriatula*, nn., Andaman and Nicobar Is. ; *M.* (*S.*) *tuberculata*, Müll., varr. *subcanaliculata*, Seychelles, *canaliculata*, hab. ?, *subcrebra*, Ceylon, *orissaënsis*, Cuttack, Orissa, *cochinchinensis*, Cochin China, *chinensis*, Swatow, *myadoungensis*, Myadoung, Upper Burma, *pseudo-truncatula*, Mauritius, Bourbon, *appressa*, Mauritius, nn. ; *M.* (*S.*) *rivularis*, Phil., var. *subunifascialis*, n., Andaman Is. ; *M.* (*Melanoides*) *recvei*, Brot, varr. *lanceolata*, Mandalay, Pegu, Thyet Myo, *soliduscula*, Pegu, Noung-ben-Ziek, nn. ; *M.* (*M.*) *towrannensis*, Soul., varr. *compacta*, Pegu, *beddomeana*, Moulmein, nn. ; *M.* (*M.*) *variabilis*, Benson, varr. *subcaricosa*, Aracan and Pegu, *semilævigata*, Cachar and Sylhet, *binodulifera*, Khasi Hills, nn. ; *M.* (*M.*) *subasperata*, sp. n., Shan States, China, var. *sublævigata*, n., Burma, Shan States ; *M.* (*M.*) *filocarinata* (Mousson) var. *subimbricata*, n., San Palo ; *M.* (*Sulcospira*) *libertina*, Gould, var. *microstoma*, n., Formosa ; *M.* (*Pachychilus*) *testudinaria*, Busch, varr. *elongata*, *subangulata*, nn., Java ; *M.* (*P.*) *hungerfordiana*, sp. n., Pegu, Upper Burma ; *M.* (*Acrostoma*) *hügeli*, Phil., var. *compacta*, n., Wynaad, Cochin Hills, Cauvery River ;

M. (*A.*) *assamensis*, sp. n. (= *M. hügelii* var., Hanley), N Delaima; *M.* (*Tarebia*) *batana*, Gould, var. *sublineata*, n., Coch Penang; *M.* (*T.*) *rudis*, Lea, var. *ceylonica*, n., Ceylon, Tenasseri. (*Plotia*) *acanthica*, Lea, var. *roepstorffiana*, Andaman Is.: Nevill, (2[illegible] pp. 224–281.

Paludomus conica (Gray), varr. *sibsaugorensis*, Sibsagar, *pealiana*, Assam, Sibsagar, *jaintiaca*, Jaintia Hills, *kopiliensis*, N. Assam, *paludinoides*, Sikkim, nn.; *P. tanjoriensis*, Gm., varr. *kadapaensis*, Madras, *malabarica*, Travancore, Pulney Hills, nn.; *P. rotunda*, Blanf., var. *microstoma*, n., Anamallay River, Madura Hills; *P. ajanensis*, Morelet, var. *silhouettensis*, n., Seychelles; *P. microsculpta*, sp. n., Ceylon; *P.* (*Philopotamis*) *sulcata*, Rv., var. *contracta*, n., Ceylon; *P.* (*P.*) *nigricans*, Rv., var. *subgranulosa*, n., Ceylon; *P.* (*P.*) *erronea*, sp. n., Ceylon: *id. t. c.* pp. 288–300. *P. rusiostoma*, sp. n., Queichow, Gredler, (142) p. 231, pl. vi. fig. 7. *P.? minutiusculus*, sp. n., Queichow, *id. t. c.* p. 232, pl. vi. fig. 8.

Paramelania callopleuros, *P. grandidieriana*, *P. hamyana*, *P. reymondi*, *P. bourguignati*, *P. baizeana*, *P. stanleyana*, *P. spinulosa*, *P. milne-edwardsiana*, *P. lessepsiana*, *P. duveryieriana*, *P. cameroniana*, *P. ledoubxiana*, *P. egregia*, *P. giraudi*, *P. locardiana*, *P. servainiana*, *P. crassilabris*, *P. livingstoniana*, *P. pulchella*, spp. nn., Lake Tanganyika, [illegible] (41A) pp. 69–86. [illegible] xlv. fig. 6.

Semisinus, n. n., proposed to replace *Hemisinus*, Swains.; Fischer, (7[illegible] p. 58, p. 701.

Sermyla chaperi, sp. n., Perak, de Morgan, (270) p. 420. *S. perakensis* or *S. kintanensis*, n. n., = *Melania infracostata*, Reeve, which is not *M. infracostata*, Mousson; *id. ibid.*

Stenomelania, subg. n. Type, *M. aspirans*, Hds.; Fischer, (123) p. 701.

Pleuroceridæ.

Goniobasis etowahensis, Lea, figured by Dall, (97) pl. xvii. fig. 7.

Littorinidæ.

Lacuna antarctica, sp. n., S. Georgia, v. Martens, (253) p. 92.

Lacunella, Dall, 1884 [see Zool. Rec. xxi. *Moll.* p. 48], *nec* Desh., 1861, name preocc.; author proposes *Haloconcha*, MS.

Limnotrochus giraudi, *L. cyclostoma*, spp. nn., Lake Tanganyika, Bourguignat, (41A) pp. 59 & 60.

Littorina pellita, sp. n., S. Georgia, v. Martens, (253) p. 92. *L. cærulescens*, L., Morgat, near Brest, Daniel (100). *L. filosa*, Sow., var. *subcingulata*, n., Port Jackson, *L. conica*, Phil., varr. *delicatula*, *subintermedia*, nn., Port Canning and False Point, Bengal, *L. erronea*, sp. n. (= *L. novæ-zelandiæ*, Reeve), Ceylon; Nevill, (277) pp. 149–152. *L. neritoides*, Scilly Is., Smart & Cooke, (340) pp. 286 & 296. *L. unifasciata* presents two varieties in Port Vincent, S. Australia: one long, slender, of a bluish white colour; the other short, with light and dark grey chequered pattern; the latter lives in those parts of the rocks which

...oist during the ebb tide, the former on the higher and drier ...rtions : Haecke (152).

Risella (*Peasiella*) *roepstorffiana*, Andaman Is., Burmah, Hong Kong, *R.* (*P.*) *templiana*, Andaman Is., spp. nn., Nevill, (277) p. 161.

Fossaridæ.

Conradia stoliczkiana, Singapore, *S. adamsiana*, Persian Gulf, spp. nn., Nevill, (277) p. 169 ; *C. doliaris*, A. Ad., var. *minor*, n., Bombay, Persian Gulf, *id. t. c.*

Fossar mirabilis, Arakan, *F.* (?) *imperforatus*, Penang, spp. nn., *id. t. c.* p. 165; *F.* (*Couthouyia*) *appressus*, Persian Gulf, *F.* (*C.*) *styliferinus*, Singapore, Bombay, *F.* (*C.*) *solutus*, Persian Gulf, *F.* (*C.*) *subreticulatus*, Persian Gulf, Gwadar, Bombay, spp. nn., *id. t. c.* pp. 167 & 168.

Solariidæ.

Eccyliomphalus, new spelling of *Ecculiomphalus*, Portlock ; Fischer, (123) p. 716.

Climacopoma, subg. n., for *Solarium patulum*, in case the operculum ascribed to *Torinia* should belong to it ; *id. t. c.* p. 714.

Omalaxis nobilis, sp. n., Verrill, (367) p. 423, pl. xliv. fig. 12, off Chesapeake Bay, 70 fath. ; genus spelt *Homalaxis*, Fischer, (123) p. 715.

Pseudomalaxis, subg. n. of *Torinia*. Type, *P. zanclæa* (Phil.) ; *id. t. c.* p. 714.

Skeneidæ.

Skenea trilix, sp. n., Bush, 60) p. 464, pl. xlv. figs. 7 & 7*a*, Cape Hatteras, 7–17 fath.

Litiopidæ.

Alaba senegalensis, sp. n., Gorée, Senegal, Maltzan, (246), p. 28 ; *A. woodmasoniana*, sp. n., Andaman Is., Nevill, (277) p. 182.

Cingula robusta, Dall, MS., described and figured by Krause, (216) p. 270, pl. xvii. fig. 1, Behring's Sea, 1–5 fath.

Fairbankia bombayana, Blandf., var. *depauperata*, n., Bombay Harbour, Nevill, (277) p. 99.

Onoba delicata (Phil.) var. *microstoma*, n., Roweia and Galle, Ceylon, Annesley Bay, Red Sea ; *id. t. c.* p. 120.

Rissoia, proposed new spelling of *Rissoa* ; Fischer, (123) p. 720.

Rissoa grisea, sp. n., S. Georgia, v. Martens, (253) p. 92.

Rissoina ambigua, Gould, var. *perpusilla*, n., Mauritius, Bombay, Persia, *R. woodmasoniana*, Andaman Is., *R. indica*, Paumben Straits, S. India, spp. nn., *R. micans*, Adams, var. *perstriatula*, n., Persian Gulf, *R. monilifera*, Japan, *R. mainwaringiana*, Persian Gulf, spp. nn., *R. seguenziana*, Issel, var *panula*, n., Annesley Bay, Red Sea, *R. montrouzieri*, Souv., varr. *monstrosa*, *substriolata*, *convexior*, nn., Andamans, *R. orbignyi*, A. Ad.,

varr. *subspirata*, Aden, *pachylabris*, Annesley Bay, Red Sea, *subm.* Andaman Is., nn., *R. insolita*, Desh., varr. *major*, Mauritius, *depaupe-ata*, Mauritius, Singapore, nn., *R.* (*Isseliella*) *pseudoconcinna*, sp. n., Japan; Nevill, (277) pp. 74–98.

Thapsiella, n. n. for *Thapsa*, Mont., *nec* Albers; Fischer, (123) p. 721.

Adeorbidæ.

Adeorbis subcarinatus (Mont.) has been examined anatomically by Fischer (125), and, on the basis of this investigation, is placed near the *Rissoidæ* and *Skeneidæ*.

Hydrobiidæ.

Amnicola schrokingeri, Frauenf., hab. Mass., U.S.A.; Dall, (97) p. 257. *A. cincinnatiensis*, Anth. (= *Paludina truncatella*, Ziegler, MS.), New Orleans; *id. t. c.* p. 257. *A. dalli*, sp. n., Nevada, Call, (62) p. 45, pl. vi. figs. 4–6.

Avenionia and *Paulina* = a small section of *Bithinella*; *B. bourguignati* and *B. berenguieri* additionally characterized and figured: Fischer (124); found in a well near Avignon.

Baizea, g. n., like *Lithoglyphus*, but umbilicus surrounded by a ridge as in *Spekea*; for *S. giraudi*, sp. n., Lake Tanganyika, Bourguignat, (41A) pp. 33 & 34.

Bithinella monroensis, Dall, (97) p. 256, pl. xvii. fig. 9 (probably = *Hydrobia monroensis*, Frauenfeld), hab. Enterprise, Fla. *B. lancelevi*, sp. n., Seine, Locard (234).

Bithinia kintana, sp. n., Perak, de Morgan, (270) p. 416, pl. vii. fig. 7. *B. paeteli*, *B. minutoides*, spp. nn., China, Gredler, (142A) pp. 13 & 14. *B. pulchella*, Benson, varr. *obtusa*, Port Canning, *pusilla*, Ferozpur, nn.; *B. stenothyroides*, Dohrn, var. *abnormis*, n., Bangalore; *B. tentaculata*, L., var. *kashmirensis*, n., Kashmir: Nevill (277) pp. 35–39. *B. subbadiella*, sp. n., Shoa, Bourguignat, (39) p. 30.

Hydrobia caledonensis, sp. n., Caledon, Cape Colony, Chaper, (73) p. 484, pl. xi. fig. 6. *H. dunkeri*, Frf., and *H. schmidtii*, Charp., compared by Brockmeier (53). *H. wetherbyi*, sp. n., Dall, (97), p. 258, pl. xvii. fig. 10, hab. Lake Eustis, Florida. *H. corrigata*, Frauenf., hab. Boston, Mass., *H. seemani*, Frauenf., hab. N.W. Mexico; *id. t. c.* p. 257. *H. gabonensis*, sp. n., Gaboon, Morelet, (268) p. 30, pl. ii. fig. 12.

Lithoglyphus fuchsianus, sp. n., Hunan, China, Möllendorff, (265) p. 169. *L. lapidum*, D'Orb., descriptive and anatomical details; Jhering (199).

Pseudoamnicola clessini, n. n., = *Assiminea adriatica*, Cless.; Brusina, (56) p. 52.

Spekea giraudi, *S. duveyrieriana*, *S. hamyana*, *S. reymondi*, *S. grandidieri*, spp. nn., Lake Tanganyika, Bourguignat, (41A) pp. 36–40.

Stanleya, g. n., for *Lithoglyphus neritoides*, Smith, *S. giraudi*, *S. smithiana*, spp. nn., Lake Tanganyika, Bourguignat, (41A) pp. 87 & 88.

Stenothyra hardouini, sp. n., Pulo Penang, De Morgan, (270) p. 416, pl. viii. fig. 15.

Paludinidæ.

Bridouxia, g. n., resembling *Littorina* and some American species of *Gillia*, thick-shelled, with continuous oval margin; for *B. giraudi*, *B. villeserriana*, *B. costata*, *B. reymondi*, spp. nn., Lake Tanganyika: Bourguignat, (41A) pp. 29–32.

Cleopatra pauli, *C. soleilleti*, *C. percarinata*, spp. nn., Shoa, *id.* (39) pp. 27–29, figs. 1–3; *C. guillemei*, sp. n., Lake Ukerewe, Africa, Bourguignat, (41) p. 6.

Eyriesia, sect. n. *Paludina*; for *P. eyriesi*, Morelet; Fischer, (123) p. 733.

Neothauma tanganyikanum, *N. bridouxianum*, *F. servainianum*, spp. nn., Lake Tanganyika, Grandidier, (139) p. 163; *N. giraudi*, *N. bicarinatum*, spp. nn., same locality, Bourguignat, (41A), pp. 27 & 28.

Paludina philippinensis, sp. n., Majajay, Luzon, near *P. javanica*; *P. siamensis*, Frauenf., var. *burmanica*, n.; *P. dissimilis*, Müll., var. *assamensis*, n.: Nevill, (277) pp. 24–28.

Vitrella hauffeni, n. n., = *P. pellucida*, Hauffen; *V. zelebori*, n. n., = *P. pellucida*, Pars.: Brusina, (56) p. 53.

Vivipara præclara, sp. n., Queichow, Ancey, (4) p. 137.

Hauttecœuridæ, fam. n.

Contains the genera *Tanganyicia*, Crosse, and *Hauttecœuria*, n.; Bourguignat, (41A) p. 41.

Hauttecœuria, g. n., resembling *Tanganyicia*; with continuous oral margin; mouth with a sinus above and below, the latter resembling a canal. Types, *H. hamyana*, *H. giraudi*, *H. milne-edwardsiana*, *H. soluta*, *H. singularis*, *H. duveyrieriana*, *H. reymondi*, *H. maunoiriana*, *H. eximia*, *H. cambieri*, *H. minuta*, spp. nn., Lake Tanganyika, Bourguignat, (41A) pp. 46–57.

Tanganyicia fagotiana, *T. giraudi*, *T. maunoiriana*, *T. ovoidea*, *T. globosa*, spp. nn., same locality, *id. t. c.* pp. 43–46.

Giraudiidæ, fam. n.

Contains genera *Giraudia*, n., and *Reymondia*, n.; *id. t. c.* p. 60.

Giraudia, g. n. Small, recalling *Rissoa* in form, but glistening like *Phasianella*; oral margin thickened, as in *Acme*; columella expanded below, as in *Lacuna*. For *G. præclara*, *G. grandidieriana*, spp. nn., same locality; *id. t. c.* pp. 61–63.

Reymondia, g. n. For *Melania? horei*, Smith, and *R. giraudi*, sp. n., same locality; *id. t. c.* p. 65.

Ampullariidæ.

Ampullaria perakensis, *A. wellesleyensis*, spp. nn., Perak and Wellesley Province, de Morgan, (270) pp. 418 & 419. *A. revoili*, *A. dumesniliana*,

varr. *subspirata*, Aden, *pachylabris*, Annesley Bay, Red Sea, *subu[illegible]* Andaman Is., nn., *R. insolita*, Desh., varr. *major*, Mauritius, *depaupe[illegible]ata*, Mauritius, Singapore, nn., *R.* (*Isseliella*) *pseudoconcinna*, sp. n., Japan; Nevill, (277) pp. 74–98.

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Ampullariidæ.

Ampullaria perakensis, *A. wellesleyensis*, spp. nn., Perak and Wellesley Province, de Morgan, (270) pp. 418 & 419. *A. revoili*, *A. dumesniliana*,

A. ruchetiana, Somali-land, *A. charmesiana*, Nile, Gondokoro, *A. [illegible] gnati*, Ballat Lake, Egypt, spp. nn., Billotte, (20) pp. 103–107, pl. vi. *A. turbinis*, Lea, varr. *subglobosa*, Java?, and *subampullacea*, Perak, nn.; *A. polita*, Desh., var. *compressa*, n., Cochin China; *A.* (*Pomus*) *martensiana*, sp. n., S. America: Nevill, (277) pp. 6–10.

Meladomus duveyrierianus, sp. n., Somali-land, Revoil, (309) p. 99, pl. vi. fig. 5. *M. letourneuxi*, Bgt., described; Berthier (18).

Assimineidæ.

Assiminea antipodum, sp. n., Campbell I., Filhol, (122) p. 523. *A. colombeliana*, sp. n., Mouth of the Yang-tsi-kiang, China, Heude, (173) p. 123, pl. xxxi. fig. 17.

Cyclophoridæ.

Alycæus globulus, *A. anthostoma*, spp. nn., Badung, China, Möllendorf, (265) p. 162. *A. jousseaumei*, *A. kapayanensis*, *A. thieroti*, spp. nn., Perak, de Morgan, (270) pp. 402–404, pl. viii. figs. 4 & 5. *A. chaperi*, sp. n., Malacca, *id.* (271) p. 70. *A. muciferus*, *A. planorbulus*, *A. fargesianus*, *A. neglectus*, *A. diminutus*, spp. nn., China, Heude, (173) pp. 96 & 97, with figs.

Aulopoma lowi, sp. n., Perak, de Morgan, (270) p. 407, pl. vii. fig. 6, and (271) p. 69.

Cyclophorus ferruginosus, *C. fargesianus*, *C. delavayanus*, *C. punctatulus*, *C. frinianus*, *C. mediastinus*, *C. clathratus*, spp. nn., China, Heude, (173) pp. 89–91, with figs. *C. bifrons*, Heude, = *C. chinensis*, Möllendorff, (264) p. 362. *C. lahatensis*, sp. n., Perak, de Morgan, (270) p. 409, pl. viii. fig. 7. *C. lowii*, *C. kintanus*, *C. baylei*, *C. regelspergeri*, spp. nn., Malacca, *id.* (271) p. 69. *C. fimbriosus*, sp. n., Badung, China, Möllendorff, (265) p. 162.

Cyclotus dautzenbergi, sp. n., Perak, de Morgan, (270) p. 398, pl. viii. fig. 1; *C. bourguignati*, sp. n., Transcaucasia, Doumet-Adanson (107) p. 176.

Diplommatina setchuanensis, *D. confusa*, *D. pupinella*, *D. pyra*, spp. nn., China, Heude, (173) pp. 97 & 98, pl. xxiv. figs. 10, 12, 13, & 14. *D.* (*Sinica*) *laurentiana*, *D.* (*S.*) *conica*, spp. nn., Badung, China, Möllendorff, (265) p. 163. *D. nipponensis*, sp. n., Asinoin, Japan, *id.* (262) p. 67.

Hybocystis elephas examined anatomically, and placed in family *Cyclophoridæ*, near *Pupina*; Fischer (126). The genus is monographically catalogued by Crosse (91), who enumerates 4 species (*H. elephas*, *H. gravida*, *H. monhoti*, and *H. myersi*), with synonymy and habitats. *H. elephas*, *H. jousseaumei*, spp. nn., Perak, de Morgan, (270) pp. 404–406, figs. 1 & 2, and (271) p. 70.

Lagochilus swettenhami, sp. n., Perak, *id.* (270) p. 412, pl. viii. fig. 8. For remarks on the genus, see Möllendorff, (264) p. 364: includes *Japonia*, Gould.

...poma (?) *ardouinianum*, sp. n., China, Heude, (173) p. 95, pl. xxv. fig. 8.

Leucoptychia divided into Leptopomiformes (*L. tissotiana*, Crosse, *L. scalaris*, H. Adams), and Cyclophoriformes (*L. foliacea*, Chem., *L. leai*, Tryon) by Crosse (87).

Myxostoma recognitum, *M. setchuanense*, *M. humile*, *M. laciniatum*, *M. aubryanum*, *M. tortile*, *M. expoliatum*, *M. vestitum*, *M. aureum*, *M. tubulare*, spp. nn., China, Heude, (173) pp. 91–95, with figs.

Opisthoporus borealis, sp. n., Badung, China, Möllendorff, (265) p. 161 ; see also *id.* (264) p. 359.

Pomatias tesselatus, Rossm., var. *achaica*, n., Greece, Boettger, (30) p. 123 ; *P. tschemagoricus*, *P. callistoma*, Montenegro, *P. regularis*, *P. pauleius*, Cattaro, *P. bonficoianus*, Lesina, *P. formosus*, Scardona, *P. concinnus*, Spalato, *P. penzianus*, Sebenico, spp. nn., Letourneux, (231) pp. 200–206. *P. reconditus*, *P. intermedius*, *P. agardhi*, spp. nn., also 3 varr. nn., N. Italy, Pini, (289) pp. 368–376. *P. labrosus*, sp. n., Montserrat, Westerlund, (377) p. 117 ; *P. boettgeri*, sp. n., Sicily, *id. t. c.* p. 118 ; *P. oribates*, sp. n., Corfu, *id. t. c.* p. 121 ; *P. tortivus*, sp. n., Dalmatia, *id. t. c.* p. 124 ; *P. alloglyptus*, n. n. for *P. bourguignati*, Fagot ; *P. segnis*, sp. n., N. Italy, *id. t. c.* p. 131. Several spp. nn. proposed by Pini criticized by Gredler (143).

Pseudopomatias amœnus, g. & sp. nn., Badung, China, Möllendorff, (265) p. 164.

Pterocyclos regelspergeri, sp. n., Perak, de Morgan, (270) p. 400, pl. viii. fig. 3. *P. liuanus*, *P. cycloteus*, spp. nn., Hoonan, Gredler, (142) pp. 226–228, pl. vi. figs. 5 & 6.

Ptychopoma, subg. n. of *Cyclophorus*. Type, *C. chinensis*, Möllendorff, (264) p. 362.

Pupina solomonensis, sp. n., Shortland I., Bougainville Sts., E. A. Smith, (343) p. 597, pl. xxxvi. figs. 9 & 9*a*. *P. lowi*, *P. tchehelensis*, spp. nn., Perak, de Morgan, (270) pp. 414 & 415, pl. vii. figs. 3 & 4. *P. fuchsi*, sp. n., China, Gredler, (142A) p. 11. *P. destructa*, sp. n., China, Heude, (173) p. 98, pl. xxiv. fig. 15.

Rhiostoma jousseaumi, sp. n., Perak, de Morgan, (270) p. 400, pl. viii. fig. 2.

Sinica, sect. n. of *Diplommatina*. For *D. sculptilis*, sp. n., Quangtung, Möllendorff, (264) p. 369.

Spirostoma, g. n. "Testæ apertura integra, peristomate duplici ; spiræ summo apiculari-mamillato ; operculo corneo, pellucido, concavo, pyramidali-conico ; spira obliqua, sutura canaliculata, apice plano, extico" ; for *S. frinianum*, sp. n., China, Heude, (173) p. 95, pl. xxix. fig. 2

Cyclostomatidæ.

Atropis obesa, sp. n., Society Is., Garrett (136).

Craspedopoma servaini, sp. n., Madeira, Doumet-Adanson, (107) p. 174.

Cyclostoma and *Pomatias* compared by Simroth (335) in habits, motion, and anatomy, and referred to two widely distinct families.

Guillainia, Crosse, prior to *Rochebrunia*, Bgt.; Ancey, (6) p. [illegible]

Omphalotropis nebulosa, Pease, figured by E. A. Smith, (343) p. 59[illegible] pl. xxxvi. fig. 8.

Otopoma humbloti, *O. polyzonatum*, *O. anaglyptum*, spp. nn., Comoro Is., Morelet, (269) pp. 298–300, pl. xiv. figs. 4, 15, & 14.

Tudorella, subg. n. For *Cyclostoma ferrugineum*, Lmk.; Fischer, (123) p. 747.

Aciculidæ.

Albertisia, Issel, is an immature *Truncatella*; Issel, (193) p. 8.

Truncatellidæ.

Truncatella truncatula shown to be branchiate, not pulmonate; Vayssière (365); see also p. 31, *antea*.

Lamellariidæ.

Lamellaria tenuis, sp. n., E. Atlantic, Jeffreys, (197) p. 45, pl. v. fig. 5; *L. diegoënsis*, sp. n., California, Dall, (281) p. 538, pl. xxiv. figs. 1–3.

Capulidæ.

Diaphorostoma, n. n., = *Platyostoma*, Conrad, *nec* Klein; Fischer, (123) p. 756.

Naticidæ.

Eunaticina, n. n., = *Naticina*, Gray, *nec* Guilding, subg. n. of *Sigaretus*; Fischer, (123) p. 768.

Megatylotus, sect. n. *Ampullina*; for *A. crassatina*, Lmk.; *id. t. c.* p. 766.

Natica notabilis, *N. subplicata*, *N. angulata*, *N. globosa*, *N. compacta*, *N. obtusa*, *N. operculata*, spp. nn., from E. Atlantic and Mediterranean, Jeffreys, (196) pp. 32–34, figs. *N. lebruni*, *N. conteaudi*, *N. omoia*, *N. secunda*, spp. nn., Santa Cruz, Patagonia (last two tertiary fossils), *N. payeni*, sp. n., Cape Horn, Rochebrune & Mabille, (313) pp. 102–104.

Rumella, g. n. Small, smooth, resembling *Ruma*; animal and operculum unknown; for *R. giraudi*, *R. milne-edwardsiana*, spp. nn., Lake Tanganyika, Bourguignat, (41A) pp. 89–91.

Seguenziidæ, fam. n.

Intermediate between *Subulitidæ* and *Adeorbidæ*; Fischer, (123) p. 771.

Seguenzia tricarinata, *S. laxa*, spp. nn., E. Atlantic, Jeffreys, (197) pp. 43 & 44.

PTENOGLOSSA.

Ianthinidæ.

Ianthina rotundata, Leach: notes on occurrence at Sicily; Smart & Cooke (340) p. 298.

Scalariidæ.

Acirsa decussata (Cantr.) not a *Scalaria*, as stated by Jeffreys; *A. prælonga*, Jeffr., belongs to *Acrilla*: Boury (44).

Elasmonema, n. n., = *Callonema*, Hall, *nec* Conrad; Fischer, (123) pp. 778.

Scalaria inclyta, sp. n., hab.?, Melvill, (259) pl. xi. fig. 1. *S. leptalea*, sp. n., Bush, (60) p. 465, 14–16 fath. *S. teres*, sp. n., *id. t. c.* p. 465, pl. xlv. fig. 8, 16 fath. *S. trochiformis*, *S. senegalensis*, *S. bœttgeri*, spp. nn., Gorée, Senegal, Maltzan, (246) pp. 25 & 26.

GYMNOGLOSSA.

The *Gymnoglossa* are divided into two groups:

1. *Homœostropha*: nucleus regularly coiled (*Eulimidæ*).
2. *Heterostropha*: nucleus coiled in a plane different from the remainder of the shell, or irregularly (*Pyramidellidæ*).

Fischer, (123) p. 780.

Eulimidæ.

Eulima candida, Marrat, from Formosa; Smith (344).

Niso æglĕes, sp. n., Bush, (60) p. 465, pl. xlv. figs. 10 & 10*a*, 7–32 fath.

Pyramidellidæ.

Brachystomia (type, *Odostomia rissoides*, Hanley), *Auristomia* (type, *Odostomia erjaveciana*, Brus.), sectt. nn. *Odostomia*; Monterosato, (266) pp. 200 & 201.

Obeliscus suturalis, sp. n., Gorée, Senegal, Maltzan, (246) p. 26.

Odostomia engonia, sp. n., and var. *teres*, Bush, (60) pp. 466 & 467, pl. xlv. fig. 9, 15 & 16 fath.

Pyrgisculus [type, *Pyrgulina scalaris*, (Phil.)], *Pyrgostelis* [type, *Pyrgulina rufa*, (Phil.)], *Pyrgostylus* [type, *Pyrgulina striatula*, (Linn.)], sectt. nn. *Pyrgulina*; Monterosato, (266) pp. 82 & 83.

Turbonilla mülleri, *T. senegalensis*, near *T. lactea*, L., *T. rosea*, spp. nn., Gorée, Senegal, Maltzan, (246) pp. 27 & 28. *T. perlepida* and *T. grandis*, spp. nn., Verrill, (367) p. 427, off Chesapeake Bay, 70 & 1500 fath. *T. fasciata* and *T. metula* certainly, and *T. acicularis* probably, = *fusca* (A. Ad.); Cooke, (85) p. 39.

De Folin (131) groups, under the name *Chemnitzidæ*, all shells which have the axis of the embryonic shell at an angle with that of the subsequent one, and considers that the family may theoretically be divided

into 16 genera, which he finds to exist in confirmation of h[illegible] thus :

SCULPTURE.	SHELL ELONGATED.		SHELL ROTUND.	
	Without columellar teeth.	With columellar teeth.	Without columellar teeth.	With columellar teeth.
None, shell smooth.	1. *Eulimella*	5. *Turbonilla*	9. *Oceanida*, g. n.	13. *Odostomia*
Longitudinal.	2. *Chemnitzia*	6. *Parthenia*	10 *Salassia*, g. n.	14. *Elodia*, g. n.
Spiral.	3. *Aclis*	7. *Jaminea*	11. *Ondina*, g. n.	15. *Odetta*, g. n.
Both spiral and longitudinal.	4. *Dunkeria*	8. *Stylopsis*	12. *Mathilda*	16. *Noemia*, g. n.

[*Elodia* and *Noemia* are preoccupied; author proposes to substitute *Elodiamea* and *Noemiamea*.—REC.]

SCUTIBRANCHIATA.

RHIPIDOGLOSSA.

HELICINIDÆ.

Eutrochatella, n. n., = *Trochatella*, Swainson, *nec* Lesson ; Fischer, (123) p. 796.

Geophorus, sect. n. *Helicina*; type, *H. agglutinans*, Sowerby : *id. t. c.* p. 795.

Helicina solomonensis, sp. n., E. A. Smith, (343) p. 599, pl. xxxvi. figs. 11 & 11*b*, Faro, Shortland, and Treasury Is., Solomon Is. *H. simulans*, *H. raiatensis*, spp. nn., Society Is., Garrett (136). *H. setchuanensis*, *H. fargesiana*, spp. nn., China, Heude, (173) p. 98, pl. xxiv. figs. 16 & 17. *H. gredleri*, n. n., = *H. mouhoti* var. *martensi*; Möllendorff (264).

Heudeia, g. n. ; type, *Heliçina setchuanensis*, Heude; Crosse (88).

HYDROCENIDÆ.

Georissa sulcata, sp. n., Quangtung, China, Möllendorff, (264) p. 272, pl. ix. fig. 7.

NERITIDÆ.

Nerita marmorata, Hombr. & Jacq. : *N. oleagina*, Reeve, identified with this by E. A. Smith, (343) p. 603.

Neritina cornea, L., figured ; *id. t. c.* p. 603, pl. xxxvii. figs. 7 & 7*b*, hab. Shortland Is., Bougainville Straits, San Christoval, Amboyna and Admiralty Is., Guadalcanar, San Christoval and Ysabel Is., Solomon Group

...ns.). *N.* (*Neritæa*) *hessei*, sp. n., Mouth of the Congo, Bœttger, (...2) p. 194. *N. reclivata*, Say, figured by Dall, (97) pl. xvii. fig. 8. *N.* (*Clithon*) *subocellata*, v. Mart., described and figured ; Schepman (324).

Turbinidæ.

Phasianella brongniartii, Aud., = *P. splendida*, Phil. ; Cooke, (85) p. 262. *P. lineolata*, Wood, = *P. variegata*, Lmk. ; *id. ibid.*

Trochidæ.

Austrocochlea and *Neodiloma*, sectt. nn. *Monodonta* ; for *M. constricta*, Lmk., and *M. æthiops*, Gmel. ; Fischer, (123) p. 820.

Cantharidus episcopus (Hombr. & Jac.), Campbell I., Filhol, (122) p. 526.

Eumargarita, n. n., = *Margarita*, Leach, 1819, *nec* 1814 ; Fischer, (123) p. 825.

Margarita frielei, sp. n., Behring's Sea, Krause, (216) p. 263, pl. xvi. fig. 2 ; *M. vahlii*, Möll., habitat extended to Behring's Sea, *id. t. c.* p. 261 ; *M. helicina*, Fabr., two varieties (*typica*, *campanulata*) distinguished, *id. t. c.* p. 262. *M. rosea* (Hutton), from Campbell Island ; Filhol, (122) p. 527.

Phasianotrochus, sect. n. *Elenchus*. For *E. badius*, Wood ; Fischer, (123) p. 819.

Photinula vaginalis, *P. detecta*, *P. resurrecta*, Santa Cruz, Patagonia, *P. hyadesi*, Tierra del Fuego, *P. pruinosa*, Santa Cruz & Punta Arenas, *P. gamma*, Punta Arenas, *P. paradoxa*, S. of Cape Horn, *P. halmyris*, Beagle Canal, spp. nn., Rochebrune & Mabille, (313) pp. 104–108.

Trochus fragaroides, L., South-west of Portugal ; Nobre (280). *T. cinerarius* from Rabeu Iusel ; Goldfuss, Z. Naturw. (4) iv. p. 666.

Delphinulidæ.

Delphinula nitida, sp. n., Verrill, (367) p. 424, pl. xliv. fig. 11, off Chesapeake Bay, 1400 fath. *Asga*, *Vermilla*, subgg. nn., for *D. gomeya* and *D. muricata* ; Gregorio, (145) pp. 69 & 67.

Cocculinidæ.

Cocculina reticulata, sp. n., *id. t. c.* p. 426, off Chesapeake Bay, 70 fath.

Haliotidæ.

Haliotis huttoni, sp. n., Campbell I., Filhol, (122) p. 527.

Pleurotomariidæ.

Didymodon, sect. n. *Trochotoma*, for *T. quinquecincta*, Zieten ; Fischer, (123) p. 848.

Loxoplocus, subg. n. *Murchisonia*, for *M. tropidophora*, Whiteaves ; *id. t. c.* p. 847.

Pleurotomaria beyrichii, Hilg., described and figured, with refs. to other recent and fossil species; Woodward (381).

Talantodiscus, *Pyrgotrochus*, *Perotrochus*, *Entemnotrochus*, and *Phanerotrema*, sectt. nn. *Pleurotomaria*. Types, *P. mirabilis*, Deslongch., *P. bitorquata*, Deslongch., *P. quoyana*, Fischer & Bernardi, *P. adansonia*, Crosse & Fischer; Fischer, (123) pp. 850 & 851.

Fissurellidæ.

Fissurella dozei, Santa Cruz, Patagonia, *F. hedeia*, Punta Arenas, *F. arenicola*, Punta Arenas and Orange Bay, spp. nn., Rochebrune & Mabille, (313) pp. 108 & 109.

Puncturella abyssicola, sp. n., off Martha's Vineyard, U.S.A., 1500 fath.; Verrill, (367) p. 425.

Proscutum, subg. n., *Scutum*, for *S. compressum* (Desh.); Fischer, (123) p. 861.

DOCOGLOSSA.

Patellidæ.

Nacella strigatella, sp. n., Cape Horn, Rochebrune & Mabille, (313) p. 110.

Patella magellanica, Mart., *P. fuegensis*, Reeve, *P. terroris*, sp. n., *P. campbelli*, sp. n., Filhol, (122) pp. 528 & 529.

Patella meridionalis, Cape Horn, *P. metallica*, *P. pupillata*, Orange Bay, *P. tincta*, Magellan Is., spp. nn., Rochebrune & Mabille, (313) pp. 109 & 110.

Lepetidæ.

Cryptobranchia alba, Dall. Radula figured and described by Krause, (216) p. 259, pl. xvi. fig. 1.

POLYPLACOPHORA.

Chitonidæ.

Fischer (123) classifies the group thus:—1. *Holochiton*, g. n.; 2. *Chiton*, L.; 3. *Anisochiton*, g. n.; 4. *Chitonellus*; 5. *Diarthrochiton*, g. n.

A few notes on the forms collected by the 'Challenger'; *Leptochiton alveolus*, found in great depths in the North Pacific: Haddon (154).

Anisochiton, g. n., for *Chiton fascicularis*, L.; Fischer, (123) p. 881.

Chiton. 3 species from S. Georgia; v. Martens (253) p. 93.

Diarthrochiton, g. n., for *D. vestitus* (Sowerby); Fischer, (123) p. 883.

Holochiton, g. n., including, as subgenera, *Leptochiton*, *Hanleya*, and *Eochiton*, nn.; *id. t. c.* p. 877.

Lepidopleurus longicymbus (Blv.), *L. circumvallatus* (Rv.), *L. campbelli*, sp. n., Campbell I., Filhol, (122) pp. 531–535.

[illegible]phora campbelli, sp. n., Campbell I., *id. t. c.* p. 540.

Tonochiton and *Porochiton*, subgg. nn. of *Chiton*; Fischer, (123) pp. 879 & 880.

Tonicia gryei, sp. n., Campbell I., Filhol, (122) p. 535.

APLACOPHORA.

Chætodermatidæ.

Chætoderma militare, sp. n., Philippine Is., Selenka, (331A) p. 23, pl. iv. figs. 28–32.

SCAPHOPODA.

The name *Solenoconchia* (Solenoconques) to be preferred to *Scaphopoda* and *Cirribranchia*, which are inappropriate; Lacaze-Duthiers (227).

Cadulus spectabilis, sp. n., Verrill, (367) p. 482, pl. xliv. fig. 19, off New England Coast, 1500 fath.: remarkable for its size (22 mm. long). *C. carolinensis*, sp. n., Bush, (60) p. 471, pl. xlv. fig. 19, 7–48 fath.; *C. incisus*, sp. n., *id. t. c.* pl. xlv. fig. 20.

Dentalium leptum, sp. n., *id. t. c.* p. 470, pl. xlv. figs. 18 & 18*a*, 7–48 fath. *D. laqueatum*, sp. n., Verrill, (367) p. 431, pl. xliv. fig. 18, off Chesapeake Bay, 68 fath.

LAMELLIBRANCHIATA.

Pelecypoda, Goldfuss, to be preferred to *Lamellibranchiata*; Smith, (341) p. 2.

Ostræidæ.

Ostræa. Popular account of life-history of; Lockwood, Sci. Monthly, iii. pp. 133–138.

The question whether oysters rest normally on the right or left valve is discussed by Cunningham, Nature, xxxii. p. 597; *op. cit.* xxxiii. p. 12; Stuart-Wortley, *op. cit.* xxxii. p. 625; Hunt, *op. cit.* xxxiii. pp. 8 & 154; Turner, *t. c.* p. 30; Möbius, *t. c.* p. 52 (abstr., J. R. Micr. Soc. vi. p. 52); Ryder, *t. c.* pp. 80 & 81. Green colour of, due to Diatoms; Lankester, (229): see also p. 43. Enemies and parasites of the oyster past and present; White, Science, iii. p. 618. General account of the oyster and oyster industry by Cunningham & Goode, Encycl. Brit. xviii. pp. 106–110.

Oyster Culture. Modes of in various places; Giglioli & Issel, (138) pp. 387–415. Brooks (54) suggests the securing of oyster-fry by floating collectors. Verrill (368) remarks on the length of time oysters will live if suspended and if the edges of the shells be perfect, and recommends transporting them thus.

Description of an oyster basin; De Poincy, Bull. U. S. Fish Comm. v. p. 134. Protection of oysters from starfish; Garman, *t. c.* p. 127. Rate

of growth of oysters, and instructions for fattening; Ryder, *t. c.* pp. & 416. Examination of oyster-beds near New York; Blackford, *t. c.* pp. 53–57.

Spondylidæ.

Spondylus ostreoides, sp. n., S. Pacific, Smith, (341) p. 326, cuts.

Limidæ.

Lima lata, St. Paul's Rocks, Atlantic, Philippines, p. 288, pl. xxiv. fig. 3, *L. tahitensis*, Tahiti, p. 289, pl. xxiv. fig. 4, *L.* (*Limatula*) *torresiana*, spp. nn., N. Australia, p. 291, pl. xxiv. fig. 5, *L.* (*L.*) *confusa*, n. n., = *L. confusa*, Jeffreys, *nec* Woods, Azores, 1000 fath., Pernambuco, and W. Indies, p. 292, pl. xxiv. fig. 6, *L.* (*L.*) *laminifera*, sp. n., W. Indies, p. 293, pl. xxiv. fig. 7; Smith (341).

Pectinidæ.

Amussium dalli, Bermuda, p. 308, pl. xxii. fig. 7, *A. watsoni*, New Guinea, p. 309, pl. xxii. fig. 8, *A. caducum*, p. 309, pl. xxiii. fig. 1, *A. jeffreysii*, p. 310, pl. xxiii. fig. 2, Philippines, *A. torresi*, N. Australia, p. 311, pl. xxiii. fig. 3, *A. scitulum*, S. of New Guinea, p. 312, pl. xxiii. fig. 4, *A. squamigerum*, p. 312, pl. xxiii. fig. 5, *A. obliquum*, p. 313, pl. xxiii. fig. 6, W. Indies, *A. propinquum*, Azores, p. 314, 1000 fath., pl. xxiii. fig. 7, *A. cancellatum*, p. 315, pl. xxiii. fig. 8, Bermuda, W. Indies, *A. meridionale*, p. 316, pl. xxiv. fig. 1, Southern Ocean, 1300–1800 fath., and Pacific, spp. nn., Smith (341).

Pecten noronhensis, p. 296, pl. xxi. fig. 4, Fernando Noronha, *P. amicus*, p. 301, pl. xxi. fig. 6, Tongatabu, *P. kermadecensis*, p. 302, pl. xxi. fig. 7, Kermadec Is., *P. pudicus*, p. 302, pl. xxi. fig. 8, Marion I., 1375 fath., *P. murrayi*, p. 303, pl. xxii. fig. 1, N. Australia, 1400 fath., *P. subhyalinus*, p. 304, pl. xxii. fig. 2, W. of Patagonia, *P. distinctus*, p. 304, pl. xxii. fig. 3, Marion I., *P. aviculoides*, p. 305, pl. xxii. fig. 5, Prince Edward I., *P. culebrensis*, p. 306, pl. xxii. fig. 6, W. Indies, spp. nn., *id. t. c.* (341); *P. undatus*, sp. n., Verrill, (367) p. 444, pl. xliv. fig. 21, off Chesapeake Bay, 1400 fath. *P. bifidus*, Münst., distinct from *P. lucidus*, Goldf., synonymies given; *P. lucidus*, Jeffreys, = *Amussium*: Gregorio (146).

Aviculidæ.

Avicula caledoniensis, sp.n., New Caledonia, Gregorio, (145) p. 123.

Vulsella assabensis, sp. n., Bay of Assab, *id. t. c.* p. 121; *V. caramagnæ*, sp. n., Madrela, *id. ibid.*

Mytilidæ.

Crenella fragilis, sp. n., Verrill, (367) p. 444, off Chesapeake Bay, 70 fath. *C. marionensis*, sp. n., Prince Edward I., Smith, (341) p. 277, pl. xvi. fig. 6.

...gdium meridionale, sp. n., Prince Edward I., *id. t. c.* p. 282, pl. xvii. fig. 2.

Idas dalli, sp. n., W. Indies, *id. t. c.* p. 281, pl. xvi. fig. 10.

Dreissena lacustris, *D. ornata*, spp. nn., Grand Bassam (Congo), Morelet, (268) p. 32, pl. ii. figs. 10 & 11. *D. cochleata*, Nyst, recorded from near Antwerp, with a sketch of the history of the species; Raeymaekers & De Loë (302).

Modiola watsoni, sp. n., Philippines, Smith, (341) p. 275, pl. xvi. fig. 5.

Modiolarca bicolor, sp. n., S. Georgia, v. Martens (253) p. 93. *M. kerguelensis*, sp. n., Kerguelen, Smith, (341) p. 280, pl. xvi. fig. 8.

Myrina coppingeri, sp. n., N. Australia, 1400 fath., *id. t. c.* p. 281, pl. xvi. fig. 9.

Mytilus meridionalis, Southern Ocean, *M. kerguelenensis*, Kerguelen, spp. nn., *id. t. c.* pp. 273 & 274. *M. magellanicus*, Lmk., *M. chorus*, Molina, Campbell I., Filhol, (122) p. 544. *M. pellucidus* and *M. edulis*: remarks on relationship and occasional poisonous qualities of; v. Martens, (256) p. 193; on the last see also Virchow & Salkowsky, p. 43. *M. edulis*: some details of breeding; see M'Intosh, (242), also p. 39. *M. edulis*: account of its reproduction, segmentation of the arms, and free young stage; Wilson, Rep. Brit. Ass. p. 1094.

Arcidæ.

Arca profundicola, sp. n., Verrill, (367) p. 439, pl. xliv. figs. 23 & 23*a*, off Chesapeake Bay, 2000 fath. *A.* (*Barbatia*) *pteroëssa*, p. 262, pl. xvii. fig. 4, N. Pacific, 2050 fath., N. Atlantic, 1675 fath., and W. Indies; *A.* (*B.*) *corpulenta*, p. 263, pl. xvii. fig. 5, N. Australia, 1400 fath., Mid-Pacific, 2425 fath., *A.* (*B.*) *imitata*, N. Pacific, 2900 fath., *A.* (*Acar*) *congenita*, p. 264, pl. xvii. fig. 6, Philippines, *A.* (*Scapharca* ?) *consociata*, p. 266, pl. xvii. fig. 7, Arafura Sea, *A.* (*S.* ?) *inæquisculpta*, p. 267, pl. xvii. fig. 8, *A.* (*S.*?) *culebrensis*, p. 268, pl. xvii. fig. 9, W. Indies, *A.* (*Macrodon*) *dalli*, p. 269, pl. xvii. fig. 10, Japan, spp. nn., Smith (341).

Glomus jeffreysi, p. 248, pl. xxi. fig. 1, *G. simplex*, p. 249, pl. xxi. fig. 2, *G. inæquilateralis*, p. 249, pl. xxi. fig. 3, W. Indies, *G. japonicus*, p. 325, woodcut, Japan, spp. nn., *id. t. c.*

Pectunculus beddomei, sp. n., Bass' Strait, *id. t. c.* p. 252, pl. xviii. fig. 1.

Limopsis marionensis, p. 254, pl. xviii. fig. 2, Marion I., *L. pelagica*, p. 254, pl. xviii. fig. 3, Mid-Atlantic, 1850 fath., off Japan, 345 fath., *L. straminea*, p. 255, pl. xviii. fig. 5, Southern Ocean, *L. torresi*, p. 255, pl. xviii. fig. 4, N. Australia, *L. bassi*, p. 256, pl. xviii. fig. 6, S. Australia, *L. lata*, p. 257, pl. xviii. fig. 7, New Zealand, spp. nn., *id. t. c.* *L. plana* and *L. affinis*, spp. nn., Verrill, (367), pp. 441 & 442, off Chesapeake Bay, 2200 and 197 fath.

Nuculidæ.

Leda semen, p. 231, pl. xix. fig. 2, Brazil, *L. decipiens*, p. 232, pl. xix. fig. 3, *L. inaudax*, p. 233, pl. xix. fig. 4, W. Indies, *L. confinis*, p. 233, pl. xix. fig. 5, Azores, 1000 fath., *L. solidula*, p. 233, pl. xix. fig. 6, Brazil,

L. hebes, p. 234, pl. xix. fig. 7, *L. despecta*, p. 235, pl. xix. fig. 8, W. [illegible], *L. inopinata*, p. 236, pl. xix. fig. 9, *L. ramsayi*, p. 241, pl. xx. fig. 3, off Sydney, *L. novæ-guincensis*, p. 237, pl. xix. fig. 10, *L. corbuloides*, p. 239, pl. xx. fig. 1, S. of New Guinea, *L. watsoni*, p. 238, pl. xix. fig. 11, *L. neæriformis*, p. 240, pl. xx. fig. 2, N. Australia, *L. prolata*, p. 320, cut, N. Pacific, 2950 fath., *L. ultima*, p. 324, cut, Atlantic, 2740 fath., spp. nn., Smith (341).

Malletia arrouana, p. 244, pl. xx. fig. 7, Arrou Is., *M. pallida*, p. 246, pl. xx. fig. 8, S. Atlantic, 2550 fath., *M. veneriformis*, p. 246, pl. xx. fig. 9, Bermuda, W. Indies, *M. cuneata*, p. 247, pl. xx. fig. 10, W. Indies, *M. dunkeri*, Japan, spp. nn., *id. t. c.*

Nucula trigona, sp. n., Verrill, (367) p. 438, off Chesapeake Bay, 1100-1500 fath. *N. niponica*, p. 226, pl. xviii. fig. 8, Japan, *N. torresi*, p. 227, pl. xviii. fig. 9, N. Australia, *N. pernambucensis*, p. 227, pl. xviii. fig. 10, Brazil, *N. culebrensis*, p. 228, pl. xviii. fig. 11, W. Indies, *N. profundorum*, p. 229, pl. xviii. fig. 13, N. Pacific, 2050 fath., spp. nn., Smith (341).

Pleurodon ovalis, S. Wood, is a *Nuculina*; *id. t. c.* p. 230.

Portlandia dalli, sp. n., Behring's Sea, Krause, (216) p. 27, pl. iii. fig. 1.

Sarepta abyssicola, sp. n., N. and S. Pacific, 2050 and 2285 fath., Smith, (341) p. 243, pl. xx. fig. 6.

Yoldia lischkei, p. 242, pl. xx. fig. 4, Japan, *Y. hoylei*, p. 320, cut, N. Pacific, 2900 fath., spp. nn., *id. t. c.*

Trigoniidæ.

Trigonia. Remarks on the recent species, which are reduced to four: Suhm, Chall. Nar. i. p. 462.

Unionidæ.

Unionidæ, list of, from Mississippi Valley; Call (63).

Anodonta. French species classed in 11 different groups; 26 species enumerated, of which the following are new: *A. hecartiana*, *A. thripedesta*, *A. perroudi*, *A. spathuliformis*, *A. euthymeana*, *A. florenciana*, *A. lortetiana*; Locard, (238) viii. *A. alseria*, Lake Alserio, *A. utriculosa*, Udine, *A. anxurensis*, Lake Trasimene, *A. stabilei*, Modena, *A. padana*, Po, *A. pinii*, Po, *A. longirostris*, numerous localities, *A. scapulosa*, Lake Martignana, *A. romana*, Pontine Marshes, &c., *A. leprosa*, Pavia, &c., *A. utinensis*, Udine, *A. villæ*, Lake Garda, *A. paupercula*, Lakes Garda and Como, *A. cristata*, Lakes Oggiono and Annone, spp. nn., Drouët (108). *A. intemerata*, Quiechow, *A. filippiana*, Houpé, *A. fantoziatana*, Quangtung, spp. nn., Heude, (172) pls. lxvii.-lxix. *A. herculeus*, "Gerstford," Darbishire (102), should be Gerstfeldt, but the species was originally described by Middendorf; it is probably = *Dipsas plicatus*: E. A. Smith, J. of Conch. iv. p. 366. Section of organ of Bojanus figured; Cole, Stud. micr. sci. iii. pl. iii.

Cameronia bourguignati, *C. marioniana*, *C. anceyi*, spp. nn., Lake Tanganyika, Bourguignat, (41) pp. 26-30. *C. giraudi*, *C. revoiliana*, spp. nn., same locality, *id.* (41A) p. 107.

[illegible] undosa, sp. n., Brazil, v. Martens, (254) p. 148; see also Rehring (276).

Dipsas occidentalis, sp. n., Sechuan, Heude, (172) p. lxvi.

Microcondylus bonellii, incl. *M. moreleti*, Drouët; *M. truncatus*, sp. n., Lake Garda: Drouët, (108) pp. 110 & 117.

Mutela bourguignati, sp. n., Central Africa, Bourguignat, (41) p. 8. *M. soleniformis*, sp. n., Tanganyika, *t. c.* p. 25. Remarks on the genera *Mutela* and *Iridina*; *id. op. cit.* pp. 9–12.

Mycetopus armatus, Taipingfu, *M. succineus*, Nganhoué, *M. cæruleus*, Nganhoué, *M. viridis*, Nganhoué, *M. triangularis*, Sechuan, spp. nn., Heude, (172) pls. lxx.–lxxii.

Pseudodon aureus, *id. t. c.* pl. lxxii. fig. 140. *P. chaperi*, sp. n., Perak, de Morgan, (270) p. 423, pl. ix. figs. 1 & 2.

Spatha droueti, sp. n., Senegal, near *S. dahomeyensis* and *S. senegalensis*, Lea; Chaper, (72) p. 43, pl. i. figs. 1–3. *S. bourguignati*, sp. n., Central Africa, Bourguignat, (41) p. 12; genus divided into 3 subgenera, *Spatha*, *Spathella*, *Aspatharia*.

Unio polii, Rome, *U. subcylindricus*, Ticino, *U. idrinus*, Lakes Idro and Iseo, *U. etruscus*, Pisa, *U. campanus*, Naples, &c., *U. meridionalis*, Castellamare, *U. langobardus*, Mincio, *U. brianteus*, Lake Santirana, *U. nitidus*, Turin, Modena, *U. siliquatus*, Turin, *U. benacinus*, Lake Garda, *U. minusculus*, Lake Garda, spp. nn., Drouët (108). *U. dokici*, *U. serbicus*, *U. truncatulus*, *U. rivalis*, spp. nn., Servia, *id.* (109). *U. douglasiæ*, Gray, includes *U. dactylinus*, *U. hainanensis*, *U. firmus*, *U. chloreus*, *U. osbeckii*, and *U. nux-persica*; Heude, (172) pls. lxv. & lxv.*bis*. *U. schomburgianus*, sp. n., Central China, *id. t. c.* pl. lxxii. *U. margaritifera* (sub. n. *Margaritana margaritifera*, L.): very full synonymy and description; Borcherding (37) pp. 147–165. *U. zematicus*, Letourn., figured by Issel, (193) p. 13 (= *U. punicus*, Issel). *U. soleilleti*, *U. ilgi*, *U. meneliki*, *U. hamyanus*, *U. alfierianus*, spp. nn., Shoa, Bourguignat, (39) pp. 39–44. *U. calthus*, sp. n., Tanganyika, *id.* (41) p. 23. *U. ratidotus*, p. 166, *U. dumesnilianus*, p. 168, *M. billottianus*, p. 170, *U. euphynus*, p. 172, spp. nn., Bagamoyo, Zanzibar, Charmes (74). *U. vaalensis*, S. Africa, *U. essoensis*, Assinie, spp. nn., Chaper, (73) pp. 480–483, pl. xi. figs. 1–3 & 7–9. *U. perakensis*, sp. n., Perak, de Morgan, (270) p. 424, pl. ix. figs. 3 & 4. *U. æquatorius*, sp. n., Mayumba, Mouth of Congo, Morelet, (268) p. 31, pl. ii. fig. 9. *U. guppyi*, sp. n., Shortland I., Solomon Is., E. A. Smith, (343) p. 608, pl. xxxvii. figs. 8 & 8*b*. *U. jolyi*, sp. n., Algiers, Kobelt, (210) p. 22, pl. xli. fig. 256; *U. mejerdæ*, *U. micelii*, spp. nn., Tunis, *id. t. c.* pp. 23 & 24, pls. xlii. & xliii.: also some two dozen species figured for the first time. *U. margaritiferus*: notes on capture of; Japp, Scot. Nat. viii. pp. 62–64 & 113–115. The formation of a byssus by *Unio* is discussed by Larkin, Science, iii. p. 302, 1884, and Lea, *t. c.* p. 434.

Iridinidæ.

Contains the following genera:—*Mutela*, Scapoli, *Burtonia*, Bourg., *Brazzæa*, Bourg., *Moncetia*, Bourg., *Cameronia*, Bourg., and 11 species; Bourguignat, (41) pp. 37–39.

Brazzæa, g. n. Apices without rugosities, much inflated, [illegible] above, and, as it were, square. Hinge almost none, without denticulations, slender and filiform: two ligaments; three groups of muscular impressions; superior border of the left valve passing beyond that of the right, and projecting upwards in the form of a winged membrane. For *B. anceyi*, sp. n., Tanganyika, *id. t. c.* pp. 32–34.

Moncetia, g. n. Shell inequilateral, almost flat, apices flattened, far forward, without rugosities. Hinge simple, a tubercular eminence on the right valve in the cardinal region, without a corresponding one on the left, and a smooth lateral lamella, as in *Margaritana*: two ligaments, both internal; three groups of muscular impressions. For *M. anceyi*, sp. n., Tanganyika, *id. t. c.* pp. 34–36.

Astartidæ.

Cardita beddomei, p. 211, pl. xv. fig. 5, *C. dilecta*, p. 213, pl. xv. fig. 4, Bass Strait, *C. insignis*, p. 214, pl. xv. fig. 3, S. of New Guinea, spp. nn., Smith (341).

Carditella exulata, p. 215, pl. xv. fig. 6, Tristan da Cunha, *C. capensis*, p. 216, pl. xv. fig. 7, Cape of Good Hope, *C. torresi*, p. 217, pl. xv. fig. 8, *C. infans*, p. 218, pl. xv. fig. 10, S. of New Guinea, *C. angasi*, p. 217, pl. xv. fig. 9, Port Jackson, spp. nn., *id. t. c.*

Crassatellidæ.

Crassatella rhomboides, p. 219, pl. xvi. fig. 1, *C. torresi*, p. 223, pl. xvi. fig. 2, N. Australia, spp. nn., *id. t. c.* *C. paeteli*, sp. n., Gorée, Senegal, Maltzan, (246) p. 30. *C. acuminata*, Singapore, *C. sublamellata*, Japan, spp. nn., Kobelt (212).

Solemyidæ.

Solemya patagonica, sp. n., West of Patagonia, Smith, (341) p. 208, pl. xi. fig. 1.

Leptonidæ.

Lepton costulatum, sp. n., S. Georgia, v. Martens, (253) p. 94.

Tellimya planata, sp. n., Behring's Sea, Krause, (216) p. 34, pl. iii. fig. 6.

Kelliidæ.

Kellia macandrewi, Fischer, from near Brest; Daniel (100). *K. antipodum*, sp. n., Campbell I., Filhol, (122) p. 543. *K. cardiformis*, sp. n., Kerguelen, Smith, (341) p. 202, pl. xi. fig. 6.

Kelliella nitida, sp. n., Verrill, (367) p. 438, off Martha's Vineyard, U.S.A., 1500–2000 fath.

Montacuta angasi, p. 204, pl. xii. fig. 2, Port Jackson, *M. acuminata*, p. 205, pl. xii. fig. 3, N. Australia, *M. cylindracea*, p. 206, pl. xii. fig. 4, N. Atlantic, *M. occidentalis*, p. 206, pl. xii. fig. 5, W. Indies, *M. pura*, p. 207, pl. xii. fig. 6, Azores and Canaries, spp. nn., Smith (341).

Ungulinidæ.

Diplodonta subgranulosa, p. 195, pl. xiv. fig. 7, Philippine Is., *D. sculpta*, p. 196, pl. xiv. fig. 8, *D. corpulenta*, p. 196, pl. xiv. fig. 9, *D. subglobosa*, p. 197, pl. xiv. fig 10, *D. conspicua*, p. 198, pl. xiv. fig. 11, N. Australia, *D. amboinensis*, p. 199, pl. xiv. fig. 12, Amboina, spp. nn., *id. t. c.* *D. lamellata* is a *Lucina* ; *id. t. c.* p. 173.

Lasæa rubra, Mont., found in Iceland, Europe, N. Africa, Canaries, Cape of Good Hope, St. Paul and Kerguelen Is., Japan, Puget Sound, California, S.W. extremity of S. America, and New Caledonia. It is absent from the tropics; Pelseneer (287).

Lucinidæ.

Cryptodon grandis, sp. n., Verrill, (367) p. 436, pl. xliv. fig. 22, off Cape Hatteras, 900–1500 fath. ; *C. plicatus*, sp. n., *id. t. c.* p. 437, off Martha's Vineyard, 1100 fath. *C. watsoni*, p. 188, pl. xiv. fig. 1, Admiralty Is., *C. moseleyi*, p. 189, pl. xiv. fig. 2, S. Atlantic, 1900 fath., *C. falklandicus*, p. 190, pl. xiv. fig. 3, Falkland Is., *C. rufolineatus*, p. 191, pl. xiv. fig. 4, Fiji, *C. luzonicus*, p. 192, pl. xiv., fig. 5, Philippines, *C. marionensis*, p. 199, pl. xiv. fig. 6, Prince Edward I., spp. nn., Smith, (341).

Lucina ramsayi, p. 174, pl. xiii. fig. 2, Port Jackson, *L. cristata*, p. 175, pl. xiii. fig. 3, *L.* (*Divaricella*) *irpex*, p. 176, pl. xiii. fig. 4, Cape York, Australia, *L.* (*Codakia*) *levukana*, p. 181, pl. xiii. fig. 6, Fiji, *L.* (*C.*) *congenita*, p. 182, pl. xiii. fig. 7, N. Australia, *L.* (*C.*) *hawaiiensis*, p. 183, pl. xiii. fig. 8, Honolulu, *L.* (*C.*) *fijiensis*, p. 184, pl. xiii. fig. 9, Fiji, *L.* (*Loripes*) *desiderata*, p. 185, pl. xiii. fig. 10, New Guinea, *L.* (*L.*?) *jacksoniensis*, p. 185, pl. xiii. fig. 11, Port Jackson, *L.* (*L.*?) *gordoni*, p. 186, pl. xiii. fig. 12, Fiji, spp. nn., *id. t. c.*

Chamidæ.

Chama arcinella, L., var. *bonanni*, sp. n. ?, hab. ?, Hanley (161).

Verticordiidæ.

Pecchiolia granulifera, sp. n., Verrill, (367) p. 434, off Chesapeake Bay, 1400 fath.

Verticordia. 18 species referred to this genus by Smith, (341) p. 165; the following are new: *V. australiensis*, p. 167, pl. xxv. fig. 6, Cape York, *V. woodii*, p. 168, pl. xxv. fig. 7, Brazil and W. Indies, *V. quadrata*, p. 169, pl. xxv. fig. 8, Canaries.

Isocardiidæ.

Callocardia (?) *adamsii*, p. 155, pl. vi. fig. 7, Sierra Leone, 2450 fath., *C. pacifica*, p. 156, pl. vi. fig. 9, N. Pacific, 2900 fath., *C. atlantica*, p. 157, pl. vi. fig. 8, off Azores, 1000 fath., spp. nn., Smith (341).

Venericardia obliqua, sp. n., Bush, (60) p. 478, 7–10 fath.

Cardiidæ.

Cardium kobelti, sp. n., Gorée, Senegal, Maltzan, (246) p. 29. *C.* (*Fragum*) *torresi*, sp. n., S. of New Guinea, Smith, (341) p. 164, pl. viii.

Sphæriidæ.

Grandidieria anceyi, *G. insignis*, *G. hauttecœuri*, *G. locardiana*, spp. nn., Tanganyika, Bourguignat, (41) pp. 15–18. A list of 21 known species of this genus is given, *t. c.* pp. 20–23.

Grandidieria does not belong to the *Naiidæ*, but to the *Sphæriidæ*; *Ruellania*, n. n., proposed; Bourguignat, (41B) p. 1. *R. cyrenopsis*, *R. servainiana*, *R. ujijiensis*, *R. gravida*, *R. rostrata*, spp. nn., Lake Tanganyika, *id. t. c.* pp. 9, 6, 7 & 10, pl. i. *R. elongata*, *R. giraudi*, *R. mira*, *R. rotundata*, *R. corbicula*, *R. incarnata*, *R. granulosa*, spp. nn., same locality, *id. t. c.* pp. 95–102.

Pisidium. 19 species from deep water of Swiss Lakes enumerated and discussed by Forel, (133) p. 198. *P. giraudi*, sp. n., Lake Tanganyika, Bourguignat, (41A) p. 105. *P.* sp. indet., found in well near Courtenot; Fischer, (124) p. 36.

Soleilletia, g. n. "A small *Pisidium*, or minute *Sphærium*, provided with the hinge of a *Galatea*, and having a certain marine appearance"; the right valve has one cardinal and two elongated lateral teeth, the left has two cardinals. For *S. abbadiana*, *S. hamyana*, spp. nn., Shoa, Bourguignat, (39) pp. 32–35, figs. 15–19.

Cyrenidæ.

Corbicula soleilleti, *C. callipyga*, *C. gravieriana*, spp. nn., Shoa, Bourguignat, (39) pp. 36–38, figs. 12–14. *C. tanganyikana*, sp. n., Lake Tanganyika, *id.* (41A) p. 104.

Petricolidæ.

Choristodon (?) *cancellatus*, sp. n., Verrill, (367) p. 435, off Chesapeake Bay, 70 fath.

Cyprinidæ.

Cyprina islandica, L., S.W. of Portugal, Nobre (280).

Veneridæ.

Circe barandæ, sp. n., Philippines, Hidalgo (181). *C. bermudensis*, p. 143, pl. ii. fig. 1, Bermuda, *C. jucunda*, p. 144, pl. ii. fig. 3, Australia, *C. amica*, p. 145, pl. ii. fig. 2, Tongatabu, *C. gordoni*, p. 146, pl. ii. fig. 5, Fiji, *C. obliquissima*, p. 149, pl. ii. fig. 6, Australia, spp. nn.; *C. angasi*, n. n., = *C. australis* (Angas), p. 148, pl. ii. fig. 4: Smith (341).

Cytherea (*Callista*) *roseotincta*, p. 136, pl. i. fig. 6, Philippines, *C.* (*Caryatis*) *regularis*, p. 140, pl. i. fig. 8, Australia, spp. nn., *id. t. c.* pp. 136 & 140.

Dosinia mira, sp. n., New Guinea, *id. t. c.* p. 152, pl. i. fig. 3.

Tapes intermedia, Q. & G., Campbell I.; Filhol, (122) p. 543.

Venus philomela, p. 117, pl. ii. fig. 7, Tristan da Cunha, *V.* (*Chione*) *jacksoni*, p. 123, pl. iii. fig. 2, Port Jackson, *V.* (*C.*) *recognita*, p. 125, pl. iii. fig. 5, Philippines, *V.* (*C.*) *lionota*, p. 126, pl. iii. fig. 7, New Guinea,

infans, p. 128, pl. iii. fig. 3, Australia, *V.* (*C.*) *levukensis*, p. 128, pl. iii. fig. 6, Fiji, *V.* (*C.*) *mindanensis*, p. 130, pl. iii. fig. 4, Philippines, spp. nn., Smith (341).

Saxicavidæ.

Davila (?) *subumbonata*, sp. n., Kerguelen, *id. t. c.* p. 82, pl. vi. fig. 1.

Ervilia subcancellata, p. 80, pl. vi. fig. 2, Bermuda, Fernando Noronha, Pernambuco, *E. sandwichensis*, p. 81, pl. xxv. fig. 5, Honolulu, spp. nn., *id. t. c.*

Scrobiulariidæ.

Semele infans, p. 84, pl. v. fig. 1, Australia, *S.* (*Abra*) *brasiliensis*, p. 85, pl. v. fig. 2, Pernambuco, *S.* (*A.*) *philippinensis*, p. 86, pl. v. fig. 3, Philippines, *S.* (*A.*) *regularis*, p. 87, pl. v. fig. 4, Australia, *S.* (*A.*) *profundorum*, p. 88, pl. v. fig. 5, N. Atlantic and Pacific, spp. nn., *id. t. c.*

Tellinidæ.

Galatea congica, sp. n., near *G. truncata*, Dunker, Mouth of the Congo, Bœttger, (32) p. 196.

Tellina (*Macoma*) *consociata*, p. 96, pl. iv. fig. 4, Amboina, *T.* (*M. uruguayensis*, p. 97, pl. iv. fig. 5, off Montevideo, *T.* (*M.*) *arafurensis*, p. 98, pl. iv. fig. 6, Arafura Sea, *T. murrayi*, p. 98, pl. iii. fig. 8, *T. compacta*, p. 99, pl. iii. fig. 9, Australia, *T.* (*Tellinella*) *charlottæ*, p. 100, pl. iv. fig. 1, *T.* (*T.*) *huttoni*, p. 101, pl. iv. fig. 2, Queen Charlotte Sound, *T.* (*Arcopagia*) *elegantissima*, p. 105, pl. iv. fig. 3, Australia, *T. diluta*, p. 108, pl. iv. fig. 7, Australia, *T. languida*, p. 110, pl. iv. fig. 8, Australia, *T. tenuilamellata*, p. 110, p. iv. fig. 9, New Guinea, spp. nn., Smith (341). *T. radiata* (sun clam) eaten in Florida; Stearns, Bull. U. S. Fish Comm. v. p. 311.

Mactridæ.

Mactra incerta, p. 59, pl. v. fig. 7, sp. n., Banda, *M. jacksonensis*, n. n. (= *Trigonella pusilla*, Angas, *nec* Adams), p. 62, pl. v. fig. 9, Port Jackson, Smith (341). *M. cumingiana*, (?) Dkr., described by Bush, (60) p. 475, 15–17 fath.

Anatinidæ.

Anatina aleutica, sp. n., Behring's Sea, Krause (216) p. 38.

Lyonsia arcæformis, sp. n., S. Georgia, v. Martens, (253) p. 94; *L. morgani*, sp. n., Madras, Chaper, (72) p. 50, pl. i. figs. 19–21.

Lyonsiella jeffreysii, p. 73, pl. xxv. fig. 1, Mid-Atlantic, 1850 fath., *L. papyracea*, p. 73, pl. xxv. fig. 2, Southern Ocean, 1950 fath., *L. grandis*, p. 74, pl. xxv. fig. 3, S. Atlantic, 1900 fath., spp. nn., Smith (341).

Neæra subdivided into 13 sections, unnamed, on the basis of the hinge-teeth, by Smith, (341) pp. 35–38; the following are described as new and figured :—*N. patagonica*, W. of Patagonia, p. 39, pl. vii. fig. 5, *N. wollastonii*, off Azores, 1000 fath, p. 40, pl. x. fig. 6, *N. consociata*, W.

Indies and Bermuda, p. 41, pl. ix. fig. 7, *N. azorica*, Azores, 1000[illegible] p. 41, pl. x. fig. 7, *N. meridionalis*, Southern Ocean, 1950 fath., p. 43, pl. ix. fig. 6, *N. filocarinata*, W. Africa, 1750 fath., p. 44, pl. x. fig. 5, *N. capensis*, Cape of Good Hope, p. 45, pl. ix. fig. 5, *N. platensis*, off Rio de la Plata, p. 45, pl. ix. fig. 4, *N. kerguelenensis*, Kerguelen, p. 46, pl. xxiv. fig. 8, *N. angasi*, N. S. Wales, p. 47, pl. ix. fig. 2, *N. fallax*, Cape York, p. 49, pl. x. fig. 2, *N. brazieri*, Port Jackson, p. 51, pl. ix. fig. 3, *N. congenita*, Bermuda, p. 52, pl. x. fig. 1, *N. fragilissima*, off Prince Edward I., p. 53, pl. ix. fig. 1. *N. murrayi*, sp. n., Mid-North Pacific, 2990 fath., *id. t. c.* p. 319, cut. *N. costata*, Bush, (60) p. 472, pl. xlv. fig. 21, 48 fath. *N. paucistriata*, Dall, MS. (nomen tantum), *id. t. c.* p. 473.

Pandora carolinensis, sp. n., *id. t. c.* p. 475, 7–48 fath.

Periploma undulata, sp. n., Verrill, (367) p. 433, off Martha's Vineyard, U.S.A., 800 fath.

Poromya australis, p. 54, pl. xi. fig. 2, *P. lævis*, p. 55, pl. xi. fig. 3, Cape York, spp. nn., Smith (341).

Silenia, g. n. Differing from *Lyonsiella* in possessing well-developed labial palpi, and characters of siphonal opening and foot; shell has an external ligament, without shelly support, and the hinge is edentulous. For *S. sarsii*, sp. n., Southern Ocean, 1950 fath., S. Atlantic, 2050 fath.; *id. t. c.* p. 75, pl. xxv. fig. 4.

Thracia meridionalis, p. 68, pl. vi. fig. 4, Kerguelen, Marion I., *T. watsoni*, p. 69, pl. vi. fig. 5, Australia, *T. myodoroides*, p. 70, pl. vi. fig. 6, Port Jackson, *id. t. c.*

Corbulidæ.

Azara afra, sp. n., Mouth of the Congo, Bœttger, (32) p. 197. The genus is also found fossil in the Jurassic, Wealden, and other formations.

Corbula macgillivrayi, sp. n., New Guinea, p. 30, pl. x. fig. 8, *C. philippii*, sp. n., p. 33, pl. viii. fig. 4, Smith (341). *C. assiniensis*, sp. n., River Assinie, Senegal, Chaper, (72) p. 47, pl. i. figs. 7–9.

Solenidæ.

Solecurtus strigillatus, L., S.-W. of Portugal; Nobre (280).

Gastrochænidæ.

Clavagella torresi, sp. n., Torres St., Smith, (341) p. 28, pl. viii. fig. 1.

Pholadidæ.

Hanley (160) justifies the name *Teredo utriculus*, Gmel., and states that the species may be distinguished from *T. norvegica*, Spengler, by the more leaf-like pallets with shorter stalks, and the greater fragility of the tube. The valves are distinguished by their outline, and by the fang or central portion being broader and shorter. Notes are added upon many of the species described in the Conchologica Iconica; the author stating that he has been unable to find the originals of many figures stated to be drawn from specimens in the British Museum.

BRACHIOPODA.

BY

WILLIAM E. HOYLE, M.A., F.R.S.E.

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2. DALL, W. H. Report on the Mollusks in Report of the International Polar Expedition to Point Barrow, Alaska. Pp. 177–184, 1 pl. Washington: 4to [Brachiopod, p. 183].

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4. JOUBIN, L. Sur l'anatomie des Brachiopodes du genre Cranie. C.R. c. pp. 464–466.

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12. Shipley, A. E. Ueber das Nervensystem der *Argiope*. 1000 ... viii. pp. 25 & 26. 13,

13. Verrill, A. E. Third Catalogue of *Mollusca*, recently added to the Fauna of the New England Coast and the adjacent parts of the Atlantic. Tr. Conn. Ac. vi. pp. 395–452, pls. xlii.–xliv. [*Brachiopoda*, pp. 445 & 446].

Anatomy and Physiology.

Lankester (8) considers the *Sipunculoidea*, *Brachiopoda*, and *Polyzoa* as equivalent branches of a newly-constituted phylum "*Podaxonia*," the arms of the Brachiopod being regarded as homologous with the Polyzoan lophophore.

Blochmann (1) substantiates Hancock's statement that the heart of *Terebratulina* and *Waldheimia* is a contractile organ. In the former it pulsates 30 times in 30–40 seconds. It contains branched muscle-cells. The veins described by Hancock are lacunæ between the two layers of the mesentery; his "afferent brachial canal" is the supra-œsophageal arm-nerve. Furthermore, the plexuses described by Hancock are branched connective tissue-cells, not vessels. A brachial vessel, sending branches to the cirri, runs behind the œsophagus and gives off branches which open into a sinus surrounding the œsophagus. Heart and vessels have practically the same distribution in seven species examined, but are somewhat different in *Crania anomala*. Here there are two larger and several smaller cavities at the posterior end of the so-called "veins," of very simple structure; there are also differences in the brachial vascular system. The heart in *Argiope*, though not mentioned by Schulgin and Shipley, is easy to find, and occupies the same position as in other forms. In *Argiope neapolitana* there are two such hearts (= the supra-œsophageal ganglia of Schulgin). In *Crania* there are two pairs of straight, three of oblique muscles, and one unpaired median. The mantle margin has no bristles, and there is a median posterior anus. The nervous system is, on the whole, correctly depicted by Van Bemmelen. *Crania* has no proper supra-œsophageal ganglion, but only a slender commissure; lateral commissures were not found.

The upper shell of *Crania* is traversed by pores which ramify into very fine apertures on the outer surface; the ventral valve is only perforated where there are no muscular insertions; at these points the shell is covered by calcified cartilage. The outer layer of the mantle is composed of similar substance, with a layer of spongy tissue between it and the shell; the other surface is clothed by ciliated epithelium. The inner layer of the mantle is occupied by the genital organs. There are three principal pairs of muscles; the anterior and posterior are adductors, the third is oblique, and serves to thrust the free valve forwards or sideways; the arms are sustained by other muscles. The cirri are cartilaginous tubes, covered externally by ciliated epithelium; internally they are lined by an epithelium continuous with that of the brachial canals. Respiration is effected by the mantle, and there is no special circulatory

There is a nerve collar round the œsophagus, and the brachial nerves are the largest ; JOUBIN (4).

No anatomical work upon *Discina* has appeared since that of Owen in 1835. The mantle which lines the valves is perforated by ramifying canals, which arise by four trunks from the general cavity ; their branches open into a large intra-pallial lacuna, and their extremities into a circular vessel which runs round the margin of the mantle ; here numerous bristles are inserted arising from glandular follicles. Under the visceral mass is situated the peduncle, which is a kind of oval sac attached by its upper face to the mantle, and by the lower adhering like a sucker to the subjacent rock. Its walls are flexible, and it contains three vertical muscles and a circular one. The arms are formed—(1) of a solid, immovable portion, attached to the body by a large base, and (2) of a slender flexible portion situated above the first. The first turn of the arm is attached to the visceral mass ; its curvature is dorsal, thus differing from that of other inarticulate Brachiopods. There is a double row of cirri along the arms. The musculature of *Discina* resembles that of *Lingula* rather than that of *Crania* ; a table showing the muscular homologies is given. The digestive tract presents a long narrow œsophagus, followed by an ovoid stomach, into which three ducts from the large liver open. The intestine forms a complete bend, then turns to the right and expands, and after a thin S-shaped portion opens through a wide rectum at the side of the body. As in *Lingula*, the digestive tract is not sustained by a vertical membrane. The nervous system consists of a slender œsophageal collar, from the dorsal side of which are given off three pairs of nerves, of which the first goes to the arms, the others to the muscular and digestive organs. The genital glands form two distinct groups, attached to the gastro- and ileo-parietal membranes ; they are bulky, and have an arborescent framework of connective tissue. The oviducts consist of a pair of laminated spaces ; they lead into a long canal situated between the anterior adductor muscles and the wall of the body, and opening not far from the base of the arms ; JOUBIN (5).

SHIPLEY (12) replies to criticisms of Schulgin on his paper on *Argiope*, and claims that his description is more accurate and complete than that of the latter.

According to KRUKENBERG (7), chitin is more extensively distributed in Brachiopods than in Cephalopods. In *Lingula anatina* it not only forms the chief constituent of the calcified skeleton, but also the thick elastic sheath of the peduncle and the supporting framework of the internal organs.

TESTICARDINES.

TEREBRATULIDÆ.

Platidia anomioides (Scacchi), having been found already on both sides of the Atlantic, is recorded from San Diego and Todos Santos Bay, California, by Orcutt, (9) p. 551. Specimens from the various localities are compared by Dall, *ibid.*

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Terebratulina caput-serpentis, *Terebratella spitzbergensis*, I
T. caput serpentis, N.E. Portugal, Nobre (9).
Megerlia truncata, N.E. Portugal, *id. ibid.*

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xliv. [*Brachio-*

Rhynchonellidæ.

Atretia gnomon, Eastern Coast of U. S. A., 1500 fath., Ver
Rhynchonella (*Hemithyris*) *psittacea* (Ch.), D'Orb., Poi
Dall, (2) p. 183 ; from the White Sea, Herzenstein (3) ; fr
Sea, Krause, (6) p. 15 ; Tromsö, Schneider (11).

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ECARDINES.

Discinidæ.

Discina atlantica, East Coast of U. S. A., 1100–2000 fath

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POLYZOA.

BY

GEORGE ROBERT VINE.

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24. ——. On the use of the Avicularian Mandible in the of the Cheilostomatous *Bryozoa*. J. R. Micr. Soc 774–779, pl. xiv.

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GENERAL MORPHOLOGY.

Writing of the mandibles of species of *Polyzoa*, Wate (24) p. 777, that "certain processes in the mandibles of *Cellepo Adeona* indicate differences in the muscular attachments, and tha the muscular system, together with the opercula, which has the gre classificatory value."

Important points in the structure of the operculum in spec of *Membranipora* are pointed out by Waters, (23) p. 282, and he that "it seems clearly advisable to include in one family or forms in which the operculum is fixed in the flexible membrane the zoœcial area (opesia, Jullien), as in *M. angulosa* and *M. branacea*; whereas those like *Micropora uncifera*, Busk, which complete operculum placed in a corresponding aperture with a calcar border, should be placed in another."

Ostroumoff (13) suggests that the calcareous skeleton is formed in the ectoderm either as a subskeletal layer (*Membranipora*), or as two layers, between which is the skeleton (*Lepralia*). This preliminary paper concludes with some observations upon the metamorphosis of the *Bryozoa* illustrated by a diagram of "Probryozoon."

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The *Polyzoa* collected during the cruise of the 'Willem Barents' h ng been studied by Vigelius (17), and detailed particulars of the morph be

...ra membranaceo-truncata, Smitt, and *Barentsia bulbosa*, Hincks, have been published in a most complete monograph.

Nicholson & Foord (11) draw attention to a species of *Fistulipora*, in all probability identical with *Berenicea megastoma*, M'Coy.

Affinity of the Polyzoa.

Speaking of the affinity of the *Polyzoa* with other organisms, Harmer says (2) the *Entoprocta*—larval and adult—are true Trochospheres, and that the nervous system of *Loxosoma* develops in almost exactly the same manner as that of *Dentalium*. The *Entoprocta* have certain affinities with *Actinotrocha*; but the gut flexure differs from that of the adult *Phoronis*. To the *Brachiopoda* the affinity is more doubtful than to *Phoronis*, but the nearest allies of *Entoprocta* are the Trochosphere larvæ of *Mollusca*, or *Chætopoda*, and the adult *Rotifera*; and his conclusions are that the *Entoprocta* form the most archaic of the groups of the *Polyzoa*, their relation to other forms being somewhat doubtful.

Lankester (6) thinks that the *Polyzoa* are probably more closely ... to the Sipunculoid Gephyrean worms than to any other group ... kingdom; but he recognizes the extreme difficulty of ... facts of their ontogeny.

...orm described by Fewkes, (1) p. 305, and supposed by him ... to the Annelid group, and regarded as forming a connecting link between the Annelids and the *Polyzoa*, Harmer pronounces to be (2) "simply a very characteristic larval *Loxosoma*."

In his investigations of the Cyphonautes-stage of *Membranipora repiachowi*, sp. n., and *M. denticulata*, Busk., Ostroumoff (12) says that the "enigmatical" organ of Schneider is nothing but the "internal sac" filled with a substance which afterwards spreads out on the surface and becomes an adhesive membrane.

Ctenostomata.

Vigelius, (17) p. 104 *et seq.*, considers, with Salensky, the crown of the *Pedicellina* not as the equivalent of a polypide, but as the homologue of a polypo-cystide, of which the stalk is an integral part, and he would thus deal with the structure of *Barentsia*.

Entoprocta.

The anatomy and morphology of the adult *Loxosoma* have been worked out by Harmer, (2) pp. 261–337. The species investigated are *L. crassicauda*, *L. pes*, *L. singulare* (?), and *L. leptoclina*, sp. n. The adult *Loxosoma* possess a large sub-œsophageal ganglion, hitherto described as a part of the generative apparatus. The excretory organ (paired) probably begins with a flame cell; and the nephridia are completely

homologous with the head kidneys of Trochosphere larvæ. [illegible] maphrodite individuals were discovered in any species of *Loxosoma* or *Pedicellina*.

Urnatella gracilis (Leidy). Some specimens of this species have been described, (7) p. 282 *et seq.*, nearly all of which consisted of two stems of unequal length and devoid of terminal polyps. In March the stems had all developed polyps at the distal end. Most were terminated by a single polyp, but a few had also a smaller one on a cylindrical joint springing from the ante-penultimate joint of the stem. If portions of the stem are destroyed, the remaining joints are capable of reproducing the polyps. Branches usually spring from the last one or two joints, newly produced from that which immediately supports the terminal polyp. Heads may start laterally from old or mature joints. Thus the latter appear to serve as the "statoblasts" of other fresh-water *Polyzoa*, but ordinarily they do not become isolated from one another.

Lankester (6) describes in detail the structure of *Paludicella ehrenbergii*. The terms "ectocyst," "endocyst," and "endosare" are rejected, and after a brief account of the different groups of the *Polyzoa*, the author passes on to the consideration of their genealogical relationship. [illegible]ck are [illegible] vessel, sending [illegible]ff branches [illegible] vessels

Fresh-water Polyzoa.

Of *Plumatella hyalina* and *lophoposidea*, Klafka (5) re[illegible] first is allied to *P. vesicularis* [= *Hyalinella vesicularis*, Ju[illegible] below)] by the transparency of its tubules, which arise radially from a centre and branch dichotomously at some distance from it. The second species apparently resembles *Lophopus*, but the gelatinous investment of the mass is an ectoblast membrane, while the organization of the cells and polypides is that of *Plumatella*. *Fredericella sultana*, with two varieties, are common in Bohemian waters. *Alcyonella fungosa* has two kinds of statoblasts. Of *Cristatella mucedo* the author remarks that for a long time he was unable to convince himself of the locomotive powers of the species.

Jullien (4) recognizes two sub-classes, in the former of which there are two tribes:

Bryozoa Lophoda.

I.—*B. lophopoda-caduca.*
- (α) Family *Pedicellinidæ.*
- (β) „ *Loxosomidæ.*

II.—*B. lophopoda-perstita.*
- (α) Family *Plumatellidæ.*
- (β) „ *Lophopusidæ.*
- (γ) „ *Rhabdopleuridæ.*

B. Infundibulata.
- (α) Family *Paludicellidæ.*
- (β) „ *Hislopidæ.*

A new genus, *Hyalinella*, is instituted for *Plumatella vesicularis*, Leidy, p. 133.

GENERA AND SPECIES.

The following classification is adopted by Lankester (6):

PODAXONIA.

Class I. *Sipunculoidea.*
„ II. *Brachiopoda.*
„ III. *Polyzoa.*
Section 1. *Vermiformia—Phoronis.*
„ 2. *Pterobranchia—Rhabdopleura, Cephalodiscus.*
„ 3. *Eupolyzoa.*
Sub-class 1. *Ectoprocta.*
Order 1. *Phylactolæma—Lophopus, Plumatella.*
„ 2. *Gymnolæma.*
Sub-order I. *Cyclostoma—Crisia, Hornera, Tubulipora.*
„ II. *Ctenostoma—Alcyonidium, Vesicularia.*
„ III. *Chilostoma—Cellularia, Bagula, Flustra, Eschara, Cellepora.*
Sub-class 2. *Entoprocta—Pedicellina, Loxosoma, Urnatella.*

CHEILOSTOMATA.

CATENARIIDÆ.

Catenicella gracilenta, sp. n., Port Phillip Heads, (9) p. 106, pl. i. fig. 3.

CELLULARIIDÆ.

Maplestonia, g. n. "Zoarium consisting of series of single and geminate cells, connected by distinct, corneous tubes. Cells with the front wholly occupied by a membranous area, or with the lower part filled in; imperforate behind. No avicularia or vibracula." *M. cirrata*, sp. n. (?), Portland, Maplestone, Warrambool, Watts, (8) p. 99, pl. i. figs. 9 & 9*b*, *simplex*, sp. n., Port Phillip Heads, (9) p. 107, figs. 2 & 2*b*.

Canda tenuis, sp. n., Port Phillip Heads, (9) p. 107, pl. iv. figs. 1 & 1*b*.

BICELLARIIDÆ.

Beania wilsoni, sp. n., Port Phillip Heads, (9) p. 108, pl. ii. figs. 1 & 1*a*.

URCEOLIPORIDÆ.

Substituted in MS. for *Gemellariidæ* in the text.

Urceolipora dentata, sp. n., Port Phillip Heads, (9) p. 109, pl. i. figs. 1 & 1*b*.

Flustridæ.

Carbasea reticulum, Hincks, var. (?), Port Phillip Heads, (9) p. 109, pl. iv. fig. 2.

Diachoris elongata, Hincks, Napier, New Zealand, (3) p. 244, pl. ix. fig. 1, *quadricornuta*, Hincks, Australia, *costata*, Busk, Falkland Is., *t. c.* pl. ix. figs. 2 & 4, *magellanica*, Busk, New Zealand, *t. c.* pl., figs. 2–2*d*. In the same paper Hincks refers to 16 species and varieties of *Diachoris*, as known to him up till March, 1885.

Membraniporidæ.

Membranipora bimammilata, sp. n., *porcellana*, sp. n., Portland, (9) p. 110, pl. ii. figs. 2, 3 & 3*a*; *valdemunita*, Hincks, Napier, New Zealand, (3) p. 248, pl. vii. fig. 2; *hians*, Hincks, *acuta*, Hincks, New Zealand, *t. c.* pp. 248 & 249, pl. vii. figs. 5 & 6; *trifolium* form *minor*, Bahia, Tahiti, (3) p. 255, pl. viii. fig. 7. *M. repiachowi*, sp. n., and *M. denticulata*, Busk, A. Ostrooumoff, (12) p. 219 *et seq.*

Fossil *Membranipora*. *Membranipora aperta*, Busk, Aldinga (Al.*), (23) p. 286, pl. vii. fig. 3; *circularis*, D'Orb., = *Flustrina id.*, D'Orb., = ? *M. tuberculata*, Busk, Riv. Murray Cliffs (R. M. Cl.*), *t. c.* p. 286; *savartii*, Aud., R. M. Cl. (?), *t. c.* (several synonyms, pp. 286 & 287); *radicifera*, Hincks, R. M. Cl., *t. c.* p. 287; *rhynchota*, Busk, Al., *t. c.* p. 287, pl. vii. fig. 1; *temporaria*, sp. n., R. M. Cl., *t. c.* p. 288, pl. vii. fig. 16. *Membranipora* (*Amphiblestrum*) *flemingii*, Bk., Al.; *cylindriformis*, Waters; *parvicella*, T. Woods, = *selenaria, id.*, R. M. Cl.; *michaudiana*, D'Orb., = *Cellepora id.*, D'Orb., Al.; *trifolium*, Busk, var. *propinqua* = *Lepralia trifolium*, McGil., 1868, R. M. Cl., *t. c.* pp. 288 & 289.

Diplopora. "When I proposed [(8) p. 105] the genus *Diplopora* for Mr. Hatton's *Membranipora cincta*, I was not aware that the name had already been used. I would therefore alter it to *Diploporella*, McGil."

Microporidæ.

Fossil *Micropora*. *Micropora* (?) *patula*, Waters, = *Steganoporella patula*, Waters, R. M. Cl., (23) p. 290, pl. vii. fig. 4; *perforata*, McGill., = *Membranipora perforata.*, McGil., Al., *t. c.* p. 290. *Steganoporella magnilabris*, Busk, R. M. Cl.; *rozieri*, Aud., var. *indica*, Hincks, *t. c.*, p. 292.

Salicornariidæ.

Cellaria rigida, sp. n., Port Phillip Heads, (8) p. 99, pl. i. figs. 1 & 2; *australis*, sp. n., but redescribed, *t. c.* pl. i. figs. 1 & 2. Fossil *C. malvinensis*, Busk, = *Salicornaria immersa*, T. Woods; *angustiloba*, Waters, Al., (23) pp. 285 & 286.

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* Both localities abbreviated in remainder of text.

Tubucellariidæ.

Tubucellaria ceroides, Ell. & Sol., Port Phillip Heads, (9) p. 107, pl. i. fig. 4. McGil. places the above in the previous family, remarking that the "zoarium consists of cylinders branched exactly as in *Cellaria australis*, but rising from the sides by flexible corneous tubes."

Myriozoidæ.

Schizoporella biserialis, Hincks, = *arachnoides*, McGil., Napier, N. Z., (3) p. 250, pl. vii. fig. 3; *cribrillifera*, Hincks, Crooks St., N. Z., *t. c.* p. 250, pl. viii. fig. 5; *scintillans*, Hincks, N. Z., *t. c.* p. 251, pl. ix. fig. 7; *lucida*, Hincks, Australia, *t. c.* p. 252, pl. ix. fig. 7; *circinata*, McGil., Napier, N. Z., *t. c.* pl. vi. fig. 1; *argentea*, Hincks, Africa and Tahiti, *t. c.* p. 254, pl. ix. fig. 6 (see also 'Annals,' 1881, pl. ix. fig. 6); *cryptostomata*, sp. n., Port Phill. (3).

Fossil *Schizoporella*. *S. vulgaris*, Moll.; *simplex*, Johnst., var. *aldingensis*, Al., *phymatopora*, Reuss., = *Myriozoum honolulense*, Busk; *striatula*, Smith, = *Gemellipora id.*, Sm.; *fenestrata*, Waters; *cecilii*, Aud.: all R. M. Cl., (23) pp. 300 & 301; *protensa*, sp. n., Al., *t. c.* p. 301, pl. vii. fig. 14.

Mastigophora duterrei, Aud., R. M. Cl., *t. c.* p. 301.

Rhynchopora bispinosa, Johnst., R. M. Cl., *t. c.* p. 302.

? *Hippothoa* sp. n., resembles *H. expansa*, Dawson, and "reminds me of *Schizoporella hyalina*," Hincks, (3) pl. viii. fig. 4.

Porinidæ.

Porina coronata, Reuss., = *Haswellia australiensis*, Busk., R. M. Cl., Ald., (23) p. 297.

Cribrilinidæ.

Fossil *Cribrilina*. *Cribrilina radiata*, Moll. (*nec* D'Orb.), R. M. Cl.; *figularis*, = *C. philomela*, Bk., var. *adnata*, Bk., Johnst., R. M. Cl.; *terminata*, R. M. Cl., (23) pp. 292 & 293.

Microporellidæ.

Microporella malusii form *disjuncta*, Hincks, N. Z., (3) p. 249, pl. vii. fig. 4; *diadema*, McGil., form *angustipora*, Hincks, *t. c.* p. 249, pl. viii. fig. 3; *scandens*, sp. n., = *Alysidota ciliata*, McGil., (9) p. 111, pl. iv. fig. 7; *diadema*, McGil., *t. c.* p. 111, pl. iv. fig. 3–6. The following varieties of this species are given by the author:—var. *lunipuncta*, var. *longispina*, var. *lata*, var. *canaliculata*, *t. c.* pp. 111 & 112.

Fossil *Microporella*. *Microporella grisea*, Lamx., = *Adeona grisea*, Lamx., = *Dictyopora grisea* and *cellulosa*, McGil., &c., Waters, (23) p. 294; *coscinopora*, Reuss., var. *mucronata*, McGil., *violacea*, Johnst.,

var. *fissa*, Hincks, *symmetrica*, Waters, *ferrea*, Waters, *t. c.* p. 25- *liformis*, sp. n., R. M. Cl., *t. c.* p. 295, pl. viii. fig. 8 ; *magna*, T. Woods, = *Lunulites id.*, T. Woods, Al., *t. c.* p. 295, pl. vii. fig. 7 ; *elevata*, T. Woods, = *Eschara id.*, R. M. Cl., *t. c.* p. 296, pl. vii. figs. 6 & 9 ; *M.* (*Diporula*) *magnirostris*, McGil., R. M. Cl., *t. c.* p. 296.

Monoporellidæ.

Fossil sp. *Monoporella crassatina*, Waters, = *Lepralia japonica*, Busk, Al., R. M. Cl., (23) p. 291 ; *sexangularis*, Goldf., Al., R. M. Cl., Mr. Waters gives several synonyms, *t. c.* p. 291, pl. vii. fig. 2.

Escharidæ.

Lepralia cincta, Hincks, New Zealand, (3) p. 254, pl. viii. fig. 6 ; *gigas*, Hincks, Trincomalee, *vestita*, Hincks, Tahiti, Fiji Is., *t. c.* pp. 255 & 256, pl. ix. figs. 8 & 9 ; *poissonii*, Aud., Bass St., Tahiti, New Zealand, *id. t. c.* p. 254 ; *subimmersa*, McGil., Warnambool, *id. t. c.* p. 254, pl. viii. fig. 1.

Fossil *Lepralia*. *Lepralia edax*, Busk, *depressa*, Bk., var., *rostrigera*, Smitt, *escharella*, Ramer, *burlingtoniensis*, Waters, *subimmersa*, McGil., Australia, (23) pp. 297–299 ; *confinita*, sp. n., Ald., (23) p. 299, pl. vii. fig. 10.

Smittia tatei, T. Woods, R. M. Cl., Al., (23) p. 299, pl. vii. fig. 15 ; *landsborovii*, Johnst., *reticulata*, McGil., *seriata*, Reuss., *t. c.* p. 300 ; *milneana*, Busk., var. *coæquata*, var. n., Al., *t. c.* p. 300.

Celleporidæ.

Lekythopora hystrix, McGil., (9) p. 113, pl. ii. fig. 6 ; also fossil, (23) p. 308.

Cellepora munita, sp. n., (9) p. 113, pl. ii. fig. 5 ; *longirostris*, sp. n., *platalea*, McGil., *costazii*, Aud., *serratirostris*, sp. n., *megasoma*, McGil., *rota*, sp. n., all Port Phillip Heads, *id. t. c.* pl. iii. figs. 1–6.

Fossil sp. *Cellepora coronopus*, S. Wood, *avicularis*, Hincks, *costata*, McGil., Al. and R. M. Cl., (23) pp. 302 & 303 ; *divisa*, sp. n., Mt. Gambier, woodcut, *t. c.* pp. 303 & 304 ; *mamillata*, Busk, *albirostris*, Smitt, R. M. Cl., *pertusa*, Smitt., Al., and *pertusa* var. *ligulata*, R. M. Cl., *t. c.* pp. 304 & 305 ; *biradiata*, sp. n., R. M. Cl., *t. c.* p. 306, pl. vii. figs. 11 & 12 ; *tridenticulata*, Busk, *t. c.* p. 306 ; *fossa*, Haswell, R. M. Cl., woodcut, *fossa* var. *marsupiata*, var. n., R. M. Cl., woodcut, *t. c.* pp. 307 & 308.

Selenariidæ.

Cupularia canariensis, Busk, Al., (23) p. 308.
Selenaria maculata, Busk, R. M. Cl., (23) p. 309.

Cyclostomata.

Crisiidæ.

Crisia unipara, D'Orb., Australia, 1, (22) p. 683, pl. xxx. fig. 1.

Tubuliporidæ.

Stomatopora granulata, M.-Edw., var. *minor*, var. n., Foss. Aust., (22) p. 688; *dichotoma*, Lamx., (18) p. 786, fig. 1; *waltoni*, J. Haime, Juras. Richmond, *t. c.* p. 787.

Tubulipora concinna, sp. n., (8) p. 101, pl. i. fig. 10; *pulchra*, *connata*, *clavata*, spp. nn., all Port Phillip Heads, *t. c.* pp. 102 & 103, pl. ii. figs. 1-3; *lucida*, sp. n., Port Phillip Heads, Portland, (9) p. 116, pl. v. fig. 1.

Idmonea atlantica, Forbes, Austr. Foss., 4 loc., *milneana*, D'Orb., Aust., 3 loc., *radians*, Lamk., Aust., 1 loc., (22) pp. 683 & 684; *hochstetteriana*, Stol., Aust., 3 loc., *t. c.* p. 684, pl. xxx. figs. 12 & 13; *bifrons*, sp. n., Aldinga, *t. c.* p. 685, pl. xxx. figs. 10 & 11; *aldingensis*, sp. n., *t. c.* p. 696; *triquetra*, Lamx., Juras. Richmond, (18) pp. 789 & 790.

Entalophora verticillata, Goldf., Mt. Gambier, Aust., *neocomiensis*, D'Orb., Aust. Foss., 5 loc., = *raripora*, D'Orb., Aust. Foss., 7 loc., (22) pp. 686 & 687; *straminea*, Phill., Juras. Richmond, (18) p. 791; *richmondiensis*, sp. n., and var. *pustulopora*, var. n., Juras. Richmond, *t. c.* pp. 791 & 792, woodcut.

Filisparsa orakeiensis, Stol., Aust. Foss., 4 loc., (22) p. 687.

Diastopora lineata, *fasciculata*, spp. nn., Port Phill. Heads, (8) pp. 103 & 104, pl. iii. figs. 1 & 2; *bicolor*, sp. n., Port Phill. Heads, (9) p. 117, pl. v. fig. 2; *suborbicularis*, Hincks, Muddy Creek, Foss. Aust., *patina*, Lamk., Mt. Gambier, Aust. Foss., (22) p. 689; *deluviana*, Lamx., *microstoma*, Mich., and var. *connectans*, var. n., *lamourouxi*, Juras., Richmond, (18) pp. 787-789.

Terebellaria? *increscens*, sp. n., Juras. Richmond, (18) p. 793, woodcut.

Horneridæ.

Hornera frondiculata, Lamx., = *H. porosa*, Stoliczka, (22) pp. 687 & 688, foss., Riv. Mur. Cl., Mt. Gambier and Curdie's Creek, Australia; *foliacea*, McG., (22) p. 688, pl. xxxi. fig. 18, foss., Riv. Mur. Cl., &c., and both living in Australia.

Incertæ sedis.

Phyllopora tumida, sp. n., (21) p. 109, figs. 1*a* & *b*, Caradoc beds, Wern-y-scadog, Llanfyllen; (10) p. 153.

Thamniscus antiquus, sp. n., (21) p. 111, figs 2*a-d*, Bala Rocks? or age, Middleton Hill, near Welshpool; (10) p. 154.

Woods,

Lichenoporidæ.

Radiopora pustulosa, D'Orb., = *R. bulbosa*, D'Orb.; (20) p. 851, figs., & p. 852, foss., Greensand.

Lichenopora paucipora, sp. n., (20) p. 853, fig. (and *ibid.* Q. J. Geol. Soc. May, 1885, p. 113), Cambridge, Greensand; *phillipsii*?, Haime, (18) p. 794, Jurassic; *hispida*, Flem., *radiata*, Aud., *cochloidea*, D'Orb., *boletiformis*, D'Orb., *nec* Rss., = *Tecticavea id.*, D'Orb., *variabilis*, D'Orb., *aldigensis*, sp. n., (22) pp. 694–696, foss., S. Australia.

Favosipora, g. n. "Zoarium adherent, raised at intervals in irregular, elevated, rounded ridges, with a distinct lamina. Cells large, of unequal size, closely packed, prismatic." *F. rugosa*, sp. n., (8) pl. ii. fig. 3; allied to *Densipora corrugata*, and forcibly suggestive of some forms of *Discoporella radiata*, Aud.

Other species of the *Lichenoporidæ* are described by Waters in his paper on the fossil *Cyclostomata*, (22) pp. 689–693, but under the following old generic terms:

Reticulipora transennata, sp. n., pl. xxx. figs. 2, 3, 6, & 7, sp. *R. dorsalis*?

Discotubigera clypeata, Lamx., = *Pelagia clyp.*, Mich., = *Pseudesia clyp.*, Haime; *iterata*, sp. n., pl. xxxi. figs. 14–17.

Pavotubigera flabellata, D'Orb., = ? *Semitubigera lamellosa*, D'Orb.; *dimidiata*, Rss., = *Defrancia dim.*, Rss.; *P. gambierensis*, sp. n., pl. xxx. fig. 9, p. 692.

Defrancia exaltata, sp. n., pl. xxxi. p. 692.

Supercytis? *digitata*, D'Orb., pl. xxxi. figs. 22–26 & 27, p. 692.

Frondiporidæ.

Fasciculuria conjuncta, sp. n., (22) p. 692, pl. xxx. figs. 4 & 5.

Heteropora conifera, Lamx., (18) p. 794.

Heteropora sp. (? *H. pelliculata*, Waters), Aldinga, (22) p. 696.

CRUSTACEA.

BY

G. Herbert Fowler, B.A., Ph.D.

I.—LIST OF PUBLICATIONS.

1. *Aurivillius, C. W. S. Krustaceer hos Arktiska Tunikater. Vega Exp. Vet. Iakt. iv. p. 223.

2. ——. Crustacés parasites des Tuniciers arctiques. Extr. in Bull. Soc. Z. Fr. x. pp. 281 & 282.

Beck. [See Lankester (87).]

3. Beddard, F. E. Note on the Distribution of the Genus *Serolis*, and its occurrence on the Shores of New Zealand. N. Z. J. Sci. ii. pp. 388–390.

Originated probably in the southern hemisphere, and spread northward.

4. ——. Preliminary Notice of the *Isopoda* collected during the Voyage of H.M.S. 'Challenger.' Part ii., *Munnopsidæ*. P. Z. S. 1885, pp. 916–925.

14 new species, and 1 new genus; with remarks on distribution.

5. Bell, F. J. Comparative Anatomy and Physiology. London: 1885, 12mo.

6. Beneden, E. van. Sur la présence à Liège du *Niphargus puteanus*. Bull. Ac. Belg. viii. pp. 650–652.

Finds them sensitive to and troubled by light, despite the absence of ocular pigment.

Benham. [See Lankester (87).]

7. Bert, P. Animaux d'eau douce dans l'eau de mer. C.R. Soc. Biol. 1885, ii. p. 525.

Experiments on Daphnids.

8. Blanc, H. Développement de l'œuf chez la *Cuma rathkii*. Rec. Z. Suisse, ii. pp. 253–274.

Eggs formed from a germinal syncytium, general development resembling that of the *Isopoda*.

9. Boas, J. E. V. Bemerk. über *Apseudes*. Morph. JB. xi. p. [illegible], "Zur Abwehr gegen Prof. Claus." [*Vide* Claus (30).]

10. Bölsche, W. Ueber *Prestwichia rotundata*. JB. Ver. Osnabr. vi pp. 268–271.

11. *Bovallius, C. A New Isopod from the Swedish Arctic Expedition of 1883. Stockholm : 1885, 8vo. Bih. Sv. Ak. Handl. x. No. 9. [*Aegiochus*, g. n.]

12. ——. *Mimonectes*, a Remarkable Genus of *Amphipoda Hyperidea*. Upsala [separate copy] : 1885, 4to. N. Act. Ups. (3) xiii. (1886) art. 4.

New genus, necessitating foundation of new fam. The animal mimics *Medusæ* to a remarkable extent.

13. *——. A New Isopod from the Coast of Sweden. Stockholm : 1885, 8vo. Bih. Sv. Ak. Handl. x. No. 10.

14. Brooks, W. K. Notes on the *Stomatopoda*. J. Hopk. Univ. Circ. v. No. 43, and Ann. N. H. (5) xvii. p. 166 ; also J. R. Micr. Soc. 1886, p. 69.

Finds an *Erichthus* larva change into *Lysiosquilla* ; describes burrows of *Lysiosquilla* and *Squilla empusa*, with stridulation of the latter audible above the surface of the water.

15. Brooks, W. K., & Bruce, A. T. Abstract of Researches on the Embryology of *Limulus polyphemus*. J. Hopk. Univ. Circ. v. No. 43.

Bruce. [See Brooks (15).]

16. *Budde-Lund, G. *Crustacea Isopoda* per familias et genera et species descripta. Hauniæ : 1885, 8vo, pp. 319.

Eubelum, g. n. ; *Rhyscotus*, *Scleropactes*, subgg. nn.

17. *Butschinsky, P. *Parapodopsis cornuta*. Protok. Soc. Nouv. Russ. x. 1, p. 11.

18. Camerano, L. Distribuzione dei colore nel regno animale. Mem. Acc. Tor. xxxvi. pp. 329–356. [Also J. R. Micr. Soc. 1885, p. 37.]

19. Carnoy, J. B., Gilson, G., & Denys, —. La Cellule : Recueil de Cytologie et d'Histologie générale. Lierre : 1885, sm. fol., t. i. fasc. 1 & 2.

I. Spermatogénèse chez les Arthropodes (188 pp., 8 pls.), by G. Gilson ; *Oniscus*, *Asellus*, *Gammarus*, p. 140 *et seq.* II. Cytodiérèse chez les Arthropodes (432 pp., 7 pls.), by J. B. Carnoy ; *Squilla*, *Crangon*, *Portunus*, *Astacus*, &c., p. 307 *et seq.*

20. Carrière, J. Die Sehorgane der Thiere. München und Leipzig : 1885, large 8vo, 205 pp. [*Crustacea*, pp. 154–194 ; *Limulus*, p. 131.]

21. ——. Einiges ü. d. Sehapparate von Arthropoden. Biol. Centralbl. 1885, v. pp. 589–597.

22. Carus, J. V. Prodromus Faunæ Mediterraneæ. t. i. pars 2. Stuttgart : 1885, 8vo.

Crustacea, pp. 289–522. Gives classification, definition, and habitat of all recorded Mediterranean species.

ERS, V. T. Larva of *Estheria mexicana*. Am. Nat. xix. p. 190.

24. CHILTON, C. *Teraticum typicum*. N. Z. J. Sci. ii. p. 320.

Belongs to *Scba* (Costa).

25. ——. A New Species of *Idotea*. Ann. N. H. (5) xv. pp. 123–147. [Also N. Z. J. Sci. ii. p. 321.]

26. ——. On Polymorphism in the *Amphipoda*. Ann. N. H. (5) xvi. pp. 368–376, and N. Z. J. Sci. ii. pp. 560–562. [Also J. R. Micr. Soc. 1885, p. 997.]

Unites *Aora* and *Microdeutopus* under *Aora typica*, the males being polymorphic, and hence differently described as *A. typica* (Kröy.), *M. maculatus* (Chilt.), and *M. mortoni* (Haswell).

27. CLAUS, C. Z. Prioritäts-reclamation d. Dr. Y. Delage. Zool. Anz. viii. p. 356. [*Vide* DELAGE (33).]

28. ——. Neue Beiträge zur Morphologie der Crustaceen. Arb. z. Inst. Wien, vi. pp. 1–105. [Also in J. R. Micr. Soc. 1885, p. 803.]

Formulates anew the Phylogeny of *Crustacea*. He denies that *Phyllopoda* are in any way ancestral to the *Malacostraca*, and that *Nauplius* and *Zoœa* can claim to be anything but secondary larval types; and regards *Nebalia* as wholly unconnected with the *Phyllopoda*.

29. ——. Lehrbuch der Zoologie. 3rd edition. Marburg und Leipzig: 1885, 8vo.

Crustacea, pp. 343–402.

30. ——. Zur Beurtheilung des *Apseudes*-Artikels des Herrn Boas. Morph. JB. xi. p. 316. [*Vide* BOAS (9).]

31. *CZERNIAVSKY, V. *Crustacea Decapoda* Pontica littoralia. Charcoviæ: 1884, 8vo, 269 pp., 7 pls.

32. DAMES, —. *Loriculina noetlingi*. SB. nat. Fr. 1885, pp. 151–156.

A new Cirrhiped from the Senonian of Lebanon.

33. DELAGE, Y. Sur l'appareil circulatoire des Schizopodes. Zool. Anz. viii. pp. 239 & 509.

A claim for priority against Prof. Claus.

34. ——. Système nerveux chez le *Peltogaster*. C.R. c. pp. 1010–1012, and Ann. N. H. (5) xv. pp. 495–498.

A single ganglion giving off fine branches, in a different position to that of *Sacculina*.

DENYS. [See CARNOY (19).]

35. *DOLLO, L., Resumé par. La *Nebalia* et ses parents Palæozoiques. Bull. Sci. Nord, vii. & viii. p. 111.

36. ETHERIDGE, R., WOODWARD, H., and JONES, T. R. On the Fossil *Phyllopoda* of the Palæozoic Rocks. Rep. Brit. Ass. 1884, pp. 75–95.

List and description of species.

37. Ewing, L. A Hermaphroditic Crab. Am. Nat. xix. p. [illegible] Woods, *nectes hastatus.*]

38. Faxon, W. A List of the *Astacidæ* in the U. S. National Mus. P. U. S. Nat. Mus. viii. pp. 356–361.

39. ——. A Revision of the *Astacidæ*. Pt. i. The Genera *Cambarus* and *Astacus*. Mem. Mus. C. Z. x. No. 4.

Full descriptions of all known species, and plates of the new forms described in P. Am. Ac. 1884, for which see Zool. Rec. xxi. *Crust.* pp. 17 & 18.

40. Filhol, H. Observations relatives aux espèces du genre *Paramithrax*, vivant en Nouvelle Zélande. Bull. Soc. Philom. ix. p. 26.

Also notes on the following new species:—*Pilumnus novæ-zelandiæ*, p. 26; *Hymenicus edwardsii, H. cooki, H. haasti*, p. 43; *Elamene longirostris*, p. 45; *Halicarcinus huttoni*, p. 45; *Petrolisthes novæ-zelandiæ, P. stewarti*, p. 46; *Porcellano-pagurus edwardsii*, g. & sp. nn., with similarities to *Porcellanidæ* and *Paguridæ*, p. 47; *Allorchestes stewarti, A. campbellica*, p. 54.

42. *——. Considérations relatives à la Faune des Crustacés de la Nouvelle Zélande. Paris: 1885, 8vo. [Extr. de la Bibl. haut. étud. xxx.]

43. Fischer, P. Cirrhipèdes de l'Archipel de la Nouvelle Calédonie. Bull. Soc. Z. Fr. ix. No. 6, pp. 355–360.

Finds in all 15 species, of which 9 are universally distributed, and 6 confined to the Indo-Pacific region.

44. Forbes, H. O. A Naturalist's Wanderings in the Eastern Archipelago. London: 1885, 8vo.

Land-forming habits of *Crustacea*, p. 25 *et seq.*

45. Forel, F. A. La faune profonde des lacs Suisses. N. Denk. schw. Ges. xxix. Abth. 2, pp. 234.

Littoral *Crustacea*, p. 80; pelagic, 88–93; deep-water, 112–117; forms derived from subterranean springs, 170.

46. Frenzel, J. Ueber d. Darmkanal d. Crustaceen nebst Bemerkungen z. Epithelregeneration. Arch. mikr. Anat. xxv. pp. 137–190. [Also J. R. Micr. Soc. 1885, p. 994.]

Histological and physiological research.

47. Friedenfels, E. v. Weitere Beobachtungen über *Artemia salina* und die Salzburger Soolenteiche. Verh. siebenb. Ver. xxxv. pp. 24–31.

48. Giesbrecht, W. *Crustacea*. Zool. Jahresb. 1884, Abth. ii. 57 pp.

49. Giles, G. M. *Cyrtophium calamicola*, a new tubicolous Amphipod from the Bay of Bengal. J. A. S. B. liv. pt. ii. 1885, pp. 54–58.

The structure and habits of this new species.

50. Giles, G. M. A New Species of *Melita*. *T. c.* pp. 59–71.

Gilson. [See Carnoy (19).]

[illegible], E. A. Stud. über *Podophthalmata* Braziliens. Zool. Anz. viii. p. 662.

52. Gotch, F., & Laws, J. P. On the Blood of *Limulus polyphemus*. Rep. Brit. Ass. 1884, pp. 774–776.

Blood drawn so as not to be in contact with air did not turn blue. Analysis given.

53. Graber, V. Ueber die Helligkeit und Farbenempfindlichkeit einiger Meerthiere. Anz. Ak. Wien, 1885, pp. 48 & 49.

Experiments on *Idotea* and *Gammarus*.

54. Griffiths, A. B. Uric Acid Crystals from the Green Gland of *Astacus fluviatilis*. P. R. Soc. xxxviii. pp. 187 & 188. [Also in J. R. Micr. Soc. 1885, p. 805.]

Obtained uric acid and traces of guanin from this gland.

55. Guerne, J. de. Le rade de Dunkerque. Rev. Sci. ix. p. 11.

56. Gulland, G. L. Coxal gland of *Limulus* and of *Arachnida*. Q. J. Micr. Sci. 1885, xxv. pp. 511–520.

In the young *Limulus* the gland is a typical nephridium, such as occurs in *Peripatus*.

57. Haacke, W. Wollkrabben und ihre Mäntel. Zool. Gart. xxvi. p. 37.

Finds Ascidians on S. Australian *Dromiæ*; and thinks that they are derived in larval stages from those on the mother-crab, and regards the similarly placed sponges of European forms as similarly derived.

58. ——. Die Farbe der Tiefseekrabben, &c. Biol. Centralbl. v. pp. 367–369.

Regards the red pigment as being at the bottom of all the colours, which may be obscured by secondary pigments, but reasserts itself when, as in boiled specimens or species from great depths, these latter are removed.

59. Hadfield, H. W. Loss of Limbs in Stalk-eyed *Crustacea*. Zool. (3) ix. p. 191.

On the question of lobsters "shooting" their claws.

60. Halliburton, W. D. Chitin in the cartilages of *Limulus* and *Sepia*. Q. J. Micr. Sci. 1885, xxv. pp. 173–182.

Finds true chitin in the mesoblastic entosternite, and also in the liver of *Limulus*.

61. Hartog, M. M. Morphology of *Cyclops*, and the Relations of the *Copepoda*. Abstracts only in Zool. Anz. viii. p. 301, and J. L. S. xviii. p. 332; also in J. R. Micr. Soc. v. p. 452.

Anatomy of *C. brevicornis* to be treated at length; in discussion of their phylogenetic position, regards *Copepoda* as the most ancestral of *Crustacea*.

62. Haswell, W. A. Notes on the Australian *Amphipoda*. P. Linn. Soc. N. S. W. x. p. 95–112.

Additional notes to former descriptions, and formation of some new species.

63. Henderson, J. R. Recent Additions to the Invertebrate ... Woods, the Firth of Forth. P. Phys. Soc. Edinb. 1885, p. 307.

64. ——. New Species of *Galatheida* collected during the 'Challenger' Expedition. Ann. N. H. (5) xvi. pp. 407–421.

65. Herdman, W. A. A Phylogenetic Classification of Animals. London: 1885, 8vo.

Crustacea, p. 46 *et seq.* and map.

66. Hilgendorf, F. Eine Krebskrankheit. SB. nat. Fr. 1885, pp. 127–130.

In 1884 found *Mycelia* plentiful in *Astacus*; in 1885 they were absent, but *Distomum cirrhigerum* was present in large numbers.

67. ——. Eine neue Isopoden-Gattung. *T. c.* pp. 185–187.

68. Hoek, P. P. C. Beiträge z. Kenntniss d. Anatomie d. Cirrhipedien. Tijdschr. Nederl. Dierk. Ver. (1) vi. pp. 64–142. [Also J. R. Micr. Soc. 1885, p. 641.]

Brings forward some information, supplemental to his 'Challenger' Report, on the complemental male of *Scalpellum* and its *Cypris*-form, and also on the segmental organs, eye, cement apparatus, etc., of the various genera.

69. Howell, W. H. The Chemical Composition of the Blood of *Limulus polyphemus*. J. Hopk. Univ. Circ. v. No. 43.

Four albumens in the serum, resembling paraglobulin, the copper probably compounded with one of these. The coagulation starts from the corpuscles.

70. Howes, G. B. Atlas of Practical Elementary Biology. London: 1885, sm. fol.

Astacus fluviatilis, pls. viii.–x.

71. Imhof, O. E. Ueber d. "blassen Kolben" der Süsswasser Calaniden. Zool. Anz. viii. pp. 353–356. [Also J. R. Micr. Soc. v. p. 997.]

Shows relation between the left, and shorter right antennæ of male *Heterocope* and *Diaptomus*.

72. ——. Pelagische Thiere aus Süsswasserbecken in Elsass-Lothringen. Zool. Anz. viii. p. 720.

73. Ishikawa, C. On the Development of *Atyephira compressa*. Q. J. Micr. Sci. xxv. pp. 391–428.

74. Johnston, R. M. *Entomostraca* in the Travertin Beds, Geilston. P. R. Soc. Tasm. 1884, p. 224.

75. Jones, T. R. The *Ostracoda* of the Purbeck Formation, with notes on the Wealden species. Q. J. Geol. Soc. xli. pp. 311–353.

Finds 14 species in the Purbeck, of which 7 are new; description of all, and figures of the new species; also new varr. of former species.

76. ——, & Kirkby, J. W. On the Palæozoic Bivalve *Entomostraca*, No. xix. Ann. N. H. (5) xv. pp. 174–191.

Descriptions and figures of Carboniferous sp. of the genus *Kirkbya*.

…ES, T. R., & KIRKBY, J. W.] Notes on the Carboniferous *Ostracoda* of the N.W. of England. Geol. Mag. (3) ii. p. 535.

Species from the borders of Lancashire and Westmoreland ; of 7 new forms future accounts are promised.

78. ——, & WOODWARD, H. Notes on the British Species of *Ceratiocaris*. *T. c.* pp. 385–397 & 460–467, with figs. of *C. papilio* and *stygia*.

JONES. [See also ETHERIDGE (36).]

79. KERVILLE, H. DE. Crustacés Schizopodes de l'Estuaire de la Seine. Bull. Soc. Rouen, 1885. pp. 89–98.

80. KINGSLEY, J. S. Notes on the Embryology of *Limulus*. Q. J. Micr. Sci. xxv. pp. 521–576.

Takes up several points previously untouched, pointing strongly in the direction of the Arachnid character of *Limulus*.

KIRKBY. [See JONES (76, 77).]

81. KOCH, G. A. Zur Krebspest in Oberösterreich. Circ. deutsch. Fisch. Ver. 1885, p. 75.

82. KOEBEL, C. Carcinologisches. SB. Ak. Wien, xc. 1, pp. 312–323.

Descriptions and figures of 3 new species.

83. KOEHLER, R. Un Isopode nouveau. Ann. Sci. Nat. xix. No. 1, 7 pp.

84. KRUKENBERG, C. F. W. Vergleichende Physiologische Vorträge, IV. Physiologie der Thierischen Gerüstsubstanz. Heidelberg : 1885, 8vo.

Analysis of chitin, p. 201 *et seq*.

85. LACAZE-DUTHIERS, H. DE. *Laura gerardiæ*, type nouveau de Crustacé parasite. Mem. Ac. Sci. xlii. pp. 160, pl. viii.

The anatomy and development of a parasite on *Gerardia* (= *Gorgonia tuberculata*), probably belonging to the *Cirrhipedia*.

86. LANKESTER, E. R. A New Hypothesis as to the Relationship of the Lung-book of *Scorpio* to the Gill-book of *Limulus*. Q. J. Micr. Sci. 1885, xxv. pp. 339–342.

That the gill-book of *Scorpio* is equivalent to the introverted lung-book of *Limulus*.

87. LANKESTER, BENHAM, & BECK. The Muscular and Endoskeletal Systems of *Limulus* and *Scorpio*. Tr. Z. S. xi. pp. 311–384.

A description and comparison of these systems, tending in the main to the Arachnid character of *Limulus*.

88. LOVETT, E. Notes on British Stalk-Eyed *Crustacea*. Zool. (3) ix.

A series of notes, in various numbers, on anatomy and habits.

89. °LUCAS, H. *Ourozeuktes oweni* (M.-Edw.). Bull. Soc. Ent. Fr. v. 1, p. 58.

90. *[Lucas, H.] Note relative au genre *Lucasius*, Isopodes. iv. 4, p. 137.

91. MacMunn, C. A. On the Chromatology of the Blood of some Invertebrates. Q. J. Micr. Sci. xxv. pp. 469–490.

Unable to detect any bands in spectrum of blood of *Homarus*, *Cancer*, *Carcinus*, *Astacus*.

92. Maillard, G. Invertébrés du Purbeckien du Jura. Abh. schw. pal. Ges. xi. [*Cypris*, pp. 28 & 29.]

93. *Malé, M. L'Écrevisse ; différentes espèces, reproduction, élevage, &c. Paris : 1884, 8vo.

94. Martens, E. von. Bericht ü. d. Leistungen in der Naturgeschichte der Crustaceen während 1884. Arch. f. Nat. xli. p. 239, and Deutsche e. Z. xxix. p. 3.

95. Matthew, G. F. The Geological Age of the Acadian Fauna. Rep. Brit. Ass. 1884, p. 742.

The Acadian trilobites agree better with the Sobra than with the Menevian group.

96. ——. The Primitive Conocoryphean. *T. c.* p. 743.

97. ——. The Fauna of the St. John Group. Tr. R. Soc. Canada, ii. sect. 4, pp. 99–124.

Account of species, with comparison of development of *Conocoryphea* and *Paradoxides*.

Meinert. [See Schiödte.]

98. Melland, B. Histology of the Striped Muscle Fibre. Q. J. Micr. Sci. xxv. pp. 371–390.

Deals with the muscles of *Homarus* among others.

99. Mercanti, F. Sullo sviluppo postembrionale della *Telphusa fluviatilis*. Bull. Soc. Ent. Ital. 1885, pp. 209–216.

Has common features with *Astacus* and *Megalopa*.

100. Miers, E. J. A New Variety of *Thelphusa*. P. Z. S. 1885, pp. 237 & 238.

101. ——. On the species of *Micippa* and *Paramicippa*. Ann. N. H. (5) xv. pp. 1–13.

Restricts genus *Paramicippa* to the single sp. *P. tuberculosa* = *M. parvirostris* (Miers) ; and allows six species, *M. cristata*, *mascarenica*, *philyra*, *spinosa* and var. *affinis*, *curtispina*, *thalia* with varr. *miliaris* and *aculeata*.

102. Miklouho-Maclay, N. de. The Barometro Araucano from the Chiloe Islands. P. Linn. Soc. N. S. W. viii. p. 462.

Shell of *Lithodes antarcticus* so hygroscopic as to be used for a barometer.

103. McIntosh, W. C. The *Annelida Polychæta*. Rep. Voyage H.M.S. 'Challenger,' Zoology, vol. xii.

Accounts of parasitic *Crustacea* [*vide infrà*, p. 27].

ERDOCH, J. Seven new species of *Crustacea* and one Worm from Arctic Alaska. P. U. S. Nat. Mus. vii. pp. 518–522.

105. ——. Report of the Expedition to Point Barrow, Alaska. Washington : 1885, large 4to [*Crustacea*, pp. 136–151].

106. NASSONOW, N. Zur Embryonalentwicklung v. *Balanus*. Zool. Anz. viii. pp. 44–46. [Abstr. J. R. Micr. Soc. 1885, p. 643.]

Finds that a polar body is formed after the laying of the ovum ; of the two blastomeres resulting from the first segmentation, one gives rise to the ectoderm, the other to the endoderm ; invagination epibolic, proctodæum eventually formed close to blastopore.

107. *NINNI, A. P. Sulla ricomparsa dei Gambari (*Astacus fluviatilis*) nel Trevigiano. Treviso : 1885, 8vo.

108. NOLL, F. C. Leben der Krebse im Meere. Zool. Gart. xxvi. p. 91.

On the scavenging functions of crabs.

109. *NORDQUIST, O. Om förekomsten af Ishafscrustacéer uti mellersta Finlands sjöar. Medd. Soc. Fenn. xi. p. 28.

110. *——. Beitrag zur Kenntniss der inneren männlichen Geschlechtsorgane der Cypriden. (Dissert.) Helsingfors : 1885, 4to, 41 pp., 6 pl. [Act. Soc. Sc. Fenn. xv.]

111. NÖTLING, F. Crustaceen aus dem Tertiär Aegyptens. SB. Ak. Berlin, 1885, pp. 487–497.

Several new species, *vide Decapoda*, Palæontology.

112. OSBORNE, H. L. Metamorphosis of *Limulus polyphemus*. J. Hopk. Univ. Circ. v. No. 43.

113. PACKARD, A. S. Carboniferous *Xiphosura* new to N. America. Am. Nat. xix. pp. 291–294.

Describes briefly the limbs of *Cyclus* and *Euproops* hitherto unknown, which resemble those of the larval *Limulus*.

114. ——. The *Syncarida*. *T. c.* pp. 700–703. [Abstr. from Mem. Nat. Ac. Sci.]

Places the *Syncarida* (*Acanthotelson*) near the base of the *Thoracostraca*, and near *Stomatopoda* and *Schizopoda*.

115. ——. The *Anthracaridæ*. *T. c.* pp. 880 & 881. [Abstr. from *op. cit.*]

A new family of *Decapoda Macrura* for the reception of *Anthrapalæmon*.

116. ——. The *Gampsonychidæ*, an undescribed Family of fossil Schizopod *Crustacea*. *T. c.* pp. 790–793. [Abstr. from *op. cit.*]

Erects this new family for the genera *Palæocaris* and *Gampsonyx*, Carb., and suggests that they, descended from such a form as *Acanthotelson*, are ancestors of living *Schizopoda*.

117. ——. Embryology of *Limulus polyphemus*. P. Am. Phil. Soc. xxii. p. 268, and Am. Nat. xix. pp. 722–726. [Also J. R. Micr. Soc. 1885, p. 806.]

Regards *Limulus* as standing in a separate class from both *Tracheata* and *Crustacea*. Description and figures of one stage only.

118. [Packard, A. S.] On the Structure of the Brain of the-eyed *Crustacea*. Mem. Nat. Ac. Sci. iii. p. 99, and Abstract in Nat. xix. pp. 85 & 86; also J. R. Micr. Soc. 1885, p. 238; 1886, p. 69.

Compares the brains of *Asellus communis* and of the blind *Cecidotea* from wells and caves. They differ merely in the presence or absence of the optic ganglia and nerves, the latter disappearing in degeneration before the retina, pigment, and lens.

119. °Pelseneer, P. Notice sur un Crustacé de la craie brune des environs de Mons. Bull. Mus. Belg. iv. pp. 37–46.

120. ——. The Nervous System of *Apus*. Q. J. Micr. Sci. xxv. pp. 433–444. [Abstr. J. R. Micr. Soc. 1885, p. 805.]

Clearly shows brain of *Apus* to be a syncerebrum, the ganglia of the first antennæ being fused with the primitive supra-œsophageal ganglia. The ganglia of the second antennæ and maxillipeds are still microscopically recognizable.

121. °Plateau, F. Note sur des Crustacés et des Myriapodes recueillis par M. Weyers aux environs d'Aguilas, Espagne. C.R. ent. Belg. xlviii. pp. 260 & 261.

122. ——. Force absolue des muscles des Invertébrés. Arch. Z. expér. iii. p. 189.

Noticed in Zool. Rec. xxi. *Crust.* p. 5.

123. Plessis-Gouret, G. du. La faune profonde des lacs Suisses. N. Denk. schw. Ges. xxix. Abth. 2 [*Crustacea*, pp. 43–48].

124. Poppe, S. A. Die freilebenden Copepoden des Jadebusens. 1. Abh. Ver. Brem. ix. 2, pp. 167–206.

125. Quenstedt, F. A. Handbuch der Petrefaktenkunde. 3rd ed. Tübingen : 1885, 8vo [*Crustacea*, pp. 393–470].

126. Rathbun, R. A Crab Invasion at Cuba. Science, vi. p. 132.

27. ——. The Fishery Industries of the United States. Section i., Useful Aquatic Animals. Washington : 1884, 4to.

Crustacea, pp. 763–829; reports on use by man, habits, life-history, etc.

128. Raveret-Wattel, M. C. Sur la maladie des Écrevisses. Bull. Soc. Acclim. ii. pp. 614–633.

129. Richard, M. Action de la cocaïne sur les Invertébrés. C.R. c. p. 1409.

Experiment on *Daphnia*.

130.° Riggio, G. Appunti di Carcinologia Siciliana sul *Polycheles doderleinii*. Nat. Sicil. 1885, pp. 99–104 & 140–146.

Proposes to divide the fam. *Eryontidæ* into 2 sub-famm. : *Erionini* and *Polychelini*, fossil and recent. *Polych. dod.* = *P. typhlops* (Heller).

[illegible]ABATIER, A. Spermatogénèse des Crustacés Decapodes. C.R. c. pp. 391–393. [Also J. R. Micr. Soc. 1885, p. 237.]

Finds "protospermatoblasts" formed from proliferation of the testicular epithelium, which by direct genesis give origin to "deutospermatoblasts," in their turn converted into spermatozoa.

132. SARS, G. O. The *Schizopoda* collected by H.M.S. 'Challenger.' Chall. Rep. Zool. xiii. 228 pp., 38 pls.

In addition to the description of species, gives very complete account of the larval changes of *Euphausiidæ*, recognizing *Nauplius*, *Metanauplius*, *Calyptopis*, *Furcilia*, *Cyrtopia*, the last 3 having been named by Dana as distinct genera, p. 149. Gives also an account of "the accessory eyes" of *Euphausiidæ*, showing them to be phosphorescent organs, p. 70.

133. ——. Den Norske Nordhavs Expedition, 1876–1878, xiv. 1*a* & 1*b*. 280 pp., 21 pls., map.

Describes the new and imperfectly-known *Crustacea* dredged during this expedition, of which preliminary notices have been given in some cases.

134. °——. On some Australian *Cladocera* raised from dried mud. Christiania: 1885, 8vo, 46 pp., 8 pls.

135. SCHIMKEWITSCH, W. Bemerk. ü. d. Entwick. d. Flusskrebses. Zool. Anz. viii. pp. 303 & 304. [Also J. R. Micr. Soc. 1885, p. 805.]

Description of early stages of development of *Astacus leptodactylus*, not markedly different from those of *Palæmon* (Bobretsky).

136. SCHIÖDTE, J. C., & MEINERT, F. Symbolæ ad monographiam Cymothoarum, Crustaceorum Isopodum familiæ. iv. *Cymothoidæ*, trib. 3. *Livonecinæ*. (Additamenta, ind. systematicus, ind. alphabeticus.) Nat. Tids. xiv. 3, pp. 353–454.

137. SCHMIDT, F. Revision der Ost-Baltischen Trilobiten. Abth. ii. *Acidaspiden* und *Lichiden*. Mém. Ac. Pétersb. xxxiii. 1, 127 pp., 6 pls.

138. °SCHNEIDER, J. S. *Pontocrates norvegicus* (Boeck) und *Dexamine thea* (*id.*), ein Beitrag zur Kenntniss der Amphipoden des Arktischen Norwegens. Tromsö: 1885, 8vo.

139. SÈDE, P. DE. Le *Bopyre* du *Palémon*. La Nature, 1885, pt. ii. p. 35.

140. SIMON, E. Exploration Scientifique de la Tunisie. Crustacés. Paris: 1885, 8vo, 21 pp.

Several new species are described.

141. °SMITH, A. C. Notes on the Lobster, *Homarus americanus*. Bull. U. S. Fish Comm. v. pp. 121–125.

142. SMITH, S. J. A New Crustacean allied to *Homarus* and *Nephrops*. P. U. S. Nat. Mus. 1885, pp. 167–169, and Ann. N. H. (5) xvi. pp. 233–236. [Also J. R. Micr. Soc. 1885, p. 807.]

Eunephrops bairdii, g. & sp. nn.

143. [Smith, S. J.] Some Genrea and Species of *Penæidæ*, from Dredgings of the U. S. Fish Comm. P. U. S. Nat. Mus. viii. pp. 170–190.

Erects g. n. *Parapenæus* from *Penæus*, and describes the species falling under it.

144. Spence-Bate, C. On the Geographical Distribution of the Macrurous *Crustacea*. Rep. Brit. Ass. 1884, pp. 753–758.

145. Spencer, W. B. The Urinary Organs of the *Amphipoda*. Q. J. Micr. Sci. xxv. Suppl., pp. 123–138. [Also J. R. Micr. Soc. 1885, p. 640.]

Finds the cæca at the junction of mid- and hind-gut to be hypoblastic, on histological grounds; and probably excretory in function.

146. Stebbing, T. R. R. A new English Amphipodous Crustacean. Ann. N. H. (5) xv. pp. 59–62.

Recognizes *Cyproidia* (Haswell) and *Stegoplax* (Sars) as identical, the former having priority.

147. St. Loup, R. Sur les Parasites de la *Mœna vulgaris*. C.R. ci. p. 175. [Also J. R. Micr. Soc. 1885, p. 805.]

Anilocra edwardsi, sp. n.

148. Thomson, G. M. New *Crustacea*. N. Z. J. Sci. ii. pp. 576 & 577.

149. ——. Parasitic *Crustacea*. *T. c.* p. 455.

150. Ueber die Ursachen der Krebspest. Natur, 1885, p. 491, quoted from Prof. Rauber.

151. Urbanowicz, F. Zur Entwicklungsgeschichte der Cyclopiden. Zool. Anz. vii. pp. 615–619. [Also J. R. Micr. Soc. 1885, p. 641.]

Development of *C. elongatus, quadricornis*, &c.; preliminary notice only.

152. Varigny, H. de. Un cas de Mimetisme. Rev. Sci. x. 3.

Lambrus angulifrons? mimics the coarse sand on which it is found.

153. ——. Tétanos rhythmique dans les muscles d'invertébrés marins. C.R. Soc. Biol. 1885, i. pp. 751 & 752.

Experiments on *Portunus* and *Pagurus*.

154. Wagner, N. Die Wirbellosen des Weissen Meeres. Leipzig: 1885, fol.

Lists of *Crustacea* from the Solowetzky Bay, White Sea, p. 42.

155. Walcott, C. D. Palæozoic Notes: New Genus of Cambrian Trilobites, *Mesonacis*. Am. J. Sci. xxix. p. 328.

156. Walter, A. *Anceus* (*Praniza*) *torpedinis*. Jen. Z. Nat. xviii. pp. 445–451.

A new species, occurring in the spiracles of a *Torpedo* from Ceylon.

WEAVES, J. F. A Decapod Crustacean from U. Cretaceous of Highwood River, N.W.T. Tr. R. Soc. Canada, ii. sect. 4, pp. 237 & 238.

158. WHITFIELD, R. P. A very large species of *Homalonotus* from the Oriskany Sandstone. Bull. Am. Mus. Nat. Hist. i. pp. 193–195.

159. WILLIAMS, H. S. A New Limuloid Crustacean from the Devonian. Am. J. Sci. xxx. p. 45.

160. WOOD, W. Transplanting Lobsters to the Chesapeake; experiments upon the temperature they can endure. Bull. U. S. Fish Comm. v. No. 2, pp. 31 & 32.

161. WOOD-MASON, J. Blind Brachyurous *Crustacea*. P. A. S. B. 1885, viii. p. 104. [Also J. R. Micr. Soc. 1886, p. 69.]

162. *——. On *Nephropsis*. P. A. S. B. 1885, v. pp. 70–72.

163. WOODWARD, H. On some Palæozoic Phyllopod Shields; and on *Nebalia* and its allies. Geol. Mag. (3) ii. pp. 345–352.

[See also JONES (78) and ETHERIDGE (36).]

164. WRIGHT, R. A Parasitic Copepod of the Clam. Am. Nat. xix. pp. 118–124. [Also J. R. Micr. Soc. 1885, p. 239.] [*Vide Corycæidæ*.]

165. ZACHARIAS, O. Zool. Untersuch. zweier Hochgebirgsseen in Riesengebirge. Biol. Centralbl. v. p. 3.

166. ZITTEL, K. A. Handbuch der Palæontologie. Bd. ii. pp. 525–721. München und Leipzig: 1885, 8vo.

167. ——. Bemerk. über einige fossile Lepaditen. SB. Ges. Münch. xiv. pp. 577–589. [*Vide Cirrhipedia*, Palæontology.]

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Brachyura (*Thelphusa*), 99.
Cirrhipedia (*Balanus*), 106.
(*Laura*), 85.
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Macrura (*Astacus*), 135.
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III.—SYSTEMATIC PART.

DECAPODA.

BRACHYURA.

CANCRIDÆ.

Uca cunninghami (Sp. Bate) referred to *Trichodactylus*, and to be known as *T. cunninghami*, = *T. punctatus* (Sp. Bate); Göldi, (51) p. 62.

Sylviocarcinus petropolitanus, sp. n., *id.*, *Leptopodia lineata*, sp. n., *id.*, *Stenorhynchus longirostris*, sp. n., *id.*, named but not described, from Brazil, p. 63.

DROMIIDÆ.

Dromia and its commensals; Haacke (57).

LEUCOSIIDÆ.

Ebalia cranchii (Leach) at Penzance; Zool. (3) ix. p. 115.

LITHODIDÆ.

Lithodes antarcticus, shell of, used as barometer; Miklouho-Maclay (102).

MAIIDÆ.

Scyramathia carpenteri = *Amathia carpenteri* (Norman), off Norway; may be identical with *Scyra umbonata* (Simpson). *Amathia agassizi* (S. Smith) should be referred to genus *Scyramathia* (M.-Edw.). Sars, (133) p. 6.

Pisa tetraodon at Penzance; Zool. (3) ix. p. 390.

Micippa, *Paramicippa*, species of; Miers (101).

PARTHENOPIDÆ.

Lambrus? angulifrons, mimicry by; De Varigny (152).

Thelphusidæ.

Thelphusa depressa (Krauss), var. n. *johnstoni*, taken by Johnston from Kilima-njaro ; Miers, (100) p. 237. *T. granosa*, sp. n., description and figures ; Koebel (82). *T. fluviatilis*, development of ; Mercanti (99).

Palæontology.

Lobocarcinus paulino-würtemburgicus (Meyer), from Tertiaries of Egypt ; *L. cairensis* (Fraas) : Nötling, (111) p. 499.

Palæocarpilius macrocheilus (Desm.), *id.* p. 489.

Hepatiscus schweinfurthi, sp. n., *id.* p. 488.

Ranina marestiana (König), *id.* p. 488.

Callianassa fraasi, sp. n., *C. mokattamensis*, sp. n., *C. longa*, sp. n., *C. transversoplicata*, sp. n., *C. nilotica* (Fraas.), *id.* pp. 491–497.

Pagurus (*Clibanaria* ?) *dubius*, sp. n., *id.* p. 497.

MACRURA.

Astacidæ.

Homarus vulgaris (Edw.), Lovett, (88) p. 100 ; *H. americanus*, Smith (141).

Nephrops norvegicus (Leach), Lovett, (88) p. 253.

Nephropsis cornubiensis (Sp. Bate), *id.* p. 255. On the genus, see also Wood-Mason (162).

Eunephrops bairdii, g. & sp. nn., Smith (142).

Astacus fluviatilis, figures of dissections of, Howes (70) ; distomatosis in, Hilgendorf (66) ; notes on, Lovett, (88) p. 17, Malé (93) ; uric acid in green gland of, Griffiths (54) ; diseases of, (150), Koch (81), Raveret-Wattel (128).

Astacus leptodactylus, development of ; Schimkewitsch (135).

Caridiæ.

Bythocaris leucopis, sp. n., Sars, (133) p. 27, 1110 fath., Arctic.

B. payeri (Heller), 350–1110 fath., Arctic, *id.* p. 33.

Atyephira compressa, development of ; Ishikawa (73).

Solenocera distincta (Miers) = *Penæus distinctus* (de Haan), description and figures of ; Kœbel, (82) p. 314.

Euatya sculptilis, sp. n., *id.* p. 317.

Pandalus dapifer, sp. n., Murdoch, (104) p. 519.

Crangonidæ.

Crangon vulgaris (Fabr.), Lovett, (88) p. 467.

Sclerocrangon, g. n., Sars (133) p. 14 ; separated from gen. *Crangon* by rough integument, arcuate carapace, slenderness of second pair of legs, etc. *Crangon cataphractus* (Olivi) should be referred to this genus, as also *Cheraphilus agassizi* (S. Smith).

[illegible]*agon salebrosus* = *Crangon salebrosus* (Owen) = *Cheraphilus* [illegible] Sars), Sars (133), from Spitzbergen, Norway, Jan Mayen.

Ephyridæ (Roux.) = Miersidæ (Kingsley).

Hymenodora glacialis = *Pasiphae glacialis* (Buchholz), Sars, (133) p. 37, 452–1862 fath. *Meningodora mollis* (S. Smith) probably belongs to gen. *Hymenodora*.

Galatheidæ.

Galathea pusilla, sp. n., N. S. Wales, *G. inconspicua*, sp. n., Banda Is., Henderson, (64) pp. 407 & 408.

Munida normani, sp. n., p. 408, *M. spinosa*, sp. n., p. 408, *M. granulata*, sp. n., p. 409, *M. squamosa*, sp. n., p. 409, *M. scabra*, sp. n., p. 409, *M. proxima*, sp. n., p. 410, *M. vitiensis*, sp. n., p. 410, *M. militaris*, sp. n., p. 410, *M. inornata*, sp. n., p. 411, *M. sancti-pauli*, sp. n., p. 411, *M. haswelli*, sp. n., p. 411, *M. gracilis*, sp. n., p. 412, *M. curvirostris*, sp. n., 412, *M. spinifrons*, sp. n., p. 412, *M. tuberculata*, sp. n., p. 413, *M. spinicordata*, sp. n., p. 413, *id.*

Eumunida smithii, sp. n., *id.* p. 413.

Munidopsis brevimana, sp. n., *M. subsquamosa*, sp. n., *M. milleri*, sp. n., *M. trifida*, sp. n., *M. pilosa*, sp. n., *id.* pp. 414 & 415.

Elasmonotus latifrons, sp. n., *E. marginatus*, sp. n., *E. miersii*, sp. n., *E. asper*, sp. n., *id.* p. 416.

Galathopsis, subg. n., between *Munidopsis* and *Elasmonotus*. *G. lævigata*, sp. n., *G. debilis*, sp. n., *id.* p. 417.

Galacantha bellis, sp. n., *id.* p. 418.

Ptychogaster lævis, sp. n., *P. milne-edwardsi*, sp. n., *id. ibid.*

Diptychus insignis, sp. n., p. 419, *D. spinimarginatus*, sp. n., p. 419, *D. parvulus*, sp. n., *D. politus*, sp. n., *D. australis*, sp. n., *D. gracilimanus*, sp. n., p. 420, *D. tridentatus*, sp. n., *id.* p. 421.

Paguridæ.

Eupagurus meticulosus (Roux.), = *E. tricarinatus* (Norman); Sars, (133) p. 11, off Norway, 98 fath., in old shell of *Sipho islandicus*.

Penæidæ.

Parapenæus, g. n., formed from *Penæus*, to include *P. longirostris* (Luc.), p. 171, *politus* (Smith), p. 172, *megalops*, sp. n., p. 172, *constrictus* (Stimpson) and var. *similis*, p. 174, *barbatus* (de Haan), p. 176, *goodei*, sp. n., p. 177, Smith (143).

Hymenopenæus robustus, sp. n., *id.* p. 180, *modestus*, sp. n., p. 183.

Solenocera siphonocera (Miers); *id.* p. 186.

Aristeus? foliaceus = *Penæus? foliaceus* (Heller); *id.* p. 188.

Xiphopenæus kroyeri (Heller); *id. ibid.*

Thalassinidæ.

Gebia deltura (Leach); Lovett, (88) p. 15.
Axius stirhynchus (Leach); *id.* p. 16.
Calocaris macandreæ (Bell); *id. ibid.*

Palæontology.

Anthracaridæ, fam. n., to include *Anthrapalæmon* (Meek & Worthen), Carboniferous; Packard (115)

Hoploparia canadensis, ? sp. n., from Up. Cretaceous of N. W. Terr.; Whiteaves (157). *H. muncki*, sp. n., Pelseneer (119).

LEPTOSTRACA.

Nebalia. Systematic position of; Claus (28). [See also Woodward (163), Dollo (35).]

SCHIZOPODA.

Eucopiidæ.

Eucopia australis (Dana). This, the sole species, ranked by Dana & Sp. Bate among *Penæidæ*, regarded by Sühm and Sars as requiring a separate family of *Schizopoda*. Atlantic, Antarctic, Pacific Oceans, from 350–2500 fath. Sars, (132) p. 53.

Euphausiidæ.

Euphausia pellucida (Dana), Sars, (132) p. 75, = *E. mülleri* (Claus) = *Thysanopoda bidentata* (Sars), of almost universal distribution. *E. similis* (Sars, 1883), *id.* p. 79. *E. splendens* (Dana), *id.* p. 80. *E. murrayi* (Sars, 1883), *id.* p. 82. *E. superba* (Dana), *id.* p. 84. *E. antarctica* (Sars, 1883), *id.* p. 86. *E. mucronata* (Sars, 1883), *id.* p. 87. *E. gracilis* (Dana), *id.* p. 89. *E. gibba* (Sars, 1883), *id.* p. 91. *E. spinifera* (Sars, 1883), *id.* p. 93. *E. latifrons* (Sars, 1883), *id.* p. 95.

Thysanopoda tricuspidata (M.-Edw.), *id.* p. 98. *T. obtusifrons* (Sars, 1883), *id.* p. 102. *T. cristata* (Sars, 1883), *id.* p. 104. *T. microphthalma*, sp. n., *id.* p. 106.

Bentheuphausia, g. n., Sars, (132) p. 108, characterized by complete development of all the legs. *B. amblyops*, sp. n., *id.* p. 109, = *Thysanopoda amblyops* (Sars, 1883), 1000–1800 fath.

Nyctiphanes australis (Sars, 1883), *id.* p. 115. *Nyctiphanes* (= *Thysanopoda*, M. Sars) *norvegica*, = ? *T. couchii* (Bell), should be included in this genus.

Thysanoëssa gregaria (Sars, 1883), *id.* p. 120. *T. macrura* (Sars, 1883), *id.* p. 125.

megalops (Sars, 1883), *id.* p. 127. *N. microps* (Sars, 1883), [illegible]. *N. tenella* (Sars, 1883), *id.* p. 133. *N. rostrata* (Sars, 1883), *id.* p. 135.

Stylocheiron carinatum (Sars, 1883), *id.* p. 137. *S. sühmii* (Sars, 1883), *id.* p. 142. *S. longicorne* (Sars, 1883), *id.* p. 144. *S. elongatum* (Sars, 1883), *id.* p. 146. *S. abbreviatum* (Sars, 1883), *id.* p. 147.

Lophogastridæ.

Lophogaster typicus (M. Sars), Sars, (132) p. 14, from the Cape of Good Hope, hitherto obtained only from Norway and the Shetlands.

Ceratolepis hamata (Sars, 1883), *id.* p. 17.

Gnathophausia ingens (Dohrn), *id.* p. 30, Arafura Sea. *G. gigas* (Willemoes-Sühm), *id.* p. 33. *G. calcarata* (Sars, 1883), *id.* p. 35. *G. willemoesii* (Sars, 1883), *id.* p. 38. *G. affinis* (Sars, 1883), *id.* p. 41. *G. elegans* (Sars, 1883), *id.* p. 42. *G. zoea* (W.-Sühm.), *id.* p. 44, from N. Atlantic to Pacific Ocean. *G. longispina* (Sars, 1883), *id.* p. 46. *G. gracilis* (W.-Sühm), *id.* p. 48.

Chalaraspis, g. n. (W.-Sühm, *ex parte*), *id.* p. 50, characterized by an enormous membranous carapace, covering the anterior part of the tail. *C. alata* (W.-Sühm), specimen lost, but figured on p. 50, Sars (132).

Mysidæ.

Erythrops glacialis, sp. n., Sars (133) p. 45, Arctic, 498 fath.

Parerythrops spectabilis, sp. n., *id.* p. 47, Arctic, 417 fath.

Pseudomysis, g. n., *id.* p. 50, approximate to his gen. *Mysideis*, but distinct from it by the eyes, and the auditory apparatus in the inner caudal plate, being rudimentary; telson very short, lamelliform, incised posteriorly. *P. abyssi*, sp. n., 1110 fath., Arctic.

Boreomysis nobilis, sp. n., *id.* p. 54. *B. scyphops*, sp. n., *id.* p. 55, 1110 fath., Arctic. [Also Sars, (132) p. 178, Subantarctic, 1600–1950 fath.]

Boreomysis obtusata (Sars, 1883), Sars, (132) p. 182. *B. microps* (Sars, 1883), *id.* p. 184.

Petalophthalmus armiger (W.-Sühm), *id.* p. 174, Trop. Atl., 2500 fath.

Amblyops crozettii (W.-Sühm), *id.* p. 186.

Pseudomma sarsii (W.-Sühm), *id.* p. 189. *P. australe*, *id.* p. 191, = *Amblyops australe* (Sars, 1883).

Anchialus typicus (Kröyer), *id.* p. 193, = *A. truncatus* (Sars, 1883), = *Mysis moebii* (Dohrn). *A. angustus* (Sars, 1883), *id.* p. 197. *A. pusillus* (Sars) *id.* p. 200, = *Promysis pusilla* (Sars, 1883).

Mysidopsis incisa (Sars, 1883), *id.* p. 202.

Siriella thompsoni (M.-Edwards), *id.* p. 205, = *Cynthia thompsoni* (M.-Edwards) = *Siriella vitrea* (Dana) = ? *S. brevipes* (Dana) = *S. edwardsii* (Claus). *S. gracilis* (Dana), *id.* p. 209, Pacific Ocean and Indian Archip., surface form.

Euchætomera typica (Sars, 1883), *id.* p. 211. *E. tenuis* (S.. from p. 214.

Heteromysis (Smith). This genus = *Chiromysis* (Sars), and now includes *H. formosa* (Smith), *microps* (Sars), *norvegica* (Sars), and *H. bermudensis*, sp. n.; Sars, (132) p. 216.

Mysis vulgaris (J. V. Thompson). *M. kervillei*, sp. n., with description by G. O. Sars, intermediate between *M. ornata* and *M. spiritus*; de Kerville, (79) p. 90.

Macropsis slabberi and var. *minor* (v. Beneden); de Kerville, (79) p. 91.

Gastrosaccus spinifer (Goës), de Kerville, (79) p. 90.

Mysis rayii, sp. n., Murdoch, (104) p. 519.

Palæontology.

Palæocaris typus (Meek & Worthen), Carboniferous; Packard (116).

Gampsonychidæ, fam. n., *id.*

STOMATOPODA.

Squilla, general observations on; Rathbun, (127) p. 823: burrows and stridulation of; Brooks (14).

Lysiosquilla, burrows of; Brooks (14).

AMPHIPODA.

LÆMODIPODA.

Caprellidæ.

Caprella microtuberculata, sp. n., Sars, (133) p. 222. *C. spinosissima*, (Norman), *id.* p. 227.

Ægina spinifera, *id.* p. 228, = *C. spinifera* (Bell) = *Æ. spinosissima* (Stimpson), Iceland and Spitzbergen.

Proto novæ-hollandiæ (Hasw.) described and figured by Haswell, (62) p. 111.

HYPERINA.

Hyperiidæ.

Hyperiopsis, g. n., Sars, (133) p. 231. Body of the usual form in *Hyperidæ*; head with upper part prominently arcuate; eyes incompletely developed; first antennæ larger than second, with accessory flagellum; mandibles palpigerous; first two pairs of legs feeble, not subchelate; last three pairs of thoracic legs very slender, long; pleopoda powerful, last pair biramous; telson rudimentary. *H. coringii*, sp. n., off Norway, in 600 fath.

MIMONECTIDÆ, fam. n.

Instituted by Bovallius (12) for reception of single gen. *Mimonectes*, including *M. lovéni*, *steenstrupii*, and *sphæricus*, spp. nn.

GAMMARINA.

COROPHIIDÆ.

Unciola petalocera, sp. n., Sars, (133) p. 212.

Epimeria loricata, sp. n., *id.* p. 166.

Paramphithoe euacantha, sp. n., *id.* p. 168.

Podocerus assimilis, sp. n., *id.* p. 205. *P. tenuicornis*, sp. n., *id.* p. 209, from 1110 fath. *P. brevicornis*, sp. n., *id.* p. 207.

Erichthonius megalops, sp. n., *id.* p. 211.

Haplocheira typica (Hasw.), formerly placed with *Gammaridæ*, described and figured by Haswell, (62) p. 106.

Harmonia crassipes (Hasw.), *id.* p. 106.

Cyrtophium parasiticum (Hasw.) and *C. minutum* (Hasw.), *id.* p. 108.

Dexiocerella dentata = *Cyrtophium dentatum* (Hasw.) ; *D. lobata*, sp. n., *D. lævis*, sp. n. ; *id.* pp. 109–111.

Læmatophilus hystrix = *Cyrtophium hystrix* (Hasw.); *id.* p. 110.

Cyrtophium calamicola, sp. n., from Bay of Bengal, Giles, (49) p. 54.

DULICHIIDÆ.

Dulichia tuberculata (Boeck), Sars, (133) p. 215, from Spitzbergen, in 10–20 fath. *D. hirticornis*, sp. n., *id.* p. 218. *D. macera*, sp. n., *id.* p. 220. *D. arctica*, sp. n., Murdoch, (104) p. 520.

GAMMARIDÆ.

The genera of Boeck, *Onisimus*, *Orchomene*, and *Tryphosa*, should, according to Sars (133), be ranged under *Anonyx*.

Mæra tenera, sp. n., *id.* p. 177. (*M. tenella*, Sars, preoccupied).

Melita pallida, sp. n., *id.* p. 179 ; occurring in wood, inhabiting holes probably made by Teredo, 1333 fath.

Amathillopsis spinigera (Heller), *id.* p. 181, Arctic, 350–748 fath.

Socarnes bidenticulatus, *id.* p. 139, = *Lysianassa bidenticulatus* (Sp. Bate) = *S. ovalis* (Hoek) ; specifically distinct from *Anonyx vahlii* (Kröyer), *pace* Goës, 40–60 fath.

Hippomedon holbölli (Kröyer) var., *id.* p. 142, = *H. abyssi* (Sars), 350–1215 fath.

Anonyx calcaratus, sp. n., *id.* p. 142, = *Hippomedon calculatus* (Sars), 658–1200 fath. *A. typhlops*, sp. n., *id.* p. 145, 1710–1760 fath.

Onisimus turgidus, sp. n., *id.* p. 147, = *Anonyx turg.* (Sars), pa... from large Actinian, 223 fath. *O. leucopis*, sp. n., *id.* = *Anonyx leucopsis* (Sars).

Tryphosa pusilla, sp. n., *id.* p. 151, = *Anonyx pusilla* (Sars).

Phoxus oculatus, sp. n., *id.* p. 154.

Harpinia abyssi, sp. n., *id.* p. 157, 350–2215 fath. *H. carinata*, sp. n., *id.* p. 159. *H. mucronata*, sp. n., *id.* p. 161. *H. serrata*, sp. n., *id.* p. 162.

Urothoë abbreviata, sp. n., *id.* p. 164.

Halirages quadridentatus, sp. n., *id.* p. 172.

Cleippides quadricuspis (Heller), *id.* p. 174, 350–1004 fath.

Amphithopsis pulchella, sp. n., *id.* p. 175.

Ampelisca odontoplax, sp. n., *id.* p. 196. *A. minuticornis*, sp. n., *id.* p. 198.

Byblis abyssi, sp. n., *id.* p. 201.

Lilljeborgia aquicornis, sp. n., *id.* p. 192.

Tritopsis appendiculata, sp. n., *id.* p. 194.

Œdiceros macrocheir, sp. n., *id.* p. 170.

Metopa spectabilis, sp. n., *id.* p. 185. *M. aquicornis*, sp. n., *id.* p. 188.

Danaia abyssicola, sp. n., *id.* p. 190. This genus of Sp. Bate identical with *Cressa* of Boeck.

Antonoë megacheir, sp. n., *id.* p. 203.

Brüzelia serrata, sp. n., *id.* p. 182.

Acidostoma laticorne, sp. n., *id.* p. 152, Arctic.

Cyproidea damnoniensis, sp. n., Stebbing, (146) p. 59, from Devon.

Aora and *Microdeutopus* identical; Chilton (26).

Stegocephalus latus (Hasw.) described and figured by Haswell, (62) p. 97.

Ampelisca australis (Hasw.), *id.* p. 97.

Lysianassa nitens (Hasw.) better placed under *Anonyx*; *L. australiensis*, *L. affinis*, described and figured; *id.* p. 98.

Eusirus dubius (Hasw.) var.; *E. affinis*, sp. n.: *id.* p. 100.

Atylus homocheir, sp. n., *id.* p. 101.

Dexamine miersii, sp. n., *id.* p. 102.

Megamœra suensis (Hasw.), *id.* p. 103; *M. mastersii* = *M. thomsoni* (Miers): *id.* p. 105.

Mœra spinosa, *M. rubro-maculata*, *M. ramsayi*, form a varying series, together with *M. festiva* (Chilt.); *id.* p. 105.

Xenocheira fasciata (Hasw.), *id. ibid.*

Melita megacheles, sp. n., Bay of Bengal, Giles (50).

Niphargus puteanus (Koch), observations on; van Beneden (6); in Lake of Geneva, var. *forelii* (Humbert); Forel, (45) pp. 112–170.

Acanthozone polyacantha, sp. n., Murdoch, (104) p. 520.

Melita formosa, *M. leonis*, spp. nn., *id.* p. 521.

Audania pectinata (Sars), parasitic in Tunicates; Aurivillius, (2) p. 282.

Aristias tumidus (Kr.), *id. ibid.*

Gammarus tunetanus, sp. n., Simon, (140) p. 6.

ORCHESTIIDÆ.

Talitrus sylvaticus (Hasw.) described and figured by Haswell, (62) p. 95.

Allorchestes longicornis, A. crassicornis, A. rupicola, A. niger, A. gaimardii, A. australis, id. pp. 95 & 96.

Neobule algicola (Hasw.), *id.* p. 96.

ISOPODA.

Sars (133) divides the forms investigated by him into 5 tribes :— *Chelifera*; *Flabellifera*, in which the posterior pair of abdominal limbs and last segment form a more or less distinct caudal fan, including the famm. *Anthuridæ*, *Anceidæ*, *Cymothoidæ* (including *Ægidæ* and *Cirolanidæ*), *Serolidæ*, and *Sphæromidæ* (including *Limnoriidæ*); *Valvifera*, distinguished by the last pair of abdominal limbs or caudal appendages arching over the other pairs, and modified as valvular flaps, so as to leave the rest in a spacious cavity covered above by the scutiform terminal segment, containing *Arcturidæ* and *Idoteidæ*; *Asellota*, in which no such modification occurs, and the abdominal limbs are never natatory, including the famm. *Asellidæ* and *Munnopsidæ*; *Epicarides* (M.-Edw.), hitherto classed with *Cymothoidæ*, regarded by F. Müller as most approaching *Oniscoidea*, consisting of the genn. *Bopyrus*, *Dajus*, *Entoniscus*, *Cryptoniscus*, etc.

ANCEIDÆ.

s stygius (Sars.), Sars, (133) p. 85, 658–1215 fath.; *A. hirsutus*, s *id.* p. 92. *A. robustus*, sp. n., *id.* p. 94.

A..ceus (*Praniza*) *torpedinis*, sp. n., Walter (156), in spiracles of a Torpedo from Ceylon.

APSEUDIDÆ.

Sphyrapus (Norman, MS.), distinct from *Apseudes* by absence of squamiform appendage on second antennæ, possession of rudimentary exopodite on chelipeds only; now includes *S. tudes*, *S. malleolus* (Norman), *S. anomalus* = *Apseudes anom.* (Sars.), and *S. serratus*, sp. n., Sars, (133) p. 66, 1333 fath.

ARCTURIDÆ.

Arcturus baffini, Sars, (133) p. 97, = *Idotea baffini* (Sabine) = *A. tuberculatus* (Latreille). *A. tuberosus*, sp. n., *id.* p. 102 = *A. baffini* var. *feildeni* (Miers), off Norway, 412 fath. *A. hystrix*, sp. n., *id.* p. 104.

Astacilla (Fleming) = *Leachia* (Johnston), *A. granulata*, sp. n.; Sars, (133) p. 107, Arctic.

Asellidæ.

Acanthoniscus typhlops, sp. n., Sars, (133) p. 119, sole sp. of gen. founded by him in 1878, resembles *Janira* (Leach), but differs from it in absence of eyes, and in all the legs being true pereiopoda.

Nannoniscus bicuspis, sp, n., *id.* p. 122.

Ischnosoma quadrispinosum, sp. n., *id.* p. 126.

Jæropsis brevicornis, g. & sp. nn., Kœhler (83), pp. 1–7.

Asellus forelii (Blanc), in Lake of Geneva, Forel, (45) pp. 113, 170.

Asellus, nervous system of; Packard (118).

Cymothoidæ.

Anilocra edwardsi, sp. n., St. Loup (147), p. 175.

Cymothoe æstre (Schiödte) (?), *id.* p. 175.

Livoneca redmanni (Leach), Schiödte, (136) p. 353; *L. mediterranea* (Hell.), p. 358; *L. caudata*, sp. n., p. 360; *L. indica* (M.-Edw.), p. 362; *L. boscii* (Bleeker), p. 365; *L. raynaudii* (M.-Edw.), p. 367; *L. californica*, sp. n., p. 372; *L. methepia*, sp. n., p. 374; *L. samoensis*, sp. n., p. 376; *L. sinuata* (Kœlbel), p. 378.

Irona, g. n., *id.* p. 381; *I. renardi* (= *L. renardi*, Bleeker), p. 383; *I. valia*, sp. n., p. 386; *I. melanosticta*, sp. n., p. 388; *I. nana*, sp. n., p. 390.

Cterissa, g. n., *id.* p. 396; *C. pterygota* (= *L. pterygota* of Kœlbel), p. 397.

Artystone trysibia (Schiödte), *id.* p. 402.

Urozeuctes oweni (M.-Edw.), *id.* p. 405; *U. monacanthi*, sp. n., p. 407; *U. caudatus*, sp. n., p. 411. [*Vide* also Lucas (89).]

Rocinela maculata (Schiödte & Meinert), *id.* p. 413.

Renocilla ovata (Miers), *id.* p. 416; *R. indica*, sp. n., p. 417.

Braga patagonica, sp. n., *id.* p. 419.

Rocinela lilljeborgi, sp. n., Bovallius (13).

Dajidæ.

Heterophryxus appendiculatus, g. & sp. nn., Sars, (132) p. 220, attached to dorsum of *Euphausia pellucida*.

Notophryxus, g. n., parasitic on Schizopods. *N. clypeatus*, sp. n. (= *Leptophryxus clyp.*, Sars, *ante*); Sars, (133) p. 136. *N. lateralis*, sp. n., Sars, (132) p. 220, on *Nematoscelis megalops*. *N. globularis*, sp. n., *id.* p. 220, on *Thysanoëssa gregaria*.

Dajus siriellæ, sp. n., *id.* p. 221, on *Siriella thompsoni*.

Idoteidæ.

Glyptonotus megalurus, sp. n., Sars, (133) p. 112, = *Chiridotea meg.* (Sars), 1081–1710 fath.

...ea bicuspida, Sars, (133) p. 116, = *Idotea bicusp.* (Owen), = *S. incisa* (Sars), 40–60 fath., apparently circumpolar.

Idotea festiva, sp. n., Chilton (25).

Munnopsidæ.

Eurycope gigantea, sp. n., Sars, (133) p. 130. *E. novæ-zealandiæ*, *E. sarsii*, *E. intermedia*, *E. atlantica*, *E. fragilis*, *E. pellucida*, *E. abyssicola*, *E. spinosa*, spp. nn., Beddard, (4) pp. 917 & 918.

Munnopsis gracilis, *M. latifrons*, *M. australis*, spp. nn., Beddard, (4) p. 916.

Acanthocope, g. n.; *A. spinicaudata*, *A. acutispina*, spp. nn., *id.* p. 922.

Oniscidæ.

Armadillo mayeti, sp. n., Simon, (140) p. 7.

Armadilloniscus letourneuxi, sp. n., *id.* p. 8.

Porcellio variabilis (Luc.), *id.*; *P. budde-lundi*, p. 10, *P. letourneuxi*, spp. nn., *id.* p. 12.

Sphæromidæ.

Leptosphæroma gottschei, g. & sp. nn., close to genus *Placarthrium* (Chilton), S. Japan, Hilgendorf, (67) p. 185.

Tanaidæ.

Cryptocope, g. n., Sars (133), differs from the other genn. by the pleopoda in the female being rudimentary, but biramous. *C. voringii*, sp. n., p. 74.

Leptognathia longiremis, Sars, (133) p. 79, = *Tanais long.* (Lilljeborg), = *T. islandicus* (Sars), 16–20 fath., Reikjavik Harbour.

Typhlotanais cornutus, sp. n., Sars, (133) p. 83.

PHYLLOPODA.

Estheria mexicana, larva of; Chambers (23).

Polyartemia hazeni, sp. n., Murdoch, (104) p. 522.

Apus numidicus (Grube), Simon, (140) p. 17.

Estheria cycladoides (Joly), *id.* p. 18; *E. angulata*, sp. n., p. 19; *E. mayeti*, sp. n., p. 20.

Artemia salina, observations on; v. Friedenfels (47).

Apus, nervous system of; Pelseneer (120).

Palæontology.

Ceratiocaris murchisoni (Ag.) and var. *leptodactylus* (M'Coy), p. 387; *C. ludensis* (Woodw.), p. 392; *C. papilio* (Salter), p. 392; *C. stygia*

(Salter), p. 394; *C. inornata* (M'Coy), p. 460; *C. oretonensis* (M'Coy), p. 461; *C. truncata* (Woodw.), p. 461; *C. solenoides* (M'Coy), p. 461; *C. gobiiformis*, sp. n., p. 462; *C. salteriana*, sp. n., p. 462; *C. cassia* (Salter), p. 463; *C. robusta* (Salter), p. 464; *C. elliptica* (M'Coy); *C.* (= *Physocaris*) *vesica* (Salter), p. 466; and some doubtful specimens: Jones (78).

OSTRACODA.

Palæontology.

Kirkbya, the Carboniferous species of; Jones (76).

Cypris purbeckensis (Forbes), Maillard (92). *C. alburyana*, sp. n., in Travertine of Tasmania; Johnston (74).

Cypridea ventrosa, sp. n., *C. dunkeri*, sp. n., Purbeck, Jones (75).

Cyprione bristowii, sp. n., *id.*

Metacypris forbesii, sp. n., *id.*

Candona ausata, sp. n., *id.*

Cythere transiens, sp. n., *id.*

COPEPODA.

Calanidæ.

Euchæta norvegica (Boeck), Sars, (133) p. 234, = *E. carinata*, Möbius, off Norway, in deeper strata only.

Diaptomus, antennæ of, Imhof (71).

Heterocope, antennæ of, *id.*

Diaptomus bacillifer, sp. n., Kœbel (82).

Dias intermedius, sp. n., described and figured; Poppe, (124) p. 173.

Temora longicornis (O. F. Müller), *id.* p. 176.

Temorella clausii (Hoek), *id.* p. 180; *T. affinis* (Poppe) = *Temora velox* ♂ (Lilljeb.), *id.* p. 184.

Centropages hamatus (Lilljeb.), *id.* p. 187.

Peltidium conophorum, sp. n., *id.* p. 191.

Corycæidæ.

Myicola metisensis, sp. n., Ramsay Wright, (164) p. 118. ♀ parasitic in gill-tubes of *Mya arenaria*, ♂ free in mantle cavity; intermediate between *Lichomolgus* and *Ergasilus*.

Cyclopidæ.

Cyclops brevicornis, morphology of; Hartog (61). *C. elongatus*, etc., development of; Urbanowicz (151).

ENTEROPSIDÆ, fam. n.

Mouth-parts rank this new family near the *Ergasilidæ*; Aurivillius, (2) p. 282. *Enteropsis*, g. n., *Haligryps*, g. n., in branchial sac of *Molgula ampulloides* [no species indicated].

HARPACTICIDÆ.

Idya furcata (Baird) parasitic in Tunicates; Aurivillius, (2) p. 282.
Ectinosoma curticorne (Boeck) described and figured; Poppe, (124) p. 194.
Delavalia palustris (Brady), *id.* p. 198.
Huntemannia jadensis (Poppe), *id.* p. 201.

NOTODELPHYIDÆ.

Notodelphys agilis (Thor.), Aurivillius, (2) p. 282.
Buprorus lovéni (Thor.), *id.* p. 282.
Doropygus demissus, sp. n., parasitic in *Cynthia echinata*; *D. arcticus*, sp. n., in *Chelyosoma maclayanum*, *id.* p. 282.

SCHIZOPROCTIDÆ, fam. n.

Ranked near the *Notodelphyidæ* by the mouth-parts; Aurivillius, (2) p. 282.

GENERA INCERTÆ SEDIS.

Leanicola rotundata, g. & sp. nn., on *Leanira areolata*; McIntosh, (103) p. 153.
Trophoniphila bradii, sp. n., on *Trophonia wyvillei*, *id.* p. 368.
Praxillinicola kröyeri, g. & sp. nn., on *Praxilla abyssorum*, *id.* p. 409.
Œstrella levinseni, g. & sp. nn., on *Ehlersiella atlantica*, *id.* p. 477.

CUMACEA.

DIASTYLIDÆ.

Diastylis nodosa, sp. n., Sars, (133) p. 61, 125 fath., Arctic.
Cuma rathkii, development of; Blanc (8).

CIRRHIPEDIA.

BALANIDÆ.

Balanus, development of; Nassonow (106).
Balanus crenatus, Brug., var., Sars, (133) p. 252. Abnormal development of wall of shell, perhaps due to growth in a confined space.

Lepadidæ.

Scalpellum stromii (M. Sars), Sars, (133) p. 241, not uncommon off Norway. *S. angustum*, sp. n., *id.* p. 243. *S. striolatum*, sp. n., *id.* p. 245. *S. cornutum*, sp. n., *id.* p. 248. *S. hamatum* (Sars), *id.* p. 249. *Vide* also Hoek (68), with reference to complemental males, &c.

Genus incertæ sedis.

Laura gerardiæ, g. & sp. nn., Lacaze-Duthiers (85).

Palæontology.

Loriculina noetlingi, sp. n., Dames, (32) p. 151.
Loricula lævissima, sp. n., Zittel, (167) p. 589.
Archæolepas, g. n., *id.* to include *A.* (= *Pollicipes*) *redtenbacheri* (Opp.), p. 582; *A.* (= *P.*) *royeri* (Loc.), p. 584; *A.* (= *P.*) *quenstedti* (*vide* Ammon), p. 585.

RHIZOCEPHALA.

Peltogastridæ.

Sylon hymenodoræ (Sars), Sars, (133) p. 253, attached to first abdominal segment of *Hymenodora glacialis*, 1861 fath.
Peltogaster, nervous system of; Delage (34).

SYNCARIDA (ord. n.).

Acanthotelson; Packard (114).

XIPHOSURA.

Limulus. Muscular system of, and comparison with *Scorpio*; Lankester (87). Chitin in the cartilages of; Halliburton (60). Coxal gland of; Gullard (56). Embryology of; Kingsley (80), Packard (117), Brooks (15), Osborne (112). Chemical composition of blood of; Howell (69), Gotch (52). Various observations on; Rathbun, (127) p. 829. Gill-books of; Lankester (86).

Palæontology.

Belinurus lacoei, sp. n., Carboniferous, Packard, (113) p. 292.
Euproops longispina, sp. n., *id.* p. 292.
Cyclus americanus, sp. n., *Cyclidæ*, fam. n.; *id.* p. 293.
Dipeltis diplodiscus, g. & sp. nn., *id.* p. 293.

...ides acadicus, *P. lamellatus*, *P. micmac*, Matthew (97).

Ctenocephalus matthewi, *id.* p. 103.

Conocoryphe baileyi (Hartt.), *C. elegans* (Hartt.), *C. walcotti*, sp. n., *id.* p. 111.

Mesonacis, g. n., Walcott (155).

Prestwichia eriensis, sp. n., Devonian, with relations to *Limulus* and *Trilobites*; Williams (159).

Acidaspis emarginata, sp. n., p. 2, *kuckersiana*, sp. n., p. 4, Schmidt (137).

Lichas, description and figures of the East Baltic species of, including the following new ones: *L. wesenbergensis*, p. 44, *L. holmi*, p. 54, *L. kuckersiana*, p. 67, *L. longispina*, p. 75, *L. plantini*, *id.*, *L. furcifer*, p. 80, *L. pahleni*, p. 97, *L. st. mathiæ*, p. 115, *L. docens*, p. 121, *L. hamata*, p. 124: Schmidt (137).

Homalonotus major, sp. n., Whitfield (158).

Prestwichia rotundata (Woodw.) occurring near Osnabrück; Bölsche (10).

ARACHNIDA.

(Including the new genera and species of 1883 and 1884.)

BY

DR. P. BERTKAU.

BERTKAU, P. Ueber die Coxaldrüsen der Arachniden. SB. Niederrh. Ges. 1885, pp. 13–16.

The author found the glands opening to the exterior on the coxa of the first and of the third pair of legs in an adult *Atypus*.

CLAUS, C. Ueber das von Willib. Winkler aufgefundene Herz der Gamasiden. Anz. Ak. Wien, 1885, pp. 250–253 ; abstr., J. R. Micr. Soc. (2) vi. pp. 240 & 241.

CARLINI, A. DE. Artropodi dell' isola di S. Pietro. Bull. Ent. Ital. xvii. pp. 192–196.

Arachnida, p. 196 ; 1 *Scorpio*, 19 *Araneæ*, 1 *Opilio*.

CRAGIN, F. W. First Contribution to a Knowledge of the *Arachnida* of Kansas. Bull. Washburn Coll. i. pp. 145 & 146.

GRASSI, B. Intorno ad un nuovo Aracnide Artrogastro (*Koenenia mirabilis*), che crediamo rappresentante d'un nuovo ordine (*Microtelifonidi*). Nat. Sicil. iv. pp. 127 *et seq.*, 152 *et seq.*

The author found in Sicily a little arthrogastric Arachnid, forming a connecting link between the *Solifugæ*, *Thelyphonidæ*, *Phrynidæ*, and *Tartaridæ*, and allied to the genus *Nyctalops* (Cambr.). He proposes the order *Microtelifonidi* for it.

GULLAND, E. L. Evidence in Favour of the View that the Coxal Glands of *Limulus* and of other Arachnids is a modified Nephridium. Q. J. Micr. Sci. xxv. pp. 511–520, 1 pl.

The young *Limulus* has the gland in the form of a tube opening to the exterior on the fifth appendage by one extremity, and to the primitive cœlom by the other.

HALLIBURTON, W. D. On the Occurrence of Chitin as a Constituent of the Cartilages of *Limulus* and *Sepia*. Q. J. Micr. Sci. xxv. pp. 173–181.

Hansen, H. J. Arthrogastra Danica: en monographisk fre... af de i Danmark levende Meiere og Mosskorpioner med bidrag til sidstaevnte underorders systematik. Nat. Tids. (3) xiv. pp. 491–554.

Koch, L., & Keyserling, E. Die Arachniden Australiens nach der Natur beschrieben und abgebildet. Lief. 31 & 32.

Lief. 31 is devoted to the *Attidæ* (concluded), and completes vol. i. (*Araneæ*) of this work; Lief. 32 commences vol. ii., and contains the *Scorpiones*, *Pedipalpi*, and the commencement of the *Pseudoscorpiones*.

Kusta, J. Neue Arachniden aus der Steinkohlenformation von Rakonitz. SB. böhm. Ges. 1884, pp. 398–403, 1 pl.

Anthracomartus 2 spp., *Cyclophthalmus senior* (Corda) juv., *Rakovnicia* (g. n.) *antiqua*.

Lancelevée, T. Arachnides recueillis aux environs d'Elbeuf et sur quelques points des départements de la Seine inférieure et de l'Eure. Bull. Soc. Elbeuf, 1884, pp. 88–146.

The author records 288 Spiders, 6 Pseudoscorpions, 16 *Phalangida*.

Lankester, E. Ray. New Hypothesis as to the Relationship of the Lung-book of *Scorpio* to the Gill-book of *Limulus*. Q. J. Micr. Sci. xxv. pp. 339–342.

The author supposes that the lung-book of *Scorpio* is derived from the gill-book of *Limulus* by an invagination.

—— (assisted by W. B. S. Benham and Miss E. J. Beck). On the Muscular and Endoskeletal Systems of *Limulus* and *Scorpio*. Tr. Z. S. xi. pp. 311–384, pls. lxxii. & lxxxiii.

Contains :—I. Introduction, by E. Ray Lankester; II. Description of the muscular and endoskeletal systems of *Limulus*, by W. B. S. Benham; III. Description of the muscular and endoskeletal systems of *Scorpio*, by Miss E. J. Beck; IV. Comparison of the muscular and endoskeletal systems of *Limulus* and *Scorpio*, and consideration of the morphological significance of the facts recorded, by E. Ray Lankester; V. Notes on certain points in the anatomy and generic characters of Scorpions, by E. Ray Lankester.

Pavesi, P. Aracnidi raccolti dal conte Boutourlin ad Assab e Massaua. Bull. Ent. Ital. xvii. pp. 197–200.

There are recorded from Assab, 5 *Scorpiones*, 1 *Solifuga*, 3 *Araneæ*, 1 *Acarus*; from Massaua, 3 *Araneæ*.

Pelseneer, P. Les glandes coxales de *Mygale*. Bull. Sci. Nord, vii. & viii. No. 3, pp. 101–105, 1 pl.

——. On the Coxal Glands of *Mygale*. P. Z. S. 1885, pp. 3–6, pl. i.

The author describes the coxal glands of *Nemesia cæmentaria* and a "*Mygale*" from S. America.

Plateau, F. Sur le rôle des palpes chez les Myriapodes et les Arachnides; S. H. Gadeau de Kerville. Ann. Soc. Ent. Fr. (6) v. (Bull.) pp. 166 & 167.

The palps are of no value in mastication.

...S. H. A Contribution to our Knowledge of Palæozoic *Arachnida*. P. Am. Ac. (n.s.) xii. pp. 13–22.

There were the following orders in palæozoic times: *Anthracomarti* (fam. *Arthrolycosidæ*, *Poliocheridæ*, new, *Architarboidæ*, *Eophrynoidæ*), *Pedipalpi* (gen. *Geralinura*), *Scorpiones* (fam. *Eoscorpionidæ*), *Araneæ* (fam. *Liphistioidæ*, gen. *Protolycosa*, *Palaranea*).

Simon, E. Études arachnologiques. 17e Mémoire. Ann. Soc. Ent. Fr. (6) v. pp. 209–224. No. xxiv. Arachnides recueillis dans la vallée de Tempé et sur le mont Ossa (Thessalie). No. xxv. Description d'une nouvelle espèce de *Trogulus* (*T. torosus*) de Dalmatie.

——. Matériaux pour servir à la faune arachnologique de l'Asie méridionale. Bull. Soc. Zool. x pp. 1–39 & 436–462, pl. x.

——. Études sur les Arachnides recueillis en Tunisie, en 1883 et 1884, par MM. A. Letourneux, M. Sédillot, et Valéry Mayet; in Exploration scientifique de Tunisie. Paris: 1885, 8vo, pp. i.–iv. & 1–59.

208 *Araneæ*, 10 *Solifugæ*, 16 *Chernetinæ*, 6 *Scorpiones*, 10 *Opiliones*.

Szpadkowski, T. O obyczajach tarantuli i skorpijona [Habits of *Tarantulæ* and Scorpions]. Wszechswiat, iv. pp. 669–674.

ARANEIDEA.

Becker, L. Catalogue des Arachnides de Belgique. Révision des espèces belges de la famille des *Theridionidæ*. C.R. ent. Belg. 1885, pp. 93–100.

Bertkau, P. Ueber die Augen und ein als Gehörorgan gedeutetes Organ der Spinnen. SB. Niederrh. Ges. 1885, pp. 218–225 & 282–284.

——. Bemerkungen zu Schimkewitsch's Notiz: Sur un organe des sens des Araignées. Zool. Anz. viii. pp. 537 & 538.

——. Ueber den Saisondimorphismus und einige andere Lebenserscheinungen bei Spinnen. *T. c.* pp. 459–464.

Dahl, F. Zur Anatomie der Araneen. *T. c.* pp. 241–243.

——. Saison-Dimorphismus bei Spinnen. *T. c.* pp. 376 & 377.

——. Die Lebensdauer der Spinnen. *T. c.* pp. 629–631.

——. Versuch einer Darstellung der psychischen Vorgänge in den Spinnen. Vierteljahrschr. f. wiss. Philos. 9 Bd. pp. 84–103 & 162–190.

Emerton, J. H. New England *Lycosidæ*. Tr. Conn. Ac. vi. pp. 481–505, pls. xlvi.–xlix.

Karsch, F. Zur Frage: Saison-Dimorphismus bei Spinnen? Zool. Anz. viii. pp. 532 & 533.

Keller, C. Untersuchungen über die forstliche Bedeutung der Spinnen. Rec. Z. Suisse, ii. pp. 149–188, pl. vi.

Kulczynski, W. Halbierter Zwitter von *Erigone fusca*. Rozpraw Wydz. matem.-przyr. Akad. Umiej. xiv. pp. 169–199, pl. iv.

[Kulczynski, W.] *Araneæ* in Camtschadalia a Dybowski collec... Akad. umiej. wydz. mat. przyr. Krakau, xi. pp. 1–60, pls. ix.–xi.

66 species, 28 new; the others are identical with the Central-European species.

Locy, W. A. Treatment of the Eggs of the Spider (*Agalena naevia*). Am. Nat. 1885, pp. 1021–1022.

McCook, H. C. Hibernation and Winter Habits of Spiders. P. Ac. Philad. 1885, pp. 102–104.

Pavesi, P. Controsservazioni ad un opuscolo recente di Aracnologia. Bull. Ent. Ital. xvii. pp. 201–206.

Refers to Simon's "Matériaux pour servir à la faune des Arachnides de Grèce."

Schimkewitsch, W. Sur un organe des sens des Araignées. Zool. Anz. viii. pp. 464–466.

Simon, E. Matériaux pour servir à une faune arachnologique de la Nouvelle-Calédonie (2e mémoire). C.R. ent. Belg. 1885, pp. 87–92.

To the known species (41) are added 10 new (*Attidæ*).

Szpadkowski, T. Przewozenie zywych pajeków (Import of Living Spiders). Wszechswiat, iv. p. 639.

Teraphosidæ.

Simon regards the *Mecicobothrioidæ* [*cf.* Zool. Rec. xix. *Arachn.* p. 10] not as a family but as a lower group of the *Teraphosidæ*, to which also belong *Atypoides* (Cambr.), *Brachybothrium*, g. n., and *Hexura*, g. n. The types of the new genera are *Brachybothrium pacificum*, sp. n., Washington Territory, *accentuatum*, sp. n., N. Carolina; *Hexura picea*, sp. n., Washington Territory. Bull. Soc. Zool. ix. pp. 313–317.

Atypus piceus. Life-history; F. Enock, Tr. E. Soc. 1885, pp. 398 *et seq.* On the recept. semin. of this species see Bertkau, CB. Ver. Rheinl. 1884, p. 71, and Arch. mikr. Anat. xxiv. p. 420.

Van Hasselt obtained *Calommata fulvipes* (Luc.) from Java; the one pair of the side-eyes are not easily visible, and as the six-eyed genus *Pelecodon* (Dolesch.) is nearly allied to *Calommata*, the question arises whether the two genera are not identical; probably *Pelecodon sundaicus* (Dolesch.) = *Calommata fulvipes* (Luc.). Tijdschr. Ent. xxviii. p. 89, pl. v.; Versl. p. xi.

Sarpedon, g. n., for *S. robustus*, sp. n., Cambridge, P. Z. S. 1883, p. 353, pl. xxvi. fig. 1, Ceylon.

Atypoides, g. n., for *A. riversii*, sp. n., *id. t. c.* p. 354, fig. 2, California.

Phoneyusa, g. n. (between *Avicularia* and *Eurypelma*), for *P. belandana*, sp. n., Karsch, B. E. Z. 1884, p. 347, Niam-Niam, with a table of the species from Tropical Africa.

Pœcilotheria, n. n. for *Scurria* (præocc.) *fasciata*, Latr.; Simon, Bull. Soc. Zool. x. p. 38 (sep.). The species hitherto known only from Ceylon, occurs also in the district of Madura, India.

...SSELT, A. W. M., in the "Bijdrage over de nesten der zoge-...kende Metselpinnen," doubts whether the nest ascribed by Ausserer to *Eurypelma steindachneri* really belongs to this species; Tijdschr. Ent. xxvi. pp. 229 *et seq.*

Cryptothele cristata, sp. n., E. Simon, C.R. ent. Belg. 1884, p. 302, Mexico.

Cyrtocarenum. Greek species tabulated (*C. jonicum*, *lapidarium*, *hellenum*, *grajum*, *cunicularium*); *id.* Ann. Soc. Ent. Fr. 1884, p. 384.

Idiops crassus, sp. n., *id.* Ann. Mus. Genov. xx. p. 357, Burmah.

Ischnocolus fuscostriatus, sp. n., *id.* Explor. Tunisie, p. 41.

Nemesia cæmentaria. Nest described; Stirrup, P. Manch. Soc. xxiv. pp. 17 & 18.

Phrictus flavopilosus, sp. n., E. Simon, Ann. Mus. Genov. xx. p. 358, Burmah.

Selenocosmia greeffi, sp. n., F. Karsch, SB. Ges. Marb. 1884, p. 60, S. Thomé.

Sphærobothria hoffmanni (Karsch). ♂ described; F. Karsch, Abh. Ver. Brem. ix. p. 40.

Dysderidæ.

Xestaspis, g. n. Allied to *Gamasomorpha*; differing in the clypeus being narrower than the anterior eyes, and the legs not being aculeated; for *X.* (*Oonops*) *loricata* (L. Koch) and *nitida*, sp. n., Bou-Saada; E. Simon, Bull. Soc. Zool. ix. p. 324.

Dysdera cribellata, p. 294, fig. 17, *macra*, p. 295, fig. 18, *verneaui*, p. 296, fig. 19, *insulana*, p. 297, fig. 20, spp. nn., all from the Canaries, *id.* Ann. Soc. Ent. Fr. 1883, pl. viii.

Harpactes krueperi, p. 344, Athens, *abantinus*, p. 345, Eubœa, spp. nn., *id. op. cit.* 1884.

Leptoneta spinimana, sp. n., *id.* Bull. Soc. Zool. ix. p. 325, Blidah, Algiers.

Segestria davidi, sp. n., *id.* Ann. Soc. Ent. Fr. 1884, p. 190, Beirut.

Attidæ.

Kulczynski, W. Conspectus Attoidarum Galiciæ. Rozpraw i Sprawozdan Wydz. matem.-przyr. Akad. Umiej. xii. pp. 135–232, pls. vii. & viii.

The author records from Gallicia 46 species, 8 of which for the first time, and gives synonymical notes on many species:—*Synageles hilarulus*, *Heliophanus*, *Marptusa*, *Dendryphantes hastatus*, *D. bombycius*, *D. rudis*, *Philœus*, *Hasarius arcuatus*, *H. falcatus*, *Attus floricola*, *A. rupicola*, *Ictidops*, *Euophrys monticola*.

Peckham, G. W., & E. G. Descriptions of New or Little-known Spiders of the Family *Attidæ*, from various parts of the U. S. of North America. Milwaukee: 1883, pp. 1–35, with 3 pls.

The author describes *Epiblemum palmarum*, *Synemosyna formica*, *Attus cardinalis*, *A. tripunctatus* of Hentz, and 21 spp. nn.

*[Peckham, G. W., & E. G.] On some New Genera and Spe[illegible] family *Attidæ*, from Madagascar and Central America. P. N. [illegible] Soc. Wisc.

Simon, E. Note sur le groupe des *Diolenii*. C.R. ent. Belg. 1884, pp. 215–231.

The author places in this group, which is characterized by the prolongation of the trochanter of the first pair of legs, the genera *Atrytone* (Keys.), *Diolenius* (Thor.), *Discocnemius* (Thor.), and the new ones *Lystroct[e]isa* and *Chalcolecta*. The genera are characterized by the following table :—

1. Trochanter 1 coxa multo longior, femore parum brevior
   „ „ „ brevior (præsertim in ♀), femore multo brevior . . . . . .
2. Cephaloth. humilis, quadrangulus oculorum quam longior latior, tibia 1 gracilis parallela . . . . *Atrytone* (Keys.)
   Ceph. sat altus, quadr. ocul. fere æque longus ac latus, tibia 1 compressa plus minus dilatata . . . *Diolenius* (Thor.)
3. Quadrang. oculorum multo longior quam latior *Lystroct[e]isa*, g. n.
   „ „ fere æque longus ac latus . . .
4. Pedes breves, tibia antica valde compressa et dilatata, spinarum validarum seriebus 2 atque linea media pilorum crassorum infra instructa . . *Discocnemius* (Thor.)
   Pedes longi, tibia antica compressa parallela, haud dilatata, spinis validis et numerosis biseriatim dispositis infra armata . . . . . *Chalcolecta*, g. n.

Ælurillus, n. n. for *Ictidops*, preoccupied ; E. Simon, Ann. Soc. Ent. Fr. 1884, p. 313.

Neætha, n. n. for *Neæra*, preocc. ; *id.* Explor. Tunisie, p. 5.

Ericulus, n. n. for *Scythropa* (Keys.) ; *id.* C.R. ent. Belg. xxix. p. 88.

Epicalus, n. n. for *Ephippus* (Thor.) ; *id.* Bull. Soc. Zool. x. p. 3 (sep.).

Thyene, n. n. for *Thya* (Sim.) ; *id. t. c.* p. 4.

Mithion, g. n. Allied to *Marptusa* and *Hyctia*, for *M. semiargenteus*, sp. n. ; *id. op. cit.* ix. p. 5 (sep.) pl. i. fig. 2, from Khartoum.

Wala, g. n., allied to *Hyllus*, for *W. albovittata*, sp. n., p. 517, fig. 20, N. America ; *Agobardus*, g. n., for *A. anormalis*, sp. n., p. 519, fig. 21, N. America ; E. Keyserling, Verh. z.-b. Wien, 1884, pl. xiii.

Pirithous, n. n. for *Eulabes*, preocc. ; *Sinnamora*, n. n. for *Tanupus*, preocc. ; *Drepanephora*, n. n. for *Acmæa*, preocc. ; *id.* Arachn. Austr. i. p. 1477.

Lauharulla, g. n., allied to *Cyrba*, for *pretiosa*, sp. n., Sydney, p. 1432, pl. cxxi. fig. 3 ; *Scythropa*, g. n. (= *Ericulus*, vide *suprà*), for *maculata*, sp. n., Sydney, Peak Downs, p. 1447, pl. cxxii. fig. 4 ; *id. t. c.*

Sandalodes, g. n., for (*Mopsus*) *bipenicillatus*, *albobarbatus* ; *id. t. c.* p. 1476.

Trite, g. n. Allied to *Cyrba* and *Astia*, for *T. pennata*, p. 91, *lineata*, p. 92, spp. nn., Numea ; E. Simon, C.R. ent. Belg. 1885.

Harmochirus, g. n. Allied to *Rhombonotus*, for (*Rhomb.*) *similis* (van

...au *malaccensis*, sp. n., Kinta Valley; *id.* Bull. Soc. Zool. x. ... (sep.).

Pseudicius, g. n. Allied to *Icius*, for (*Dendryph.*) *encarpatus* (Walck.), *Calliethera icioides*, &c., and *modestus*, sp. n., Ramnad; *id. t. c.* p. 28, pl. x. fig. 2.

Stagetillus, g. n., differing from *Bavia* by the cephalothorax being much longer, &c., for *opaciceps*, sp. n., p. 32, Bodjo; *Ptocasius*, g. n., allied to *Hasarius*, for *weyersi*, sp. n., p. 35, Fort de Kock: *Pseudamycus*, g. n., for (*Amycus*) *albomaculatus* (van Hass.), p. 35; *id.* C.R. ent. Belg. 1885.

Acompse (L. Koch) = *Bavia* (Sim.); Keyserling, Arachn. Austr. i. p. 1477.

Acmæa (= *Drepanephora*, *vide suprà*) *villosa*, sp. n., *id. t. c.* p. 1421, pl. cxx. fig. 3, Sydney.

Acompse (*Bavia*, Sim., *vide suprà*) *modesta*, sp. n., *id. t. c.* p. 1455, pl. cxxii. fig. 8, Cape York.

Ælurillus (g. n., *vide suprà*) *mayeti*, Iles de Kerkenna, Explor. Tunisie, p. 4, *tigrinus*, Collegal, Bull. Soc. Zool. x. p. 21 (sep.), spp. nn.; ... Simon.

Asamonea puella, sp. n., *id. t. c.* p. 27, Landana, Congo.

Attus putnamii, p. 1, pl. i. fig. 1, Iowa, *æstivalis*, p. 2, fig. 2, Pennsylvania, *splendens*, p. 4, fig. 3, Wisconsin, *8-punctatus*, p. 6, fig. 4, Missouri, *hoyi*, p. 7, fig. 5, Pennsylvania, Missouri, *flavus*, p. 9, fig. 6, Pennsylvania, *rusticolus*, p. 10, fig. 7, Wisconsin, *tibialis*, p. 11, fig. 8, Wisconsin, *agrestis*, p. 12, fig. 9, Pennsylvania, *arizonensis*, p. 13, pl. ii. fig. 10, Arizona, *miniatus*, p. 15, fig. 11, Florida, *m'cookii*, p. 16, fig. 12, locality not given, *peregrinus*, p. 17, fig. 13, Connecticut, *princeps*, p. 18, fig. 14, Pennsylvania, *quadrilineatus*, p. 19, fig. 15, Pennsylvania, Wisconsin, *pinus*, p. 20, fig. 16, Wisconsin, *johnsonii*, p. 22, fig. 17, Washington Territory, *formosus*, p. 23, fig. 18, Iowa, *albo-immaculatus*, p. 24, fig. 19, Iowa, *palustris*, p. 25, pl. iii. fig. 20, Wisconsin, *mannii*, p. 27, fig. 21, Florida, spp. nn., Peckham, *t. c.*; *ruficarpus*, sp. n., E. Simon, Ann. Soc. Ent. Fr. 1884, p. 313, Athens, Eubœa.

Ballus depressus var. n. *pœcilus*, Bertkau, Verh. Ver. Rheinl. 1883, p. 208.

Calliethera icioides, sp. n., E. Simon, Bull. Soc. Zool. ix. p. 2 (sep.), pl. i. fig. 1, Khartoum.

Chalcolecta (g. n., *vide suprà*) *dimidiata*, p. 230, Gilolo, *bitæniata*, p. 231, Gilolo, spp. nn., *id.* C.R. ent. Belg. 1884.

Chalcoscirtus elegans, sp. n., *id. op. cit.* 1885, p. 90, Numea.

Cyrba micans, Collegal, *id.* Bull. Soc. Zool. x. p. 22 (sep.); *C. squalida*, p. 1436, pl. cxxi. figs. 5 & 6, Peak Downs, Caigan, Shelley's Flat, *bimaculata*, p. 1439, fig. 17, Sydney, *villosa*, p. 1444, pl. cxxii. fig. 3, Australia, Keyserling, Arachn. Austr. i.: spp. nn.

Dendryphantes flavicomis, sp. n., E. Simon, Ann. Soc. Ent. Fr. 1884, p. 308, Athens.

Diolenius bicinctus, sp. n., Gilolo, *id.* C.R. ent. Belg. 1884, p. 227.

Discocnemius albocingulatus, p. 229, *coccineopilosus*, p. 230, Dorey, *id. t. c.*

Ephippus americanus, sp. n., Keyserling, Verh. z.-b. Wien, 1884, p. 506, pl. xiii. fig. 13.

Ergane tæniata, N. America, *id. t. c.* p. 507, fig. 14 ; *nigra*, Rockhampton, *id.* Arachn. Austr. i. p. 1463, pl. cxxiii. fig. 5 ; *coronata*, Fort-de-Kock, Simon, C.R. ent. Belg. 1885, p. 33. (*Hasarius*) *arcuatus*, *falcâtus*, *lætabundus*, *jucundus*, are of the same genus ; *Hasarius* is confined to *adansoni* ; *id. t. c.* p. 34.

Euophrys monticola, Kulczynski, Consp., &c., p. 227, pl. viii. fig. 22, Gallicia ; *semirufa*, E. Simon, Ann. Soc. Ent. Fr. 1884, p. 182, Beirut ; *obscurofemoratus*, Keyserling, Arachn. Austr. i. p. 1481, pl. cxxi. fig. 2, Sydney : spp. nn.

Euryattus senex, sp. n., E. Simon, C.R. ent. Belg. 1885, p. 90, Numea.

Habrocestum cupidon, sp. n., *id. t. c.* p. 89, Numea.

Hadrosoma ephippigerum, sp. n., *id. t. c.* p. 36, Bodjo.

Heliophanus camtschadalicus, sp. n., Kulczynski, Aran. Camtsch. p. 58, pl. xi. fig. 35, Kamtschatka.

Homalattus septentrionalis, sp. n., Keyserling, Verh. z.-b. Wien, 1884, p. 515, pl. xiii. fig. 19.

Ascyltus penicillatus (Karsch) = (*Hyllus*) *pterygodes* (L. Koch) ; *Ascyltus penicillatus* (Keys.) = *Mopsus mormon* (Karsch) ; *id.* Arachn. Austr. i. p. 1477.

Hyllus morgani, sp. n., E. Simon, Bull. Soc. Zool. x. p. 2 (sep.), Kinta Valley.

Icius ocellatus, Pavesi, Ann. Mus. Genov. xx. p. 85, Scioa ; *I. elegans*, N. America, p. 499, fig. 8, *nigromaculatus*, Utah, p. 500, fig. 9, *albovittatus* !, Massachusetts, p. 502, fig. 10, *crassiventer*, Massachusetts, p. 503, fig. 11, *vittatus*, N. America, p. 504, fig. 12, Keyserling, Verh. z.-b. Wien, 1884, pl. xiii. ; *parvulus*, Sydney, p. 1449, pl. cxxii. fig. 5, *albovittatus* !, Peak Downs, p. 1451, fig. 6, *id.* Arachn. Austr. i. (*Marptusa*) *marita* (Karsch) belongs to the genus *Icius* ; the "vulva" is figured in fig. 4 ; Karsch, SB. Ges. Marb. 1884, p. 64.

Ictidops (*Ælurillus*, Sim., *vide suprà*) *fasciatus*, ♂ pull. is of the same colour as the adult male ; Bertkau, Verh. Ver. Rheinl. 1883, p. 207.

Lystroct[e]isa (g. n., *vide suprà*) *myrmex*, sp. n., Simon, *t. c.* p. 229, Numéa.

Mævia quadricincta, sp. n., *id.* Bull. Soc. Zool. x. p. 18 (sep.), Singapore.

Menemerus marginellus, Cape Verde Is., *id.* Ann. Soc. Ent. Fr. 1883, p. 303, pl. viii. fig. 21 ; *cruciferus*, S. Carolina, Keyserling, Verh. z.-b. Wien, 1884, p. 513, pl. xiii. fig. 18 : spp. nn.

Mogrus fabrei, Ramnad, p. 29 (sep.), *ornatus*, Kinta Valley, p. 4, spp. nn., Simon, Bull. Soc. Zool. x.

Opisthoncus aurantiacus, sp. n., *id. t. c.* p. 30, Ramnad ; *grassator*, p. 1457, pl. cxxiii. fig. 12, Peak Downs, *clarus*, p. 1461, fig. 3, Peak Downs, spp. nn., Keyserling, Arachn. Austr. i.

Pellenes nigriceps, sp. n., Keyserling, Verh. z.-b. Wien, 1884, p. 512, pl. xiii. fig. 17.

Phidippus purpuratus, p. 489, fig. 1, Maine, *albomaculatus*, p. 491, fig. 2, Massachusetts, California, *pulcherrimus*, p. 492, fig. 3, Florida, *ruber*, p. 493, fig. 4, Massachusetts, *gracilis*, p. 495, fig. 5, Kentucky, *bicolor*, p. 496, fig. 6, Utah, *clarus*, p. 497, fig. 7, Maryland, spp. nn., *id. t. c.*

[illegible] superciliosus, sp. n., Bertkau, Verh. Ver. Rheinl. 1883, p. 277, pl. iii. fig. 8, Aix-la-Chapelle, probably imported with Campeachy wood.

Plexippus dæmelii, sp. n., Keyserling, Arachn. Austr. i. p. 1427, pl. cxxi. fig. 1, Sydney.

Prostheclina signata, sp. n., *id. t. c.* p. 1464, pl. cxxiii. fig. 6.

Pseudicius (g. n., *vide suprà*) *tamaricis*, Simon, Explor. Tunisie, p. 2, Gafza, Tozzer; *P. decemnotatus*, *id.* Bull. Soc. Zool. x. p. 17, Singapore: spp. nn.

Saitis x-notata, Keyserling, Verh. z.-b. Wien, 1884, p. 510, pl. xiii. fig. 16; *S. taniata*, *id.* Arachn. Austr. i. p. 1434, pl. cxxi. fig. 4; *S. chaperi*, Simon, *t. c.* p. 6 (sep.), Gundacul: spp. nn.

Salticus luridus, sp. n., *id. t. c.* p. 18, Singapore.

Simætha aheneola, sp. n., *id. t. c.* p. 19, Singapore.

Synageles confusus, sp. n., from Bavaria, Gallicia, till now confounded with *S. hilarulus*, Kulczynski, Conspect. Attoid. p. 192, pl. vii. fig. 1.

Thiania suavis, sp. n., E. Simon, Bull. Soc. Zool. x. p. 41 (sep.), Kinta Valley.

Thyene (*vide suprà*) *semicuprea*, sp. n., *id. t. c.* p. 4, pl. x. fig. 1.

Vicirja albolimbata, sp. n., *id.* C.R. ent. Belg. 1885, p. 321, Fort-de-Kock.

Palpimanidæ.

Stenochilus crocatus, p. 341, Burmah, *raudus*, p. 368, Pondicherry, spp. nn., E. Simon, Ann. Mus. Genov. xx.

Thomisidæ.

Cyrsillus, g. n., for *C. drassiformis*, sp. n., p. 358, pl. xxxvi. fig. 4, Caffraria; *Casturopoda*, g. n., for *C. sigillata*, sp. n., pp. 359 & 360, pl. xxxvii. fig. 5, Ceylon; *Nesis*, g. n., allied to *Diæa*, for *N. nigropunctatus*, sp. n., p. 361, fig. 6, Caffraria; *Palæphatus*, g. n., for *P. salticiformis*, sp. n., p. 362, fig. 7, Ceylon; *Pherecydes*, g. n., allied to *Monastes*, for *P. tuberculatus*, sp. n., p. 363, fig. 8, Caffraria: Cambridge, P. Z. S. 1883.

Ornithoscatoides, g. n., for (*Thomisus*) *decipiens* (Forbes), *tuberosus* (Blackw.); *id. op. cit.* 1884, p. 198.

Ebo, g. n. *Philodromin.*, for *E. latithorax*, sp. n., Keyserling, Verh. z.-b. Wien, 1883, p. 678, pl. xiii. fig. 26, Richmond, Virginia.

Alcimochthes, g. n., allied to "*Amycle*," for *A. limbatus* (or *albolimbatus*, s. fig.), sp. n., p. 13, pl. x. fig. 16, Malacca; *Amycinea*, n. n. for *Amycle* (Cambr.), preocc., p. 12, note; *Aspectromerus*, g. n., allied to *Stiphropus*, for *A. duriusculus*, sp. n., p. 17, pl. x. figs. 13 & 14, Gundacul; *Cetuma*, g. n., allied to *Diæa*, for *C. morgani*, sp. n., fig. 9, Kinta Valley; *Strigoplus*, g. n., allied to *Tmarus* and *Pherecydes*, for *S. albostriatus*, sp. n., p. 11, Kinta Valley: E. Simon, Bull. Soc. Zool. x.

Cyrsillus (Cambr.) = *Stiphropus*; Simon, *t. c.* p. 19.

Artanes hiulcus, sp. n., Pavesi, Ann. Mus. Genov. xx. p. 55, Mahal-Uonz.

Diæa imitatrix, p. 59, Let-Marefia, *albicincta*, p. 61, Let-Marefia,

spp. nn., *id. t. c.*; *D. punctata*, sp. n., Karsch, SB. Ges. [illegible] p. 66, S. Thomé, Rolas; *D. pougnēti*, sp. n., Simon, Bull. Soc. Zool. [illegible] p. 25, Collegal.

Misumena alabamensis, sp. n., Keyserling, Verh. z.-b. Wien, 1883, p. 666, pl. xxi. fig. 15, Selma.

Monaeses caudicula, sp. n., Simon, Ann. Soc. Ent. Fr. 1884, p. 324, Athens.

Ornithoscatoides (*vide suprà*) *decipiens* (Forbes), *tuberosus* (Blackw.), figured; *O. ceylonica*, p. 201, fig. 3, *nigra*, p. 202, fig. 4, spp. nn., Ceylon: Cambridge, *t. c.* pl. xv.

Oxyptila monroensis, Keyserling, Verh. z.-b. Wien, 1883, p. 671, pl. xxi. pl. xv., Fort Monroe; *C. theobaldi*, Simon, Bull. Soc. Zool. x. p. 24, pl. x. fig. 15: spp. nn.

Philodromus claræ (Bertkau) = *P. rufus* (Walck.), and perhaps = *clarkii* (Blackw.); Bertkau, Verh. Ver. Rheinl. 1883, p. 209. *P. alascensis*, p. 674, fig. 22, Alaska, *obscurus*, p. 675, fig. 23, Washington, *californicus*, p. 676, fig. 24, San Francisco, *marxii*, p. 677, fig. 25, Columbia, spp. nn., Keyserling, Verh. z.-b. Wien, 1883; *P. buxi*, sp. n., Simon, An. Soc. Esp. xiii. p. 115, Miranda-de-Ebro; *P. ruficapillus*, sp. n., *id.* Explor. Tunisie, p. 18, Aïn-Draham; *P. morsus*, sp. n., Karsch, SB. Ges. Marb. 1884, p. 66, fig. 7, Rolas.

Synæma bicolor, sp. n., Keyserling, Verh. z.-b. Wien, 1883, p. 667, pl. xxi. fig. 16, Entreprise, Florida; *S. quadrinotatum*, sp. n., Simon, Bull. Soc. Zool. 1884, p. 11 (sep.), Khartoum.

Thomisus albohirtus, sp. n., *id. t. c.* p. 13.

Tmarus griseus, p. 672, fig. 20, Crescent City, Florida, *floridensis*, p. 673, fig. 21, Florida, spp. nn., Keyserling, Verh. z.-b. Wien, 1883, pl. xxi.

Xysticus borealis, p. 668, fig. 17, Alaska, *nigromaculatus*, p. 670, fig. 18, Colorado, spp. nn., *id. t. c.*; *X. hamatus*, sp. n., *id. op. cit.* 1884, p. 521, pl. xiii. fig. 22, Kentucky; *X. squalidus*, p. 286, *verneaui*, p. 287, pl. viii. fig. 13, spp. nn., from the Canaries, Simon, Ann. Soc. Ent. Fr. 1883; *X. cribratus*, sp. n., *id.* Explor. Tunisie, p. 15, Sfax, Gabès; *X. excellens*, sp. n., Kulczynski, Aran. Camtsch. p. 47, pl. xi. fig. 26, Kamtschatka.

Sparassidæ.

Nonianus, g. n., allied to *Olios*, for *N. pictus*, sp. n., Simon, Explor. Tunisie, p. 13.

Thelictopis, n. n. for *Themeropis* (L. Koch), preocc.; Karsch, SB. Ges. Marb. 1884, p. 65.

Cebrennus tunetanus, sp. n., Simon, Explor. Tunisie, p. 18, El Kef.

Heteropoda leprosa, sp. n., *id.* Ann. Mus. Genov. xx. p. 336, Burmah; *H. sexpunctata*, p. 14, pl. x. fig. 11, Gundacul, *fabrei*, p. 32, fig. 10, Ramnad, spp. nn., *id.* Bull. Soc. Zool. x.

Midamus auricomis, *baulnyi*, and *longipes*, sp. n., from Khartoum, tabulated; Simon, Bull. Soc. Zool. 1884, pp. 8 *et seq.* pl. i. figs. 13–15.

Olios (*Selenops*) *aissa* (Walck.), from Tortugas I., Florida, described and figured by Keyserling, Verh. z.-b. Wien, 1883, p. 683, pl. xxi. fig. 30. *O. abnormis*, p. 679, fig. 27, Sa. Fé, New Mexico, *giganteus*, p. 681,

... concolor, from Punta del Aqua, New Mexico, spp. nn., *id. l. c.*; *O. punctipes*, p. 339, Burmah, *versicolor*, p. 367, Bankok, spp. nn., Simon, Ann. Mus. Genov. xx.

Thanatus indicus, sp. n., *id.* Bull. Soc. Zool. x. p. 16, Gundacul; *T. nigromaculatus*, sp. n., Kulczynski, Aran. Camtsch. p. 49, pl. xi. fig. 29, Kamtschatka.

Bradystichidæ (fam. n.)

Simon, in C.R. ent. Belg. 1884, p. 297, establishes this new family, which is intermediate between the *Thomisidæ* and *Drassidæ*, for two new genera, *Bradystichus* and *Borboropactus*, which are to be separated as follows :—

Borboropactus, g. n. Oculi 4 antici æqui, lineam rectam, 4 postici lineam parum recurvam formantes. Pars labialis longior quam latior; laminæ sat angustæ; metatarsi crassi et depressi.

Bradystichus, g. n. Oculi 4 antici lineam valde procurvam, 4 postici lineam validisime recurvam formantes; medii antici et postici majores quam laterales. Pars labialis latior quam longior; laminæ latæ; metatarsi sat angusti et fere cylindrici.

The species are :—*Bradystichus crispatus* and *calligaster*, spp. nn., from New Caledonia, p. 299; *Borboropactus bituberculatus*, Moluccas, and *squalidus*, Zambesi, spp. nn., p. 301; *Thomisus* (?) *cinerascens* (Dolesch.) also belongs to the genus *Borboropactus*.

Anyphænidæ.

Simon, in Bull. Soc. Zool. 1884, p. 14 (sep.), establishes the new subfam. *Anyphœninæ*, with 5 S. American genera :

Gayenna, Nic., *Liparotoma*, g. n., *Axyracrus*, g. n., *Tomopisthes*, g. n., *Coptoprepes*, g. n. *Heteromma* (Karsch) = *Gayenna* (Nic.).

The following new species are described, all from Terra del Fuego :—*Gayenna coccinea*, pl. iii. fig. 15, *stellata*, fig. 16, p. 15, *Tomopisthes immanis*, p. 17, *varius*, p. 18, figs. 17 & 18, *vittatus*, p. 19; *Coptoprepes flavopilosus*, p. 21; *Liparotoma hyadesi*, fig. 19, *amœnum*, p. 22, *nigropictum*, p. 23; *Axyracrus elegans*, p. 24, fig. 20.

Drassidæ.

Amaurobioides, g. n., for *A. maritima*, sp. n., Otago, on rocks in the sea; Cambridge, P. Z. S. 1883, p. 356, pl. xxxvi. fig. 3.

Philisca, g. n., allied to *Clubiona*, for *P. hahni*, sp. n., Simon, Bull. Soc. Zool. 1884, p. 13 (sep.), pl. iii. fig. 14, Ile Hoste.

Storenomorpha, g. n. of the subf. *Œdignathin.*, for *S. comottoi*, sp. n., *id.* Ann. Mus. Genov. xx. p. 352, Burmah.

Bona, n. n. for *Micariolepis* (Sim.), vox hybrid.; Pavesi, *t. c.* p. 466.

Cœnoptychus, g. n., allied to *Corinna*, for *C. pulcher*, sp. n., Ramnad, p. 37; Simon, Bull. Soc. Zool. x.

Melicymnis, allied to *Echemus*, for *M. bicolor*, sp. n., Gundacul, p. 23, pl. x. fig. 22; *id. t. c.*

Anahita mamma, sp. n., Karsch, SB. Ges. Marb. 18[illegible] fig. 1, Rolas.

Chiracanthium aculeatum, sp. n., Simon, Bull. Soc. Zool. 1884, p. 26 (sep.), figs. 5 & 6, Khartoum; *C. orientale*, sp. n., Kulczynski, Arau. Camtsch. p. 45, pl. xi. fig. 25, Kamtschatka.

Clubiona rivalis, p. 45, Mahal-Uonz, *latitans*, p. 47, Let-Marefia, spp. nn., Pavesi, *t. c.*; *C. picta*, sp. n., Kulczynski, *t. c.* p. 44, fig. 23.

Drassus myogaster (Bertk.) = *D. lapidicola* ♀ after oviposition; Bertkau, Verh. Ver. Rheinl. 1883, p. 211. *D. furtadoi*, sp. n., Simon, Ann. Soc. Ent. Fr. 1883, p. 275, pl. viii. figs. 8 & 9, Ponta Delgada; *D. corcyræus*, sp. n., *id. op. cit.* 1884, p. 340, Corfu; *D. viduatus*, sp. n., Pavesi, *t. c.* p. 49, Daimbi.

Echemus rhenanus, sp. n. (?, perhaps = *Drassus angustifrons* of Westring), Bertkau, *t. c.* p. 222, pl. iii. fig. 1; *E. canariensis*, sp. n., Simon, Ann. Soc. Ent. Fr. 1883, p. 292, pl. viii. fig. 16; *E. chaperi*, *id.* Bull. Soc. Zool. x. p. 22 (sep.) pl. x. fig. 21, from Gundacul; *E. fuscipes*, *simplex*, *id.* Explor. Tunisie, p. 36, from Tunis, spp. nn.

Gnaphosa scioana, from Let-Marefia, Giagaguè, p. 52, *quagga*, Tunis, p. 468, spp. nn., Pavesi, *t. c.*; *G. stussineri*, sp. n., Simon, Ann. Soc. Ent. Fr. 1885, p. 213, Ossa, Thessaly.

Megamyrmecion algericum, p. 37, Gafsa, *pumilum*, p. 38, Gabès, spp. nn., *id.* Explor. Tunisie.

Micaria triguttata, sp. n., *id.* An. Soc. Exp. xiii. p. 122; *M. centrocnemis*, p. 42, fig. 21, *humilis*, p. 43, fig. 22, spp. nn., from Kamtschatka, Kulczynski, *t. c.*

Miltia = *Prodidomus* (Hentz), forming, with *Zimiris* (Sim.) and *Trochanteria* (Karsch), the group *Prodidomidæ*; Simon, C.R. ent. Belg. 1884, p. 302.

Miltia (*Prodidomus*) *flavida*, Algiers, *chaperi*, Hindostan, p. 140, *gulosa*, Noumea, p. 141, spp. nn., *id. t. c.*

Prosthesima oceanica, p. 273, fig. 6, *setifera*, p. 274, fig. 7, spp. nn., *id.* Ann. Soc. Ent. Fr. 1883, pl. viii.; *P. berytensis*, p. 188, and *davidi*, p. 189, from Beirut, *ilotarum*, p. 341, Naxos, Athens, spp. nn., *id. op. cit.* 1884; *P. birmanica*, sp. n., *id.* Ann. Mus. Genov. xx. p. 351, Burmah; *P. pexa*, *id.* Bull. Soc. Zool. x. p. 21 (sep.) pl. x. fig. 20, *barbara*, *id.* Explor. Tunisie, p. 35, Tunis, spp. nn.

Pythonissa convexa, sp. n., *id.* Ann. Soc. Ent. Fr. 1883, p. 291, Canaries; *passerina*, sp. n., *id.* Ann. Mus. Genov. xx. p. 350.

Sagana erythrina, sp. n., Pavesi, *t. c.* p. 43, Let-Marefia.

Tephlea limbata, sp. n., Simon, Bull. Soc. Zool. x. p. 36 (sep.), Ramnad, Egypt.

Tylophora cecchii, sp. n., Pavesi, *t. c.* p. 50, Let-Marefia.

Zimiris indica, sp. n., Simon, C.R. ent. Belg 1884, p. 141, Ramnad.

Cryptothelidæ.

Regillus, g. n., for *R. asper*, sp. n., Cambridge, P. Z. S. 1884, p. 204, pl. xv. fig. 5, Ceylon.

Cryptothele cristata, sp. n., Simon, C.R. ent. Belg. 1884, p. 302, Mexico.

Ctenidæ.

Ctenus (*Phoneutria*) *torvus*, sp. n., Pavesi, Ann. Mus. Genov. xx. p. 79, Scioa.

Leptoctenus denticulatus, sp. n., Simon, *t. c.* p. 355, Burmah.

Lycosidæ.

Peucetia aurora. Nest and mimicry; McCook, P. Ac. Philad. 1883, p. 277.

Diapontia kochii (Keys.) hunts in the water after tadpoles; Berg, An. Soc. Arg. xv. p. 240.

Trochosa terminalis (Bertkau) = *sabulonum* (L. Koch). The species is recorded from Cologne and the Ahr Valley; Bertkau, *t. c.* p. 217.

Peucetia virescens (Cambr.): ♂ described; Simon, Ann. Soc. Ent. Fr. 1884, p. 183. *P. lucasi*, *pulchra*, *striata*, tabulated; *id.* Bull. Soc. Zool. 1884, p. 7, figs. 10–12.

New genera and species:—

Chiasmopes, *Oxyopin.*, for *C. comatus*, sp. n., Pavesi, *t. c.* p. 79, Scioa.

Hippasa, allied to *Pirata*, for *H.* (*Lycosa*) *greenalliæ* (Blackw.), = *Pirata agelenoides* (Sim., *vide infrà*); Simon, Bull. Soc. Zool. x. p. 31 (sep.) pl. x. figs. 6 & 7.

Tapponia, allied to *Oxyopes*, for *T. micans*, sp. n., *id.* C.R. ent. Belg. 1885, p. 37, Bodjo.

Titurius, allied to *Dolomedes*, for *T.* (*Ctenus*) *fimbriatus* (Walck.) and *T. marginellus*, sp. n., *id.* Ann. Mus. Genov. xx. p. 328.

The name *Titurius* is changed (because preocc., *Coleopt.*) in *Thalassius*; *id.* Bull. Soc. Zool. x. p. 13, note.

Aulonia aurantiaca, Emerton, *t. c.* p. 499, pl. xlix. fig. 6, Connecticut.

Dolomedes fontanus, *id. t. c.* p. 502, fig. 10, New Hampshire; *D. massajæ*, Pavesi, *t. c.* p. 69, Let-Marefia.

Evippa rubiginosa, Simon, Bull. Soc. Zool. x. p. 11, Gundacul.

Lycosa maritima, Dahl, Schr. Nat. Ver. Schleswig, v. p. 67, Baltic; *L. açorensis*, p. 262, *furtadoi*, p. 263, Sao-Miguel, *fulviventris*, p. 285, pl. viii. fig. 12, Canaries, Simon, Ann. Soc. Ent. Fr. 1883; *L. birmanica*, *id.* Ann. Mus. Genov. xx. p. 333, Burmah; *L. martinii*, p. 64, Mahal-Uonz, Let-Marefia, *saltuaria*, p. 66, Fecheriè-Ghem, Pavesi, *t. c.*; *partita*, Simon, Bull. Soc. Zool. x. p. 12 (sep.), pl. x. fig. 5, Gundacul; *semicana*, *id. t. c.* p. 7, Kinta Valley; *L. lapidicina*, p. 494, pl. xlviii. fig. 5, Massachusetts, Connecticut, *brunnea*, fig. 4, Mount Washington, *albomaculata*, fig. 3, White Mountains, *pallida*, fig. 3, Massachusetts, Connecticut, pl. xlix. fig. 3, *bilineata*, fig. 4, p. 496, Connecticut, *albopatella*, fig. 2, Massachusetts, Connecticut, *nigropalpis*, fig. 1, p. 497, Massachusetts, *montana*, p. 498, fig. 5, Mount Washington, Emerton, *t. c.*; *L. camtschadalica*, Kulczynski, *t. c.* p. 52, pl. xi. fig. 31, Kamtschatka; *L. bacchabunda*, p. 63. fig. 2, Rolas, *gulosa*, p. 64, fig. 3, St. Thomé, Karsch, SB. Ges. Marb. 1884.

Ocyale æthiopica, Pavesi, *t. c.* p. 71, Daimbi, Keren.

Peucetia nigropunctata, Simon, Ann. Mus. Genov. xx. p. 365, Coromandel.

Pirata (?) *agelenoides*, *id. t. c.* p. 334, Burmah (= *Hippasa greenalliæ*, Blackw., *vide suprà*) ; *P. insularis*, p. 492, pl. xlviii. fig. 8, *montanus*, fig. 9, White Mountains, *minutus*, fig. 10, p. 493, Massachusetts, Connecticut, Emerton, *t. c.* ; *P. raptor*, p. 55, pl. xi. fig. 33, *prædo*, p. 56, fig. 34, Kamtschatka, Kulczynski, *t. c.*

Tarentula australis, Simon, Bull. Soc. Zool. 1884, p. 3 (sep.), pl. iii. fig. 1, Chiloe, Ile Hoste ; *T. nigrotibialis*, *id.* Ann. Mus. Genov. xx. p. 330, Burmah ; *T. chaperi*, p. 8, pl. x. fig. 3, *leucostigma*, p. 10, both from Gundacul, *id.* Bull. Soc. Zool. x. ; *T. canicularia*, p. 7, Tunis, *letourneuxi*, p. 11, El Kef, *id.* Explor. Tunisie ; *T. thessala*, *id.* Ann. Ent. Soc. Fr. 1885, p. 210 ; *T. catula*, *id.* Bull. Soc. Zool. x. p. 22, pl. x. fig. 4 ; *T. nidicola*, p. 482, pl. xlvi. fig. 1, New England, *pratensis*, p. 483, fig. 4, and *polita*, fig. 2, Massachusetts, Connecticut, *frondicola*, p. 484, fig. 3, *pictilis*, p. 485, fig. 5, Mount Washington, *vulpina*, p. 487, pl. xlvii. fig. 2, *nigraventris*!, p. 488, fig. 5, Essex, *communis*, p. 489, fig. 6, Massachusetts, Rhode I., Connecticut, Emerton, *t. c.*

Trochosa dybowskii, Kulczynski, *t. c.* p. 54, pl. xi. fig. 32, Kamtschatka.

Argyronetidæ.

Mitrofanof, —. Zur Anatomie der *Argyroneta aquatica*. Nachr. Ges. Freunde naturwissensch. Moskau, xxxvii. p. 190 *et seq.*

Agalenidæ.

Phyllœca, g. n. (an recte hujus familiæ?), for *P. marginata*, Dahl, Schr. Nat. Ver. Schleswig, v. p. 61, pl. i. figs. 11 & 12, pl. ii. fig. 34, Black Forest, on leaves.

Cybæolus, g. n., allied to *Cybæus*, for *C. pusillus*, Simon, Bull. Soc. Zool. 1884, p. 9 (sep.), Ile Hoste.

Emmenomma, g. n., for *E. oculatum*, *id. t. c.* p. 10, pl. iii. figs. 8–11, Ile Hoste, Ile Hermite, common.

Agalena leucopyga, sp. n., Pavesi, Ann. Mus. Genov. xx. p. 41, Mahal-Uonz, Let-Marefia.

Celotes subfasciatus, p. 7, Ile Hermite, *castaneifrons*, p. 8, Ile Hoste, spp. nn., Simon, *t. c.*

Hadites myops, sp. n., *id.* Ann. Soc. Ent. Fr. 1885, p. 212.

Hahniidæ.

Hahnia rupicola, sp. n., *id.* An. Soc. Esp. xiii. p. 120, Miranda-de-Ebro.

Amaurobiidæ.

Amaurobius dentichelis, sp. n., *id.* Ann. Soc. Ent. Fr. 1883, p. 268, pl. viii. figs. 3 & 4 ; *A. fuegianus*, sp. n., *id.* Bull. Soc. Zool. 1884, p. 12

[illegible] figs. 12 & 13, Terra del Fuego; *A. nevadensis*, *severus*, [illegible]*cius*, spp. nn., Nevada and Washington Territory, *id. ibid.*

Mezentia macilenta, sp. n., *id. op. cit.* 1885, p. 16, pl. x. fig. 17, Kinta Valley.

Eresidæ.

The young males of *Eresus cinnabarinus* are uniformly black, like the females; Bertkau, Verh. Ver. Rheinl. 1883, p. 213.

Stegodyphus mimosarum, sp. n., Pavesi, Ann. Mus. Genov. xx. p. 81, Daimbi.

Uloboridæ.

Emerton, H. J. The Cobwebs of *Uloborus*. Am. J. Sci. (3) xxv. pp. 203–205, 2 woodcuts.

Uloborus niloticus, sp. n., Simon, Bull. Soc. Zool. 1884, p. 20, Khartoum.

Dictynidæ.

Bertkau, P. Ueber die Gattung *Argenna* (Thor.) und einige andere Dictyniden. Arch. f. Nat. xlix. p. 374–382, pl. xi.

The genus *Argenna* (Thor.) belongs to the *Dictynidæ*, with the species *A. mengei* (Thor.), *pallida* (L. Koch), (*Dictyna*) *albopunctata* (Menge), (*Lethia*) *albospiraculis* (Cambr.), and *A. testacea*, sp. n., p. 388, figs. 1, 2, 4, & 5, Rheinbrohl. The author makes also some observations on the recept. seminis of *Dictyna viridissima*.

Lathys, n. n. for *Lethia* (Menge), preocc.; *Altella*, n. n. for *Amphissa* (Cambr.), preocc.; *Devade*, n. n. for *Diotima* (Sim.), preocc.; *Scotolathys*, g. n., allied to *Lathys*, for *S. simplex*, sp. n., from Oran; *Chærea*, g. n., allied to *Dictyna*, for *C. maritimus*, from Nemours, near Oran, Carthagena: Simon, Bull. Soc. Zool. ix. pp. 321–327.

Dictyna crassipalpis, sp. n., Dahl, *t. c.* p. 54, pl. ii. fig. 31; *D. vittata*, p. 663, pl. xxi. fig. 12 [*D. volupis* (Keys.) redescribed and figured, p. 664, fig. 13], *arundinaceoides*, p. 665, fig. 14, Canon City, Col., spp nn., Keyserling, Verh. z.-b. Wien, xxxiii.; *D. cognata*, sp. n., Cambridge, Ann. N. H. (5) xv. p. 237, pl. ix. fig. 1, Netherlands; *D. olivacea*, from La Goulette, and *frutetorum*, from Draham, p. 32, *palmarum*, from Gabès, p. 33, spp. nn., Simon, Explor. Tunisie.

Micryphantidæ.

Bertkau, in Verh. Ver. Rheinl. pp. 226 *et seq.*, includes in this family the species of *Erigone*, *Neriene*, and *Walckenaera*, with highly-developed tracheæ; there are excluded *Erigone livida*, *clarkii*, *rufa*, *capucina*, *pabulatrix*, *silvatica*, *thoracica*, *hardii*, with simple tracheæ, which are placed with the *Theridiidæ*. The following new genera are proposed:—

Œdothorax, g. n., for *O. gibbosus* (Cambridge).

Stylothorax, g. n., for *S. apicatus* (Blackw.).

Ithyomma, g. n., for *I. cucullatum* (C. L. Koch).

Diplocephalus, g. n., for *D. foraminifer* (Cambr.).

Simon, in the Arachn. de France, v. pt. 3, treats on this [illegible] contains the groups *Lophocarenini*, *Walckenaerini*, *Masonini*, [illegible] There are described many new genera and species :—(gr. *Lophocarenini*; sg. *Gonatiini*) *Donacochara*, g. n., for *D. speciosa* (Thor.) p. 461; *Hylyphantes*, g. n., for *H. nigritus* (Sim.), p. 463; *Trichoncus*, g. n., for *T. scrofa*, Cantal, p. 467, *sordidus*, Bouches-du-Rhône, p. 468, *aurantiipes*, Algier, p. 469, spp. nn.; *Gongylidium* (with *rufipes*, *graminicola*, *fuscum*, *retusum*, *cristatum* = *perforatum*, *apicatum*, *gibbosum*, *tuberosum*, *dentatum*, *agreste*) *cantalicum*, p. 480, Cantal, *tingitanum*, p. 483, Tanger, *piscator*, p. 484, Mariyuma, *longipes*, p. 496, Wallis, *distinctum*, p. 497, Aisne, *foenarium*, p. 498, Alpes Maritimes, *barbarum*, p. 500, Algier, *pirata*, p. 501, Algier, spp. nn.; *Scotinotylus*, g. n., p. 501, for *antennatus* (Cbr.), = *aries* (Kulcz.), and *alpigena* (L. Koch); *Tiro*, g. n., p. 506, for *T. vagans* (Blackw.) and *T. morosus*, sp. n., p. 509, Alpes Maritimes; *Stajus*, g. n., p. 510, for *truncatifrons* (Cbr.); *Erigone* (including *E. longipalpis*, Sundev., *remota*, L. Koch, *dentipalpis*, Wid., *promiscua*, Cbr., *atra*, Blackw., *vagans*, Aud., = *spinosa*, Cbr., *litoralis*, L. Koch) *meridionalis*, p. 517, Aude, *lantosquensis*, p. 520, S. Marie-Lantosque, *jugorum*, p. 521, Hautes-Pyrénées, *tenuimanus*, p. 522, Basses-Alpes, *cristatopalpus*, p. 523, Hautes Alpes, *capra*, p. 529, Isère, spp. nn.; [*Lophomma* (Menge) contains the species *punctatum*, Blackw., *herbigrada*, Blackw., *laudatum*, Cbr., *stativum*, Sim.; *Dicymbium* (Menge) *tibiale*, Blackw., *nigrum*, Blackw.:] *Gonatium* (*nemorivaga*, Cbr., *corallipes*, Cbr., *rubens*, Blackw., *rubellum*, Blackw., *ensipotens*, Sim., *bituberculatum*, Wid., *cornutum*, Blackw.) *bi impressum*, p. 551, Sardinia, *dayense*, p. 553, Oran, spp. nn.; *Dismodicus*, g. n., for *bifrons*, Blackw., *elevatus*, C. L. Koch; *Prosoponcus*, g. n. (= *Diplocephalus*, p. 874, *vide supra*) for *P. cristatus*, Blackw., *foraminifer*, Cambr., *frontatus*, Blackw., and the spp. nn., *P. culminicola*, p. 875, Hautes-Pyrénées, *rectiloba*, p. 573, Digne, *thyrsiger*, p. 514, Basses-Pyrénées, *bicephalus*, Pyrénées-Orient., and *crassiloba*, Alpes-Maritimes, p. 575; *Trachelocamptus*, g. n., p. 577, for *T. nasutus* (Cbr.), and *bedeli*, sp. n., p. 580, Algier; *Thaumatoncus*, g. n., p. 580, for *indicator*, p. 581, Hérault, *mystacinus*, *lancearius*, p. 582, Oran, spp. nn.; *Typhlochrestus*, g. n., p. 583, for *digitatus* (Cbr.), *dorsuosus* (Cbr.), *petutus* (Cbr.), and *parvicornis*, Egypt, and *bifurcatus*, p. 588, *convexus*, p. 589, Algier, spp. nn.; *Caracladus*, g. n., p. 589, for *aviculus* (L. Koch); *Dactylopisthes*, g. n., p. 592, for *pauper* (Sim.), *digiticeps* (Sim.); *Grammonota* (*gradata*, Sim., and) *letourneuxi*, sp. n., p. 599, Assuan; *Gongylidiellum*, g. n., p. 600, for *latebricola*, Cbr., *vivum*, Cbr., and *G. paganum*, p. 602, Cantal, *placidum*, p. 603, Cantal, *blandum*, p. 604, *calcariferum*, p. 606, Seine-et-Oise, *mediocre*, p. 607, Isère, *nurcidum*, p. 608, Seine, Aube, &c., *arctatum*, p. 611, Algier, spp. nn., (Subg. *Lophocarenini*, s. str.) *Nematogmus*, g. n., p. 614, for *sanguinolentus* (Walck.), = *Simonii* (Cbr.); *Entelecara*, g. n., p. 617, for *E. acuminata* (Wid.), *flavipes* (Blackw.), *erythropus* (Westr.), *nuncia* (Sim.), *thorellii* (Westr.), *trifrons* (Cbr.), and *galerita*, sp. n., p. 630, Aube; *Araeoncus*, g. n., p. 631, for *vaporariorum* (Cbr.), *longiusculus* (Cbr.), *humilis* (Blackw.), *crassiceps* (Westr.), *discedens* (Sim.), *anguineus* (L. Koch), and *altissimus*, sp. n., p. 640, Pyrén.-Orient.; *Notioscopus*, g. n., p. 643, for *sarcinatus* (Cbr.); *Troxocharus*,

[illegible] for *scabriculus* (Westr.), *hiemalis* (Blackw.), *ignobilis* [illegible]) ; *Abacopreces*, g. n., p. 653, for *saltuum* (L. Koch) ; *Lophocarenum* (*inditum*, Cbr., *parumpunctatum*, Sim., *parallelum*, Wid., *elongatum*, Wid., *thoracatum*, Cbr., *medusa*, Sim., *cucurbitinum*, Sim., *rufithorax*, Sim., *blackwalli*, Cbr., *stramineum*, Menge, *nemorale*, Blackw., and) *insanum*, p. 666, Alpes-Marit., *nivicola*, p. 671, Hautes-Pyrén., *mengei*, p. 677, Seine-Inf., *capitatum*, p. 682, Alpes-Marit., *nicaœnse*, p. 683, Nizza, *eminulum*, Vallombrosa, and *amabile*, Algier, p. 684, *oranense*, p. 685, Oran, spp. nn. ; *Peponocranium*, g. n., p. 685, for *P. ludicrum* (Cbr.) ; *Exechophysis*, g. n., for *bucephalus* (Cbr.), and *leonina*, *suilla*, from Algier, *proclivis*, Roma, p. 693, spp. nn. ; *Baryphyma*, g. n., p. 694, for *B. schlicki*, p. 695, Aisne ; *Delorrhipis*, g. n., p. 696, for *D. fronticornis*, p. 697, Pyrén.-Orient. ; *Cnephalocotes*, g. n., for *obscurus* (Blackw.), *elegans* (Cbr.), *curtus* (Sim.), *pusillus* (Menge), and *crassirostris*, sp. n., p. 707, Nimes ; *Hybocoptus*, g. n., p. 708, for *corrugis* (Cbr.), *decollatus* (Sim.), *cricicola* (Sim.) ; *Pocadicnemis*, g. n., for *pumila* (Blackw.), and *prominens*, sp. n., p. 716, Seine-et-Oise ; *Metopobactrus*, g. n., p. 718, for *rayi* (Sim.), *verticalis* (Sim.), *prominulus* (Cbr.), and *falcifrons*, sp. n., p. 719, Pyrén.-Orient. ; *Erigonoplus*, g. n., p. 724, for *inclarus* (Sim.), *nigrocæruleus* (Sim.), *globipes* (L. Koch), *turriger* (Sim.), *justus* (Cbr.), and *nigerrimus*, sp. n., p. 727, Corsica ; *Stylotector*, g. n., p. 733, for *penicillatus* (Westr.), *broccha* (L. Koch), and *inuncans*, sp. n., p. 736, Seine ; *Acartauchenius*, g. n., p. 740, for *scurrilis* (Cbr.), and *depressifrons*, sp. n., p. 743, Basses-Pyrén. ; *Thyreosthenius*, g. n., pp. 744 & 876, for *biovatus* (Cbr.), and *pecuarius*, sp. n., p. 745, Pyrén.-Orient. ; *Pl*[*a*]*esicrœrus*, g. n., p. 745, for *eborodunensis* (Cbr.), *helleri* (L. Koch), *permixtus* (Cbr.), *protuberans* (Cbr.), *lusiscus* (Sim.), *alpinus* (Cbr.), *latifrons* (Cbr.), *becki* (Cbr.), *fuscipes* (Blackw.), *kochi* (Lebert), *picinus* (Blackw.), *insectus* (L. Koch), *biscissus* (Cambr.), and *longicarpus*, p. 749, Alpes-Marit., *procer*, p. 751, var. *opacithorax*, p. 764, Tokai, *castaneipes*, p. 768, Ardèche, *corsicus*, p. 773, C., *cirtensis*, p. 777, Constantine, spp. nn. ; *Tapinocybe*, g. n., p. 778, for *præcox* (Cbr.), *pallens* (Cbr.), *subitanea* (Cbr.), *cyclops* (Sim.), and *parisiensis*, p. 784, Fontenay-aux-Roses, sp. n. ; *Minyriolus*, g. n., p. 787, for *pusillus* (Wid.), *servulus* (Sim.) ; *Panamomops*, g. n., p. 792, for *diceros* (Cbr.), *bicuspis* (Cbr.), *tauricornis* (Sim.) ; (Gr. *Walckenaerini*) *Wideria* (for *cucullata*, C. L. Koch, *polita*, Sim., *melanocephalus*, Cbr., *antica*, Wid., *stylifrons*, Cbr., *fugax*, Cbr., and) *angustifrons*, sp. n., p. 811, Gironde ; *Walckenaera* (for *obtusa*, Blackw., *nudipalpis*, Westr., *acuminata*, Blackw., *capito*, Westr., *mitrata*, Menge, *jucundissima*, Cbr., and) *lugens*, sp. n., p. 822, Aube, also in Nassau, near, Limburg ; *Prosopotheca*, g. n., p. 829, for *incisa* (Cbr.), *corniculans* (Cbr.), *monoceros* (Wid.), and *erythrina*, sp. n., p. 837, Corsica ; *Tigellinus*, g. n. p. 838, for *furcillatus* (Menge), *saxicola* (Cbr.) ; *Cornicularia*, Menge, for p. [illegible]*idata*, Blackw., *unicornis*, Cbr., *vigilax*, Blackw.). (Gr. *Cinetini*) [illegible]*tinella*, Emert., for *scabrosa*, Cbr., *brevis*, Wid., *wideri*, Thor., *brein c*[illegible] Westr.) ; *Cineta*, g. n., p. 859, for *geniste* (Sim.) ; (Gr. *Masonini*) *Po*[illegible] g. n., p. 861, for *sundevallii* (Westr.), *westringi* (Sim.) ; (*Minicia*, *pygmæ*[illegible] or *marginella*, Wid., = *nigrolimbata*, Cbr.;) *Tuberta*, g. n., p. 869, *cavicol*[illegible]*gnipalpis*, sp. n., p. 869, Sos.

Van Hasselt. Overzicht von de *Micryphantidæ* of *Erigonina?*[illegible] Ent. xxviii. Versl. pp. 89–95.

Lophomma vittatum (Bertkau) = *Erigone nigro-limbata* (Cbr.) (= *Minicia marginella, vide suprà*); Bertkau, Verh. Ver. Rheinl. 1883, p. 215.

Lophocarenum fallaciosum, sp. n., *id. t. c.* p. 229, fig. 2, Aix-la-Chapelle.

Cornicularia lepida, sp. n., Kulczynski, Aran. Camtsch. p. 39, pl. x. fig. 8, Kamtschatka.

Erigonoplus krueperi, sp. n., Simon, Ann. Soc. Ent. Fr. 1884, p. 335, Attica.

Erigone mœbi, p. 47, fig. 33, Berlin, *henkingi*, p. 49, figs. 29 & 30, Berlin, *commutabilis*, p. 50, fig. 32, Dahme, spp. nn., Dahl, Schr. Nat. Ver. Schleswig, v. pl. ii.; *E. antarctica*, sp. n., Simon, Bull. Soc. Zool. ix. p. 6 (sep.), pl. iii. fig. 7, Ile Hoste; *E. aliena*, p. 40, pl. x. fig. 19 (gen. *Ceratinopsis* of Emerton ?), *camtschadalica*, p. 41, pl. xi. fig. 20, spp. nn., Kulczynski, Aran. Camtsch., Kamtschatka.

Gonatium convexum, sp. n., *id. t. c.* p. 38, pl. x. fig. 11, Kamtschatka.

Gongylidium suppositum, p. 36, fig. 15, *vile*, p. 37, fig. 16, spp. nn., from Kamtschatka, *id. t. c.*

Walckenaera hasseltii, p. 89, fig. 1, and *nemoralioides* !, p. 91, fig. 2, spp. nn., Cambridge, Ann. N. H. (5) xiv. pl. iv., Netherlands.

Pholcidæ.

Pholcus hieroglyphicus, sp. n., Pavesi, Ann. Mus. Genov. xx. p. 37, Let-Marefia.

Zodariidæ (= Envoidæ).

Zodarium frenatum, sp. n., Simon, Ann. Soc. Ent. Fr. 1884, p. 336, Naxos.

Selamia histrionica, sp. n., *id.* Bull. Soc. Zool. ix., Oran, Nemours, Daya; *S. segmentata*, sp. n., *id.* Explor. Tunisie, p. 29, Kerouan.

Filistatidæ.

Filistata condita (Cambr.). Adult male described and figured by Simon, Ann. Soc. Ent. Fr. 1883, p. 278, pl. viii. fig. 11. The species, for the first time recorded from St. Helena, also occurs in Ponta Delgada.

Theridiidæ.

Bertkau, Verh. Ver. Rheinl. 1883, pp. 216–249, restricts this family to the species with 4 simple tracheal tubes, thus including *Walckenaera hary-* and *Pholcomma gibbum* (Westr.). *Neriene livida* (Blackw.), *clarkii* (C. *rum* *truncorum* (L. Koch), have no tracheæ at all. The author adopts for *Pyrén.-* the name *Ctenium*, proposed by Menge. *charus*,

...g, in vol. ii. of his Spinnen Amerikas, treats on a portion of ...his family, describing and figuring *Theridium* 63, *Centropelma* 1, *Gaucelmus* 1, *Achæa* 9, *Steatoda* 3, *Teutana* 3, *Lithyphantes* 10, *Lathrodectus* 2, *Chrysso* 4, *Hildbolda* 1, *Faiditus* 2, *Thymoites* 1, *Thwaitesia* 2, *Ariamnes* 3, *Helvibis* 2, *Spintharus* 2, *Arygrodes* 15, *Episinus* 3, *Audifia* 1, *Coleosoma* 1, *Formicinoides* 2, *Bellinda* 1, *Theridiosoma*, 4 spp. The European *Theridium tepidariorum*, *Steatoda bipunctata*, *Teutana triangulosa*, *Lithyphantes corollatus*, *Episinus truncatus* (?) also occur in America.

Simon, in his Arachnides de France, v. pts. 2 & 3, p. 181 *et seq.*, continues this family, treating of his 6th section, *Erigonini*, to which belong 6 groups : *Enoplognathini* (gen. *Enoplognatha*, *Pedanostethus* = *Ctenium*, preocc.), *Linyph(i)ini* (gen. *Tapinopa*, *Bolyphantes*, *Drapetisca*, *Linyphia*, *Leptyphantes*, *Bathyphantes*, *Tmeticus*, *Microneta*, and several new ones), *Lophocarenini*, *Walckenaerini*, *Cinetini*, *Masonini*; the four latter of which are placed by Bertkau in the family *Micryphantidæ* (*vide suprà*). The males of the *Enoplognathini* are stridulating, the stridulating apparatus in *Pedanostethus* being in a rudimentary condition.

Keyserling (*t. c.*) describes :—

Gaucelmus, g. n., allied to *Nesticus*, for *G. augustinus*, sp. n., p. 99, pl. v. fig. 65, Florida, in the cellars of the Fort Augustin.

Hildbolda, g. n., allied to *Euryopis* and *Dipoena*, for *H. simoni*, sp. n., p. 157, pl. vii. fig. 97.

Faiditus, g. n., for *F. rubrovittatus*, p. 159, pl. vii. fig. 98, locality not given, and *ecaudatus*, p. 160, fig. 99, Uassa, spp. nn.

Thymoites, g. n., allied to *Teutana*, for *Th. crassipes*, sp. n., p. 162, pl. vii. fig. 100, Pumamarca, Peru.

Helvibis, g. n., p. 172, for *H. thorellii*, p. 173, pl. viii. fig. 105, Peru, Amazonas, and *H. sulcata*, p. 175, fig. 106, Amazonas, spp. nn.

Audifia, g. n., p. 209, for *A. lævithorax*, sp. n., p. 210, pl. x. fig. 126, Para.

Formicinoides, g. n., resembling *Formicina*, for *F. brasiliana*, p. 214, pl. x. fig. 128, Amazonas, and *chilensis*, p. 215, fig. 129, Chili, spp. nn.

Bellinda (!), g. n. for (*Theridium*) *cancellata* (Hentz), p. 216.

Simon (*t. c.*) describes :—

Frontina, g. n., *Linyphiin.*, p. 206, for *bucculenta* (L.) = *frenata* (aut.).

Taranucnus, g. n., p. 248, for *T. furcifer*, p. 250, Basques, *cerberus*, p. 252, Basses-Pyrén., *orpheus*, p. 253, Aude, in caves, *phragmitis*, p. 255, Basses-Pyrén., *marqueti*, p. 256, Ariège, in caves, *lucifuga*, p. 260, Wallis, spp. nn.

Labulia, g. n., p. 261, for *L. thoracica* (Wid.) and *rupicola*, sp. n., p. 264, Alp. marit.

Cryptocleptes, g. n., for *C. paradoxus*, sp. n., p. 352, Ardèche, in caves.

Porrhomma, g. n., pp. 353 & 873, for *P. proserpina*, *decens*, *errans*, *pygmæum*, *glaciale*, *montigena*, *adipatum*, *formidabile*, and the new species *cavicola*, p. 355, Spain, *egeria*, p. 357, Aisne, *myops*, p. 358, Aude, *subter-*

raneum, p. 359, Lantaret, *scopiferum*, p. 361, Pyrén.-Orient., p. 362, Gers.

Opist[*h*]*oxys*, g. n., p. 372, for *O. acuta*, sp. n., p. 373, Aisne.

Hilaira, g. n., p. 274, for *H. excisa*, *uncata*.

Sintula, g. n., p. 442, for *corniger* (Blackw.), *dilutus* and *aërius* (Cbr.), and *longulus*, p. 447, Alpes-Maritimes, *balteatus*, p. 448, Seine-et-Oise, Aube, Aix, *pusio*, p. 450, Somme, *succinus*, p. 451, Seine-et-Marne, Wallis, spp. nn.

Syedra, g. n., p. 453, for *S. nigrotibialis*, p. 454, Corsica, *ophthalmica*, p. 455, Isère, spp. nn.

Phaulothrix, n. n. for *Leptothrix* (Menge), preocc.; Bertkau, *t. c.* p. 216.

Achæa undata, p. 105, pl. v. fig. 68, Amazonas, *compressa*, p. 107, fig. 69, Amable Maria, *altiventer*, p. 108, fig. 70, S. America, *dromedaria*, p. 109, fig. 71, *guadelupensis*, p. 110, fig. 72, *ignota*, p. 112, fig. 73, Cayenne, Minas Geraes, *acutiventer*, p. 113, fig. 74, Peru, spp. nn., Keyserling, *t. c.*

Argyrodes vittatus, p. 191, pl. ix. fig. 114, Sa. Fé de Bogotá, Peru, *montanus*, p. 193, fig. 115, Peru, *obscurus*, p. 194, fig. 116, Peru, *larvatus*, p. 197, fig. 118, Columbus, Texas, *spinosus*, p. 201, fig. 121, Amable Maria, *globosus*, p. 204, pl. x. fig. 123, Crescent City, Florida, spp. nn., *id. t. c.*

Ariamnes delicatulus, sp. n., Simon, Ann. Soc. Ent. Fr. 1883, p. 272, pl. viii. fig. 5, Sao Miguel; *A. spinicaudatus*, sp. n., Keyserling, *t. c.* p. 171, pl. viii. fig. 104.

Bathyphantes mastodon, p. 332, *burgundicus*, p. 347, Aube, Yonne, *vittiger*, p. 350, Hautes-Alpes, Pyrén.-Orient., Simon, Arachn. de France, v.; *B. major*, p. 30, fig. 11, *pogonias*, p. 32, fig. 12, *anceps*, p. 33, fig. 13, and *fucatus*, p. 35, fig. 14, from Kamtschatka, Kulczynski, Aran. Camtsch. pls. ix. & x.; spp. nn.

Bolyphantes nigropictus, sp. n., Simon, *t. c.* p. 214, Hautes-Alpes, Corsica.

Chrysso nigriceps, p. 154, pl. vii. fig. 95, Sa. Fé de Bogotá, *vexabilis*, p. 155, fig. 96, New Granada, spp. nn., Keyserling, *t. c.*

Crustulina nitida, sp. n., Simon, Ann. Soc. Ent. Fr. 1884, p. 331, Athens.

Drepanodus (= *Enoplognatha*) *corollatus*, sp. n., Bertkau, *t. c.* p. 246, Ingelheim.

Enoplognatha maritima, p. 189, pl. xxv. fig. 10, Saint-Valéry, Morbihan, on *Salsola* and *Atriplex portulaccoides*, *testacea*, p. 192, Gironde, Corsica, *nigrocincta*, p. 193, Giroude, Corsica, Simon, Arachn. de Fr. v.; *E. robusta*, p. 332, Eubœa, *quadripunctata*, p. 333, Eubœa, Athens, Algiers, *id.* Ann. Soc. Ent. Fr. 1884; *E. camtschadalica*, p. 28, pl. ix. fig. 9, Kulczynski, *t. c.*: spp. nn.

Episinus brasilianus, p. 206, pl. x. fig. 124, Brazil, *longipes*, p. 207, fig. 125, Peru, spp. nn., Keyserling, *t. c.*

Formicina eleonoræ, sp. n., Costa, Rend. Acc. Nap. xxi., Sardinia.

Lasæola testaceo-marginata (Sim.) var. n. *oceanica*, Simon, Ann. Soc. Ent. Fr. 1883, p. 272, pl. viii. fig. 5, Sao Miguel; *L. sedilloti*, p. 25, *leveillei*, p. 26, from Ain-Draham, spp. nn., *id.* Explor. Tunisie; *L. bodjoensis*, sp. n., *id.* CR. ent. Belg. 1885, p. 39, Bodjo.

[L]yphantes nodifer, p. 282, Isère, *culminicola*, p. 283, Hautes-Alpes, *euchirus*, p. 284, Somme, *hamifer*, p. 285, Var, *monachus*, p. 286, Digne, *striatus*, p. 291, Isère, *ignavus*, p. 294, Isère, *frigidus*, p. 295, Hautes-Alpes, *gladiola*, p. 298, Hautes-Alpes, Corsica, *bidens*, p. 299, Seine-et Oise, *culicinus*, p. 302, Somme, *longiseta*, p. 304, Corsica, *angustiformis*, p. 305, Corsica, Sardinia, *alutacius*, p. 309, Seine-et-Oise, Aube, *monodon*, p. 310, Côte-d'Or, Isère, *stygius*, p. 311, Biscaya, *pinicola*, p. 312, Gironde, Isère, *cernuus*, p. 315, Corsica, *parallelogrammus*, p. 315, Pyrén.-Orient., *zonatus*, p. 322, Hérault, *herbicola*, p. 323, Var, *pellucidus*, p. 325, *midas*, p. 327, Seine-et-Marne, *prodigialis*, p. 328, Corsica, Simon, Arachn. de Fr. v.; *L. bipilis*, Kulczynski, Aran. Camtsch. p. 29, pl. ix. fig. 10, Kamtschatka : spp. nn.

Linyphia calypso, sp. n., Bertkau, *t. c.* p. 256, fig. 7, near Bonn; *L. clairi*, sp. n., Simon, *t. c.* p. 235, Alpes Maritimes; *L. mimonti*, sp. n., *id.* Ann. Soc. Ent. Fr. 1884, p. 334, Eubœa; *L. lineola*, p. 28, *suspiciosa*, p. 30, *sterilis*, p. 31, spp. nn., from Scioa, Pavesi, Ann. Mus. Genov. xx.; *L. viridis*, sp. n., Karsch, SB. Ges. Marb. 1884, p. 64, fig. 5, S. Thomé, Rolas.

Lithyphantes andinus, p. 132, pl. vi. fig. 82, Peru, *vittatus*, p. 134, fig. 83, Minas Geraes, *pulcher*, p. 137, fig. 85, Washington Territ., *tectus*, p. 138, fig. 86, Colorado, *nigrofemoratus*, p. 139, fig. 87, Peru, *septemmaculatus*, p. 141, fig. 88, Florida, *fulvus*, p. 142, fig. 89, Utah, *janinensis*, p. 143, fig. 90, Peru, spp. nn., Keyserling, *t. c.*; *L. morsitans*, sp. n., Cambridge, Ann. N. H. (5) xvi. p. 237, pl. ix. fig. 2, Swaziland, Africa.

Microneta rustica, p. 430, Nurmberg, *simplicitarsis*, p. 435, Seine-et-Oise, *nigripes*, p. 439, Wallis, spp. nn., Simon, Arachn. de Fr. v.

Spintharus elongatus, sp. n., Keyserling, *t. c.* p. 178, pl. viii. fig. 108, Peru.

Steatoda brasiliana, sp. n., *id. t. c.* p. 115, pl. v. fig. 75, Rio de Janeiro; *S. molesta*, p. 34, Let-Marefia, and *lineiventris*, p. 461, Tunis, spp. nn., Pavesi, Ann. Mus. Genov. xx.

Tapinopa disjugata, sp. n., Simon, *t. c.* p. 205, Corsica.

Teutana zonata, sp. n., Keyserling, *t. c.* p. 127, pl. vii. fig. 80, Mexico.

Theridium crebennum, sp. n., Bertkau, *t. c.* p. 243, fig. 5, Valley of the Rhine, near Bonn; *Th.*, 46 spp. nn., Keyserling, *t. c.* pp. 12–96, figs. 2–63; *T. fornicatum*, p. 22, *vossioni*, p. 23, *abruptum*, p. 24 (sep.), spp. nn., from Khartoum, Simon, Bull. Soc. Zool. 1884; *T. perpusillum*, sp. n., *id. op. cit.* 1885, p. 16 (sep.), Kinta Valley; *T. impressum* (L. Koch) var. n. *intermedium*, Kulczynski, Aran. Camtsch., p. 27, Kamtschatka.

Theridiosoma argentata, p. 218, pl. x. fig. 132, Georgia, *concolor*, p. 219, fig. 133, Amazonas, spp. nn., Keyserling, *t. c.*

Tmeticus dentichelis, p. 390, Var, *sellarius*, p. 394, Biscaya, *levitarsis*, p. 395, Aisne, *electus*, p. 396, Tarn-et-Garonne, *capucinus*, p. 398, Aube, *encifer* (!), p. 400, Hautes-Alpes, *sinus*, p. 405, Cantal, *delphinicusis*, p. 406, Isère, *timidus*, p. 407, Spain, *cinctus*, p. 414, Corsica, *illibatus*, p. 416, Corsica, *probrosus*, p. 418, Seine-et-Oise, *satyrus*, p. 419, Seine-et-Marne, spp. nn., Simon, Arachn. de Fr. v.

Thwaitesia adamantifera, p. 164, pl. vii. fig. 101, Peru, Brazil, *splendida*, p. 166, pl. viii. fig. 102, New Granada, spp. nn., Keyserling, *t. c.*

Archæidæ.

Simon, Ann. Mus. Genov. xx. pp. 182–187, with 5 woodcuts, includes in this family the (fossil) genus *Archæa* (C. L. Koch) and *Eriauchenus* (Cbr.), and the new one, *Landana*, for *L. petiti*, sp. n., Congo. The family seems to be intermediate to the "*Theridionidæ*" and the "*Epeiridæ* de la sous-famille *Tetragnathinæ*."

*Mecysmaucheniu*s, g. n., for *M. segmentatus*, sp. n., *id. t. c.* p. 379, Ile Hoste & Ile Hermite.

Archæa pougneti, sp. n., fossil, amber, *id.* p. 376.

Pachygnathidæ.

Pachygnatha brevis (= *tristriata*, Keys., *nec* C. L. Koch), p. 658, *autumnalis*, p. 660, fig. 10, Pennsylvania, *furcillata*, p. 662, fig. 11, Philadelphia, spp. nn., Keyserling, Verh. z.-b. Wien, xxxiii.

Tetragnatha vermiformis, p. 333, pl. xxxix. figs. 12–14, Massachusetts, *straminea*, p. 335, figs. 15, 17, 20, & 21, Massachusetts, Connecticut, *caudata*, p. 335, figs. 16 & 22, Massachusetts, spp. nn., Emerton, Tr. Conn. Ac. vii.

Epeiridæ.

Emerton, —. New England *Epeiridæ*. Tr. Conn. Ac. vii. pp. 295–342, pls. xxxiii.–xl.

The author removes *Hyptiotes* and *Uloborus* from this family, which he divides into the subf. *Epeiridæ* (gen. *Singa*, *Zilla*, *Microepeira*, *Cyclosa*, *Acrosoma*, *Cyrtarachne*, *Argiope*, *Argyroepeira*) and *Tetragnathinæ* (gen. *Tetragnatha*, *Pachygnatha*). There are described and figured 61 spp. For *E. radiosa* (McCook) is established the g. n. *Microepeira*, p. 320, and for *E. hortorum* (Hentz) the g. n. *Argyroepeira*, p. 331.

Bertrana, g. n., spines on the legs wanting, for *B. striolata*, sp. n., Keyserling, Verh. z.-b. Wien, xxxiii. p. 654, pl. xxi. figs. 8–11, Pevas, Amazonas.

Epeiroides, g. n., allied to *Epeira*, for *E. bahiensis*, sp. n., *id. op. cit.* xxxiv. p. 524, pl. xiii. fig. 23, Bahia.

Glyptogona, g. n., for *G.* (*Epeira*) *sextuberculata* (Keys.), Simon, Ann. Soc. Ent. Fr. 1884, p. 326.

E. Simon, Bull. Soc. Zool. x. p. 35 (sep.) tabulates the genera *Gasteracantha*, *Stanneoclavis*, *Actinacantha*, and *Isoxya* (= *Isacantha*, preocc.). The types are *Gasteracantha fornicata* (F.), *Stanneoclavis brevispina* (Dolesch.), *Actinacantha lepelletieri* (Guér.), *Isoxya cicatricosa* (C. L. Koch).

Acrosoma peregrinatorum, sp. n., Holmberg, An. Soc. Arg. xv. p. 232, Formosa, Chaco (Argent.).

Argiope arcuata, sp. n., Simon, Ann. Mus. Genov. xx. p. 343, Burmah.

Cyclosa algerica, sp. n., *id.* Explor. Tunisie, p. 21, Feriana.

Cyrtarachne bisaccata, sp. n., Emerton, *t. c.* p. 325, pl. xxxiv. fig. 11, & pl. xxxviii. fig. 12 (egg-sac), New Haven.

californiensis, sp. n., Keyserling, Verh. z.-b. Wien, 1884, p. 525, pl. xiii. fig. 24, California.

Epeira worckmanni, p. 649, fig. 1, *lucida*, p. 650, fig. 2, *albiventer*, p. 651, fig. 3, all from Brazil, spp. nn., *id. op. cit.* 1883, pl. xxi. ; *E. volucripes*, p. 528, fig. 27, Panama, Haiti, *sexpunctata*, p. 530, fig. 28, N. America, *alba*, p. 531, fig. 29, *bispinosa*, p. 531, fig. 30, St. Diego, *nicaraguensis*, p. 532, fig. 31, Nicaragua, *id. op. cit.* 1884, pl. xiii. ; *E. solitaria*, p. 299, pl. xxxiii. fig. 11, & pl. xxxv. fig. 3, Massachusetts, *corticaria*, p. 300, pl. xxxiii. fig. 14, & pl. xxxv. fig. 9, Beverley, Adirondak Mts., *silvatica*, p. 300, pl. xxxiii. fig. 13, & pl. xxxv. figs. 1, 4, & 6, *cinerea*, p. 302, pl. xxxiii. fig. 10, & pl. xxxv. figs. 7 & 8, Maine, *juniperi*, p. 313, pl. xxxiv. fig. 6, & pl. xxxvi. figs. 14–16, Portland, *alboventris*, p. 314, pl. xxxiv. fig. 5, & pl. xxxvi. fig. 12, Peabody, Emerton, *t. c.* ; *E. radulans*, p. 11, *chiarinii*, p. 14, and *sulphurina*, p. 16, from Scioa, Pavesi, Ann. Mus. Genov. xx. ; *E. rufofemorata*, Simon, *t. c.* p. 318, Burmah ; *E. hyadesi*, *id.* Bull. Soc. Zool. 1884, p. 5 (sep.), pl. iii. figs. 5 & 6, Ile Hoste, *cerviniventris*, p. 16, and *mimosicola*, p. 17, Khartoum, *id. ibid.* ; *E. ditissima*, *cossoni*, *id.* Explor. Tunisie, pp. 22 & 23, Aïn-Draham, Feriana ; *E. weyersi*, *id.* C.R. ent. Belg. 1885, p. 38, Fort-de-Kock ; *E. aprica*, Karsch, SB. Ges. Marb. 1884, p. 67, fig. 8, Rolas ; *E. proxima*, p. 19, fig. 1, *vicaria*, p. 21, fig. 4, both from Kamtschatka, Kulczynski, Aran. Camtsch., Kamtschatka : spp. nn.

Gasteracantha purpurea, sp. n., Simon, Bull. Soc. Zool. 1884, p. 19, fig. 9, Khartoum ; *G. dahomensis*, sp. n., Karsch, Abh. Ver. Brem. ix. p. 70, Dahome ; *G. formosa* (Vinson) var. *confluxa*, *id.* SB. Ges. Marb. 1884, p. 68, S. Thomé.

Larinia nigrofoliata, sp. n., Keyserling, Verh. z.-b. Wien, xxxiii. p. 653, pl. xxi. fig. 5, Summit Cañon, Utah, *bivittata*, sp. n., *id. op. cit.* xxxiv. p. 526, pl. xiii. fig. 29, Brazil.

Meta longipalpis, p. 79, and *antinorii*, p. 22, spp. nn., from Scioa, Pavesi, Ann. Mus. Genov. xx. ; *M. argentea-nigra* (!), sp. n., Karsch, SB. Ges. Marb. 1884, p. 68 ; *M. stellimicans*, sp. n., Simon, Bull. Soc. Zool. x. p. 14 (sep.), Kinta Valley.

Singa nigripes, sp. n., Keyserling, Verh. z.-b Wien, xxxiii. p. 655, pl. xxi. fig. 7, Florida, Texas ; *S. variabilis*, pl. xxxiv. fig. 16, & pl. xxxvii. figs. 19–21, Maine, Massach., Connect., *pratensis*, pl. xxxiv. fig. 15, & pl. xxxv. figs. 14–17, p. 322, Massach., Connect., *maculata*, pl. xxxvii. fig. 18, p. 323, spp. nn., Emerton, *t. c.* ; *S. grammica*, p. 328, and *attica*, p. 329, from Athens, spp. nn., Simon, Ann. Soc. Ent. Fr. 1884 ; *S. simoniana*, sp. n., Costa, Bull. Ent. Ital. xvii. p. 255, Sardinia ; *S. atra*, sp. n., Kulczynski, Aran. Camtsch. p. 23, pl. ix. fig. 6, Kamtschatka ; *S. concinna*, sp. n., Karsch, SB. Ges. Marb. 1884, p. 66, Rolas.

Zilla aureola, Keyserling, Verh. z.-b. Wien, xxxiii. p. 652, pl. xxi. fig. 4 ; *Z. dispar*, sp. n., Kulczynski, *t. c.* p. 24, fig. 7, Kamtschatka.

THELYPHONIDEA.

On *Koenenia* (g. n.) *mirabilis* (sp. n.) of the "order" of *Microtelifonidi*, see Grassi, Nat. Sicil. iv. pp. 127 & 162, and above, p. 1.

Phrynidæ.

Phrynus sacatieri, sp. n., de Rochebrune, Bull. Soc. Philom. viii. p. 28, Gambia.

Thelyphonidæ.

Thelyphonus insulanus, sp. n., Keyserling, Arachn. Austr. ii. p. 42, pl. iv. fig. 2, Kandavu, Fiji Is.; *T. bohemicus*, sp. n., fossil, strata of Radnitz, near Rakonitz, Bohemia, Kusta, SB. böhm. Ges. 1884, pp. 186 & 401, with 2 pls.

ANTHRACOMARTI (extinct order).

Anthracomartus krejcii, Kusta, *op. cit.* 1883, p. 340, with pl.; *A. minor*, p. 398, fig. 1, *affinis*, p. 399, fig. 2, spp. nn., *id. op. cit.* 1884, from Radnitz. *Brachypyge carbonis* (Woodw.) is an *Anthracomartus*; Scudder, C.R. ent. Belg. 1885, p. 84; *A. trilobitus*, Scudd., woodcut: Scudder, *t. c.*

SCORPIONIDEA.

Lloyd-Morgan, C. Suicide of Scorpions. Nature, xxvii. p. 313.

Experiments were negative. (See also *t. c.* p. 530.)

Thorell, T., & Lindström, G. On a Silurian Scorpion from Gotland. Sv. Ak. Handl. xxi. No. 9, pp. 1–33, with pl.

A Silurian foss. scorpion is named *Palæophonus* (g. n.) *nuncius* (sp. n.), forming the new suborder *Apoxypodes*, fam. *Palæophonoidæ*, which is characterized by the apical tarsi being acute, destitute of claws. The suborder *Dionychopodes* has the apical tarsi cylindrical, with two movable claws. This suborder is divided into the fossil *Anthracoscorpii*, with the families *Cyclophthalmoidæ*, gen. *Cyclophthalmus* (Corda), and *Eoscorpionidæ* (Scudd.), gg *Eoscorpius* and *Centromachus*, and the recent *Neoscorpii*, with the families *Pandinoidæ*, *Bothriuroidæ*, *Buthoidæ*.

Peach, B. N. Ancient Air-breathers. Nature, xxxi. pp. 295, with woodcuts.

Delorme, P. Le *Palæophon[e]us nuncius* et la théorie de l'évolution. Le Nat. 1885, pp. 29 & 36.

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Cyclophthalmus kralupensis [= *C. senior* (Fritsch) from Kralup]; Thorell, *t. c.* p. 77, note 2.

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...nis, g. n. *Jurin.*, for *H. scintilla*, sp. n., Karsch, Abh. Ver. Brem. ix. p. 69, locality unknown.

Butheolus litoralis, sp. n., Pavesi, Bull. Ent. Ital. xvii. p. 197, Assab.

Buthus isselii, sp. n., *id.* Ann. Mus. Genov. xx. p. 96, Ausaba ; *B. arenicola*, sp. n., Simon, Explor. Tunisie, p. 51, Gabès, Tozzer.

Isometrus. 8 species tabulated by Simon, Ann. Mus. Genov. xx. p. 370 ; *I. atomarius*, p. 363, Burmah, *tricarinatus*, Pondicherry, and *mesor* (!), Java p. 371, spp. nn., Simon, *t. c.* ; *I. thorelli*, p. 12, pl. ii. fig. 1, Sydney, Rockhampton, *perfidus*, p. 15, fig. 2, Viti-Levu, spp. nn., Keyserling, *t. c.*

Heterometrus maurus var. n. *berytensis*, Simon, Ann. Soc. Ent. Fr. 1884, p. 192, Beirut.

Hormurus asiaticus, p. 24, pl. iii. fig. 1, India, *karschii* (perhaps = *caudicula* var.), p. 31, fig. 3, New Guinea, spp. nn., Keyserling, *t. c.*

Lychas mabillanus, sp. n., de Rochebrunè, Bull. Soc. Philom. viii. p. 28, Gambia.

Palamnaeus silenus, sp. n. (= *megacephalus*, Sim., *nec* C. L. Koch), Simon, Ann. Mus. Genov. xx. p. 361, Siam, Cochin-China, Assam.

The habitat of *Pandinus setosus* (C. L. Koch) is probably W. Africa ; Karsch, Abh. Ver. Brem. ix. p. 67 *et seq.*

Scorpio lucidipes, sp. n., Simon, Bull. Soc. Zool. x. p. 38, Ramnad.

Cyclophthalmus senior (Corda) from the Coal Measures near Rakonitz, redescribed and figured by Kusta, SB. böhm. Ges. 1884, pp. 48 & 401, fig. 4.

Pseudoscorpiones.

Tömösvary, Ö. Data ad cognitionem Pseudoscorpionum. Term. füzetek, viii. pp. 16–27, pl. i.

(A) *Pseudoscorpiones* faunæ pæninsulæ Balkanicæ : *Chernes cimicoides* (F.), *rufeolus* (E. Sim.), *affinis* (Tömösv.), *Chelifer degeeri* (C. L. Koch), *meridianus* (C. L. Koch), *heteromerus* (C. L. Koch), *cancroides* (L.), *maculatus* (L. Koch), *nodulimanus* (Tömösv.), *danaus* (Tömösv.), *Cheiridium museorum* (Leach), *Olpium pallipes* (Luc.), *semicittatum* (Tömösv.), *dimidiatum* (L. Koch), *græcum* (L. Koch), *hermanni* (Lucas), *Garypus litoralis* (L. Koch), *minor* (L. Koch), *Roncus lubricus* (L. Koch), *Obisium simoni* (L. Koch), *silvaticum* (C. L. Koch), *simile* (L. Koch), *dumicola* (C. L. Koch), *muscorum* (Leach), *manicatum* (C. L. Koch), *Chthonius trombidioides* (Latr.), *orthodactylus* (Leach). (B) *Pseudoscorpiones* novi vel minus cogniti. There are described 8 spp. nn.

*Cambridge, O. P. Pseudoscorpions new to Britain. Naturalist (n.s.) x. p. 103.

Canestrini, F. Chernetides Italici. Padova : 1885, 20 pls.

Heterolophus, g. n., p. 24, allied to *Obisium*, for *H. guttiger*, p. 24, Hass. 3 & 4, and *nitens*, p. 25, fig. 5, spp. nn., Sao Paolo, Brazil ; Tömösvary,

Chelifer danaus, p. 19, fig. 7, Corfu, Morea, *macrochelatus*, p. 20, figs. 12 & 13, Columbia, Tömösvary, *t. c.*, spp. nn. ; *C. punctatus*, p. 45, pl. iv.

Phrynidæ.

Phrynus savatieri, sp. n., de Rochebrune, Bull. Soc. Philom. viii. p. 28, Gambia.

Thelyphonidæ.

Thelyphonus insulanus, sp. n., Keyserling, Arachn. Austr. ii. p. 42, pl. iv. fig. 2, Kandavu, Fiji Is.; *T. bohemicus*, sp. n., fossil, strata of Radnitz, near Rakonitz, Bohemia, Kusta, SB. böhm. Ges. 1884, pp. 186 & 401, with 2 pls.

ANTHRACOMARTI (extinct order).

Anthracomartus krejcii, Kusta, *op. cit.* 1883, p. 340, with pl.; *A. minor*, p. 398, fig. 1, *affinis*, p. 399, fig. 2, spp. nn., *id. op. cit.* 1884, from Radnitz.

Brachypyge carbonis (Woodw.) is an *Anthracomartus*; Scudder, C.R. ent. Belg. 1885, p. 84; *A. trilobitus*, Scudd., woodcut: Scudder, *t. c.*

SCORPIONIDEA.

Lloyd-Morgan, C. Suicide of Scorpions. Nature, xxvii. p. 313.

Experiments were negative. (See also *t. c.* p. 530.)

Thorell, T., & Lindström, G. On a Silurian Scorpion from Gotland. Sv. Ak. Handl. xxi. No. 9, pp. 1–33, with pl.

A Silurian foss. scorpion is named *Palæophonus* (g. n.) *nuncius* (sp. n.), forming the new suborder *Apoxypodes*, fam. *Palæophonoidæ*, which is characterized by the apical tarsi being acute, destitute of claws. The suborder *Dionychopodes* has the apical tarsi cylindrical, with two movable claws. This suborder is divided into the fossil *Anthracoscorpii*, with the families *Cyclophthalmoidæ*, gen. *Cyclophthalmus* (Corda), and *Eoscorpionidæ* (Scudd.), gg. *Eoscorpius* and *Centromachus*, and the recent *Neoscorpii*, with the families *Pandinoidæ*, *Bothriuroidæ*, *Buthoidæ*.

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fig. 3, Gayndah, *brevispinosus*, p. 46, fig. 4, Gayndah, Rockham[illegible] Downs, *ramosus*, p. 47, fig. 5, Rockhampton, *brevidigitatus*, p. 48, fig. 6, Keyserling, *t. c.* spp. nn. ; *C. mayeti*, sp. n., Simon, Explor. Tunisie, p. 48, Gafsa.

Chernes armatus, p. 17, figs. 8 & 9, Ashanti, *affinis*, p. 18, figs. 10 & 11, Corfu, spp. nn., Tömösvary, *t. c.*

Chthonius cæcus (!), sp. n., Packard, Am. Nat. 1884, p. 203, Weyer's Cave, Va. ; *C. cæcus* (!), sp. n., Simon, Ann. Soc. Ent. Fr. 1885, p. 214, Ossa, Thess.

Minniza deserticola, sp. n., *id.* Explor. Tunisie, p. 50, Gabès.

Obisium cæcum, sp. n., *id.* Ann. Soc. Ent. Fr. 1883, p. 279, Ponta Delgada ; *O. hellenum*, sp. n., *id. op. cit.* 1884, p. 349, Athens ; *O. cavicola*, sp. n., Packard, *t. c.* p. 202, Newmarket Cave, Va.

Olpium dimidiatum (L. Koch) redescribed and figured, p. 21, fig. 6 ; *O. semivittatum*, p. 22, figs. 1 & 2, Corfu, *biaroliatum*, p. 23, figs. 15–18, India, spp. nn. : Tömösvary, *t. c.*

Rakovnicia (g. n.) *antiqua*, sp. n., fossil from the Coal Measures near Rakonitz, Bohemia ; Kusta, *t. c.* p. 400, fig. 3.

Opiliones.

Sörensen, W. *Opiliones laniatores* Musei Hauniensis. Nat. Tids. (3) xiv. pp. 555–646.

The author regards *Gibbocellum* (Steck.) as a true Opilionid, belonging to the *Palpatores* (Thor.). The *Palpatores* contain the families *Sironoidæ*, *Troguloidæ*, *Nemastomoidæ*, *Ischyropsalidæ*, and *Phalangioidæ* ; the *Laniatores* the families *Phalangodidæ*, *Cosmetidæ*, *Assumioidæ*, *Hernandarioidæ*, *Gonyleptoidæ*, *Cælopygoidæ*, *Pachyloidæ*. The genera *Mischonyx* and *Collonychium* (Bertk.), founded on undeveloped examples, are dropped. The author describes further 4 new genera and 23 new species. *Phalangodes* (Tellk.) is not = *Scotolemon* (Luc.) ; with the latter are *Phalangodes* (Simon) and *Ptychosoma* (Sör) synonymic. The following new families, genera, and species are described : *Cosmetus marginatus*, p. 588, Bahia, Brazil, *holmbergi*, p. 590, Salta, Argentine, *albolineatus*, p. 592, New Orleans, *argentinus*, p. 593, A., *paraguayensis*, p. 594, P. ; *Assamioidæ*, fam. n., with *Assamia* (g. n.) *westermanni*, sp. n., p. 596, Assam ; *Hernandarioidæ*, fam. n., with *Hernandaria* (g. n.) *scabricula*, sp. n., p. 599, Argentina ; *Gonyleptoidæ*, fam. n., with *Gonyleptus pustulatus*, *bimaculatus*, spp. nn., p. 605, and *carinatus*, sp. n., p. 607, Brazil ; *Mitobates discolor*, sp. n., p. 611, Brazil ; *Opisthoplites* (g. n.) *ypsilon*, sp. n., p. 615, Brazil ; *Asarcus lutescens*, sp. n., p. 617, Brazil ; *Cælopygoidæ*, fam. n., with *Amphorus* (C. L. Koch) and *Cælopygus* ; *C. lætabundus*, sp. n., p. 619, Brazil ; *Pachyloidæ*, fam. n., with *Eusarcus hastatus*, sp. n., p. 624, Minas Geraes, *pusillus*, sp. n., p. 625, Rio de Janeiro, *Discocyrtus emydeus*, sp. n., p. 629, Brazil, *dilatatus*, sp. n., p. 631, Paraguay, *fornicatus*, sp. n., p. 633, Brazil ; *Gyndes* (g. n.) *reinhardi*, sp. n., p. 638, Brazil ; *Pachylus minutus*, sp. n., p. 643, Paraguay ; *Stygnus validus*, sp. n., p. 6[illegible] Guinea.

Thrasychirus, g. n., allied to *Oligolophus*, for *T. dentichelis*, p. 26, fig. 21,

, p. 27, figs. 22 & 23, spp. nn., from Ile Hoste, S. America; mon, Bull. Soc. Zool. 1884.

Biantes, g. n. *Phalangodid.*, for *B. longimanus, vittatus*, spp. nn., *id. op. cit.* 1885, p. 25 (sep.), pl. x. figs. 23 & 24.

Phlegmacera, g. n. *Phalangiad.*, for *P. cavicolens*, sp. n., Packard, Am. Nat. 1884, p. 203, Bat Cave, Carter Co., Kentucky.

Dasylobus fusco-annulatus, sp. n., Simon, Ann. Soc. Ent. Fr. 1883, p. 298, Canaries; *D. egænoides*, sp. n., *id. op. cit.* 1885, p. 215, Ossa, Thessaly.

Egænus diadema, sp. n., *id. t. c.* p. 214, Ossa.

Hinzuanius africanus, sp. n., Pavesi, Ann. Mus. Genov. xx. p. 88, Let-Marefia.

Nemastoma thessalum, p. 216, *stussineri*, p. 217, spp. nn., Simon, *t. c.*, Ossa.

Opilio ischionotatus, sp. n., Dugès, Nat. Mex. vii. p. 194, pl. ii. figs. 1–10, Mexico.

Phalangium amanense, p. 193, Akbès, *hebraicum*, p. 194, Beirut, Antura, and var. *leucomelas*, p. 196, Naplus and Latrum, Palestine, spp. nn., *id. op. cit.* 1884; *P. semiechinatum*, sp. n., *id.* Explor. Tunisie, p. 53, Djebl Reças.

Karsch, B. E. Z. 1884, p. 143, tabulates the genera of the family *Sironidæ*, viz. *Pettalus, Stylocellus, Leptopsalis, Siro*. The genus *Siro* contains 5 species:—*corsicus* (Sim.), *rubens* (Latr.), *duricorius* (Joseph), *cyphopselaphus* (Joseph), and *inæquipes*, sp. n., p. 146, Pajarès, Asturia.

Trogulus torosus, sp. n., Simon, Ann. Soc. Ent. Fr. 1885, p. 218.

Solifugæ.

Jenner Weir exhibited specimens of *Galeodes* with their pedunculated organs on the hind legs, the use of which seems to be suctorial, enabling the creature to obtain a firmer hold; P. E. Soc. 1885, p. xxiii.

Biton tunetanus, p. 46, La Goulette, and *velox*, p. 47, Gabès, spp. nn., Simon, Explor. Tunisie.

Datames striatus, p. 255, pls. i. fig. 1, & ii. fig. 7, Arizona, *girardii*, p. 257, pl. ii. fig. 12, *constricta*, p. 258, pls. i. fig. 2, & ii. fig. 13, *dilatata*, p. 259, pls. i. fig. 3, & ii. fig. 15, *cinerea*, p. 260, pls. i. fig. 4, & iii. figs. 17–31, spp. nn., from N. America, Osborn (and the late J. D. Putnam), P. Davenp. Ac. iii.

Rhax annulata, sp. n., Simon, Bull. Soc. Zool. x. p. 2, Gundacul; *R. corallipes*, sp. n., *id.* Explor. Tunisie, p. 45, Zarzis.

PANTOPODA.

Hansen, H. F. Fortegnelse over de hidtil i de Danske Have fundne Pycnogonider eller Sospindler. Nat. Tids. (3) xiv. pp. 647–652.

Haswell, W. A. On the *Pycnogonida* of the Australian Coast, with Descriptions of New Species. P. Linn. Soc. N. S. W. ix. pp. 1021–1034, pls. liv.-lvii.

Enumerates, beside the new species, *Ascorrhynchus minutus*, Hoek,

off Port Philip, *Colossendeis gigas-leptorrhynchus*, Hoek, S. cnp[illegible] *Achelia lævis* var. *australiensis*, Miers, Port Jackson, *Pallene lævis*, Hoek, S. Coast, *P. chiragra*, M.-Edw., Jervis Bay, *P. australiensis*, Hoek, S.-E. Coast, *P. languida*, Hoek, Melbourne, *Phoxichilidium hoeckii*, Miers, Torres Straits, *Phoxichilus charybdæus*?, Dohrn, Port Molle, *Pycnogonum australe*, Grube.

Hoek, P. P. C. Pycnogonids of the Faroe Channel, dredged by H.M.S. 'Triton,' in 1882. Tr. R. Soc. Edinb. xxxii. pp. 1–10, with 1 pl.

11 species, 1 new.

Nymphopsis, g. n. First pair of appendages well-developed (cheliform); second pair, well-developed (palpiform), with nine joints; third pair with seven joints, none of them provided with compound spines. *N. armatus*, sp. n., Port Molle, Queensland; Haswell, *t. c.* p. 1025, pl. lv. figs. i.–iv.

Ammothea assimilis, Clark L., p. 1026, pl. lv. figs. 5–9, *longicollis*, Port Jackson, p. 1028, pl. lvi. figs. 1–4, spp. nn., Haswell, *t. c.*

Colossendeis tenuissima, Port Denison, sp. n., *id. t. c.* p. 1029, pl. lvi. figs. 5–8.

Nymphon æquidigitatum, p. 1022, pl. liv. figs. 1–5, Port Jackson, *validum*, p. 1024, figs. 6–9, Port Stephens, spp. nn., *id. t. c.*

Pallene pachych[e]ira, Port Jackson, sp. n., *id. t. c.* p. 1030, pl. lvii. figs. 6–9.

Pallenopsis tritonis, sp n., Hoek, *t. c.* Faroe Channel.

Phoxichilidium tubiferum, Port Jackson, sp. n., Haswell, *t. c.* p. 1032, pl. lvii. figs. 1–5.

ACARINA.

Berlese, A. Acarorum systematis specimen. Bull. Ent. Ital. xvii. pp. 125–135.

The author distinguishes the families *Demodicidæ*, gen. *Demodex*, *Phytoptus*. *Sarcoptidæ*: subf. *Psoroptidæ*, gen. *Cytholeichus*, *Sarcoptes*, *Psoroptes*, *Chorioptes*, *Myocoptes*; subf. *Analgesidæ*, gen. *Anoplites*, *Dermoglyphus*, *Freyana*, *Pterolichus*, *Falciger*, *Bdellorrhynchus*, *Paralges*, *Xoloptes*, *Pteronyssus*, *Pteralloptes*, *Protalges*, *Megninia*, *Analges*, *Alloptes*, *Pterocolus*, *Proctophyllodes*, *Pterodectes*, *Pterophagus*; subf. *Tyroglyphidæ*, gen. *Hypopus*, *Chortoglyphus*, *Trichodactylus*, *Tyroglyphus*, *Histiogaster*, *Rhizoglyphus*, *Glycyphagus*. *Oribatidæ*: subf. *Tarsonemidæ*, gen. *Tarsonemus*, *Disparipes*, *Pygmephorus*; subf. *Hoplophoridæ*, gen. *Hoplophora*, *Tritia*; subf. *Nothridæ*, gen. *Hermannia*, *Carabodes*, *Belba*, *Damæus*, *Eremæus*, *Scutovertex*, *Liodes*, *Nothrus*; subf. *Oribatidæ*, gen. *Cepheus*, *Liosoma*, *Oppia*, *Neozetes*, *Oribates*, *Pelops*; subf. *Panopliidæ*, gen. *Panoplia*. *Gamasidæ*: subf. *Uropodidæ*, gen. *Polyaspis*, *Discopoma*, *Cillibano*, *Uropoda*, *Trachynotus*, *Cœleus*; subf. *Sciidæ*, gen. *Sejus*; subf. *Epicriidæ*, gen. *Epicrius*, *Podocinum*; subf. *Celeripedidæ*, gen. *Celeripes*, *Antennophorus*; subf. *Dermanyssidæ*, gen. *Ophionyssus*, *Liognathus*, *Dermanyssus*; subf. *Gamasidæ*, gen. *Iphis*, *Lælaps*, *Macrocheles*, *Gamasus*. *Ixodidæ*: subf. *Ixodidæ*, gen. *Ixodes*; subf. *Argasidæ*, gen. *Argas*. *Trombidiidæ*: subf.

gen. *Eupodes*, *Megamerus*, *Scyphius*, *Penthaleus*, *Tydeus*, *Bdellonotus*, *Pygnetes*; subf. *Cheyletidæ*, gen. *Harpirhynchus*, *Picobia*, *Myobia*, *Cheyletus*; subf. *Tetranychidæ*, gen. *Tetranychus*, *Heteronychus*, *Bryobia*, *Rhaphignathus*; subf. *Rhyncholophidæ*, gen. *Rhyncholophus*, *Smaridia*, *Smaris*; subf. *Bdellidæ*, gen. *Bdella*, *Eupalus*, *Cryptognathus*; subf. *Alychidæ*, gen. *Michaelia*, *Alychus*; subf. *Trombidiidæ*, gen. *Geckobia*, *Actineda*, *Erythæus*, *Tanaupodus*, *Trombidium*. *Hoplopidæ*: gen. *Caculus*.

[Berlese, A.] Di alcuni Acari del Museo di Firenze, colla descrizione di tre nuove specie appartenenti alla famiglia dei Trombididi. *T. c.* pp. 136–144.

——. Supra alcuni Acari. Lettera al dott. G. Haller in Zurigo. *T. c.* pp. 145–148.

Refers to species described by Haller:—*Oribata monodactyla* (Hall.) = *dentatus* (Berl.); *Damæus craterifer* (Hall.) = *dugesii* ? or *bicostatus* ? (Koch); *Michaelia* (Hall.) is founded on a larval form like *Hypochthonius* or *Murcia* (Koch); *Cheyletia laureata* (Hall.) = *Cheyletus ornatus* ? (Can. & Fanz.) = *flabellifer* (Mich.).

Canestrini, G. Acari nuovi o poco noti. Atti. Ist. Venet. (6) ii. pp. 693–724, pls. vi.–ix.

Contains—I. Acari Italiani, pp. 693–704; II. Acari dell' Australia, pp. 705–722.

——. Prospetto dell' Acarofauna Italiana. *Op. cit.* ii. pp. 1397–1443, 1563–1607, & 1631–1662; iii. pp. 319–354 & 1647–1683, pls. iv.–vii. & xviii.–xxiii.

*Haller, G. Beiträge zur Kenntniss der schweizerischen Milbenfauna.

Karpelles, —. Miscellen. VI. Bericht d. naturw. Vereins a. d. k. k. technischen Hochschule Wien, p. 16 *et seq.*

Contains: *Tyroglyphus diversipes*, sp. n.; Altes und Neues über Milben; Neue Phytoptocecidien.

Mina' Palumbo. Acarofauna Sicula. Nat. Sicil. iv. p. 246 *et seq.*

Picaglia, L. Sopra una particolare dermatosi del cavallo. Atti Soc. Mod. Mem. (Rendic.) (3) ii. p. 86.

The dermatosis was caused by a mite.

Ixodidæ.

Argas turicata and *megnini*, spp. nn., Dugès, Nat. Mex. vi. pp. 195–198, pl. iv. On the Mexican species of *Argas*, see also Mégnin, Le Nat. 1883, p. 309, J. de l'Anat. Phys. xxi. p. 460 *et seq.*, pls. xx. & xxi.

Amblyomma quadriguttatum, sp. n., Pavesi, Ann. Mus. Genov. xx. p. 90, Scioa.

Hæmaphysalis erinacei, sp. n., *id. t. c.* p. 484, Tunis, on *Erinaceus algirus*. *H. papuana* (Thor.) redescribed and figured by Canestrini, Atti Ist. Venet. (6) ii. p. 705, pl. vi. fig. 4.

Rhipicephalus bilenus, beccarii, sp. n., Pavesi, *t. c.* p. 102, Keren.

Hydrachnidæ.

Asperia lemani, sp. n., Haller, p. 12, fig. 9, Lake Leman.

Nesæa koenikei, sp. n., *id.* p. 14, figs. 10–12, Lake Leman.

Asperia lemani = *Midea elliptica* (O. F. Müller), ♀; *Nesæa koenikei* = *Midea elliptica* (O. F. Müller), ♂; Koenike, Zool. Anz. viii. p. 691.

Atax ypsilophorus (Bonz) in N. America, on *Anodonta fluviatilis*; Leidy, P. Ac. Philad. 1883, p. 54, and Ann. N. H. (5) xi. p. 391. *A. alzatei*, sp. n., Dugès, Nat. Mex. vi. p. 344, pl. viii., Guanajuato.

Hydrachna odontognatha, sp. n., Canestrini, Atti Ist. Venet. (6) ii. p. 719, Australia, on a water-beetle.

Acercus uncinatus, p. 215, Varel, Oldenburg; *Arrhenurus crassipetiolatus*, p. 216, Bremen, *claviger*, p. 219, *fimbriatus*, p. 220, Bremen, *dubius* (= *tricuspidatus*, Neum., *nec* Müll.), p. 220, *bruzelii* (= *albator*, C. L. Koch, *emarginator*, Bruz., *nec* Müll.), p. 221; *Hydrodroma flexuosa*, p. 222, Iaderberg, Oldenburg: Könike, Abh. Ver. Brem. ix., spp. nn.

Bdellidæ.

Eupalopsis, g. n., for *E. maseriensis* (Can. & Fanz.); Canestrini, Atti Ist. Venet. (6) iii. p. 1670.

Bdella marina, sp. n., Packard, Am. Nat. 1884, p. 828, woodcuts, New Jersey; *B. lignicola*, sp. n., Canestrini, *t. c.* p. 1672, pl. xxiii. fig. 1, Padua.

Eupalus brevirostris, sp. n., *id. t. c.* p. 1680, fig. 6, Padua.

Oribatidæ.

Michael, A. D. New British *Oribatidæ*. J. R. Micr. Soc. (2) v. pp. 385–397, pl. vii.

Describes *Cepheus bifidatus* larva and nymph; *Notaspis juncta*, sp. n., p. 390, fig. 3, *N. longilamellata*, sp. n., p. 391, fig. 4, *N. pectinata*, sp. n., p. 392, fig. 5, *N. clavipectinata*, sp. n., p. 392, fig. 6, *N. quadricarinata*, sp. n. p. 393, fig. 7, *N. lanceolatus*, sp. n., p. 394, fig. 8; *Dapæus sufflexus*, sp. n., p. 394, fig. 9, *D. tenuipes*, sp. n., p. 395, fig. 10; *Hypochthonius lanatus*, sp. n., p. 396, fig. 11.

Schlechtendal, D. v. Beiträge zur Kenntniss der Pflanzengallen. JB. Ver. Zwickau, 1883, pp. 1–23; ii., Acarocecidien, pp. 3–13.

The author confirms the statement that *Tarsonemus* causes galls on *Stipa pennata* and *S. capillata*.

Karpelles, I. Eine auf dem Menschen und auf Getreide lebende Milbe (*Tarsomenus intectus*, sp. n.). Anz. Ak. Wien, 1885, No. xvii. pp. 160 & 161.

Serrarius, g. n., proposed for (*Liosoma*) *microcephala*, by Michael, *op. cit.* iii. p. 25.

Michaëlia, g. n., allied to *Hoplophora*, for *M. paradoxa*, sp. n., Haller, Arch. f. Nat. 1884, p. 229, pl. xvi. figs. 5–8, Carlsruhe.

[illegible]haracters given) *leporosus*, sp. n., *id. t. c.* p. 225, pl. xv. [illegible] America.

Nothrus kornhuberi, sp. n., Karpelles, Arch. f. Nat. 1883, p. 455, with 3 woodcuts, and B. E. Z. 1884, p. 32 ; *N. pileiformis*, p. 33, Pennsylvania, *malleolus*, p. 34, Pennsylvania, *id.* B. E. Z. 1884, spp. nn. ; *N. kuhli*, *sulcatus*, *punctulum*, spp. nn., fossil in amber, Karsch, B. E. Z. 1884, p. 176.

Damæus craterifer, sp. n., Haller, *t. c.* p. 226, pl. xvi. figs. 1–4, Nizza, Marseille.

Oribata simplex, *monodactyla*, p. 221, pl. xv. fig. 3, *americana*, p. 222, fig. 4, *rileyi*, p. 223, fig. 5, spp. nn., *id. t. c.*, America.

Tegeocranus cepheiformis (Nic.). Nymph ; Michael & Poppe, Abh. Ver. Brem. ix. p. 207, pl. viii.

Gamasidæ.

Fedrizzia, g. n., allied to *Holostaspis* and *Uropoda*, for *F. grossipes*, sp. n., Canestrini, Atti Ist. Venet. (6) ii. p. 707, pl. viii. figs. 1 & 2, Australia, on a Geotrupid.

Berlesia, g. n., for *B. rapax*, sp. n., *id. t. c.* p. 714, pl. ix. fig. 4, Australia.

L[e]iognathus, g. n., p. 1573, for *L.* (*arcuatus*, Koch, *silviarum*, Can. & Fanz., and) *uncinatus*, sp. n., *id. t. c.* p. 1660, Toscana.

Hypoaspis, g. n., p. 1569, for *H. krameri* (Can.), *horridus* (Kram.), *uncinatus* (Can.), &c., *id. t. c.*

Ophionyssus, g. n., for (*Dermanyssus*) *natricis* (Gerv.), Mégnin, Bull. Soc. Zool. 1884, p. 107 *et seq.*, with pl.

Celæno australiana, sp. n., Canestrini, *t. c.* p. 715, pl. vi. fig. 2, Australia, on a Cetoniid.

Gamasus tiberinus, sp. n., *id. t. c.* p. 697, Rome, Ponte Molle.

Kramer, P. Ueber *Halarachne halichoeri*, Allm. Z. Naturw. lviii. pp. 46–74, pl. iii.

Only females and larvæ were found. The author gives details of external and internal anatomy.

Iphis bombicolens, sp. n., Canestrini, *t. c.* p. 1634, Padua, on *Bombus*.

Lælaps aculeifer, sp. n., p. 698, Padua, *holastaspoides*, p. 700, Messina, *dolic[h]acanthus*, p. 709, pl. vii. figs. 2 & 3, Australia, on a Lamellicorn beetle, *coniferus*, fig. 4, and *stilosus*, pl. ix. fig. 3, on a Longicorn beetle, p. 711, spp. nn., *id. t. c.* (*L. aculeifer* is later, p. 1598, placed in the g. n. *Hypoaspis*.)

Sejus acanthurus, sp. n., p. 712, pl. ix. figs. 1 & 2, Australia.

Pteroptus euryalus, sp. n., *id. t. c.* p. 1657, Toscana, on *Rhinolophus euryale* ; *P. cynonycteridis*, sp. n., Karsch, SB. Ges. Marb. 1884, p. 69, Rolas, on *Cynonycteris stramineus*.

Uropoda krameri, p. 700, and *cristiceps*, p. 702, Trentino, *spinulipes*, p. 714, Australia, on a Geotrupid, *patavina*, p. 1647, Padua, on *Blaps*, *id. t. c.*

Trombidiidæ.

Cheyletiella, g. n., for *parasitivorax* (Mégn.), Canestrini, Atti Ist. Venet. iii. p. 1658; the species described and figured, p. 1663, pl. xix. fig. 3.

Harpicephalus, n. n. for *Harpirrhynchus* (Mégn.), preocc.; *id. t. c.* p. 1657.

Cheylurus, g. n., for *C. socialis*, sp. n., Trouessart, Bull. Soc. Angers, 1885, p. 90, on birds.

Laboulbène & Mégnin. Mémoire sur le *Sphærogyna ventricosa* (Newport). J. de l'Anat. Phys. xxi. pp. 1–17, pl. i.

Synonyms of this species are *Acarus tritici* (Lagrèze), *Heteropus ventricosa* (Newp.), *Physogaster larvarum* (Lichtenst.), the new genus *Sphærogyna* being proposed on account of the globe-shaped abdomen of the female. This is ovoviparous, and gives birth to adult males and females; the latter are fecundated at once.

Linopodes globosus, sp. n., Canestrini, *op. cit.* ii. p. 696, Roma.

Ottonia spinosa, sp. n., *id. op. cit.* iii. p. 333, pl. v. fig. 1, D[illegible] su Tavoli, on plants. [To the same genus belongs also (*Trombidium*) *bifoliosum* (Can.), p. 332; *vide infrà*.]

Rhyncholophus agilis, p. 694, Trentino, *siculus*, p. 695, Sicily, spp. nn., *id. op. cit.* ii.; *R. similis*, Sardinia, p. 338, and *pulcher*, Genovesato, p. 342, pl. vii. fig. 1, spp. nn., *id. op. cit.* iii.; *R. cavannæ*, p. 137, fig. 1, *globiger*, p. 139, fig. 2, spp. nn., from Italy, Berlese, Bull. Ent. Ital. xvii. pl. i.

Tetranychus dugesii, sp. n., D. Cano y Alcacio, Nat. Mex. vii. p. 197, pl. ii. figs. 1–5, Mexico, on *Medicago denticulata* (Willd.).

*Wood-Mason, J. Report on the Tea Mite (*Tetranychus bioculatus*) . . . of Assam. London: 1884, 8vo, pp. 1–20, pls. i.–iii.

Trombidium bifoliosum (= *Ottonia bifoliosa*, *vide suprà*), p. 693, Florenz, *papuanum*, p. 718, pl. vi. fig. 5, on an Australian Longicorn beetle, spp. nn., Canestrini, *op. cit.* ii.; *T. setulosum*, sp. n., Berlese, *t. c.* p. 141, pl. i. fig. 3, Cagliari.

Myobiidæ.

Disparispes, g. n., for *D. bombi*, sp. n., Michael, Tr. L. S. xvii. p. 390, pl. xv.

Phytoptidæ.

Löw, F. Ueber neue und schon bekannte Phytoptocecidien. Verh. z.-b. Wien, 1885, pp. 451–470.

New galls produced by *Phytoptus* are recorded on *Achillea nana*, *Anchusa officinalis*, *Galium infestum*, *G. lucidum*, *Gentiana rhætica*, *Lycium europæum*, *Rubus gremelii*, *Sedum album*, *Sempervivum hirtum*, *Seseli hippomarathrum*, *Vitex agnus castus*.

F. Ueber Gallmilben (*Phytoptus*, Duj.). SB. Ak. Wien, xc. p. 46, with pl.

The author describes the generative organs of the males, for the first time found. *P. galii* and *P. fraxini*, spp. nn., p. 44, figs. 1–8, & p. 52, figs. 9–12.

MARTIN, L. J. A Botanical Study of the Mite Gall found on the Black Walnut. Am. Nat. 1885, p. 136, pls. iv.–vi.

OSBORN, H. Note on *Phytoptidæ*. P. Am. Ass. xxxii. p. 322.

SCHLECHTENDAL, D. v. Acarocecidien. JB. Ver. Zwickau, 1885, pp. 3–13.

A new *Phytoptus*-gall on *Achillea ptarmica*, p. 8.

THOMAS, F. Beiträge zur Kenntniss der in den Alpen vorkommenden Phytoptocecidien. MT. Bot. Ver. für Gesam. iv. p. 16.

The author enumerates and describes 87 galls. Remarks are made on *Phytoptus villificus*, sp. n., p. 44, on *Hieracium murorum*; *P. gentianæ*, sp. n., p. 45, on flowers of *Gentiana germanica*; *P. glacialis*, sp. n., p. 56, on *Salix herbacea*.

TYROGLYPHIDÆ.

NALEPA, A. Die Anatomie der Tyroglyphen. SB. Ak. Wien, xcii. p. 116, with 3 pls.

The object of this elaborate article is the anatomy of *Glyciphagus* (*Trichodactylus*, Berlese) *anonymus* (Hall.).

MICHAEL, A. D. Notes on the Life-Histories of some of the little-known *Tyroglyphidæ*. J. R. Micr. Soc. (2) v. pp. 19–32, pl. iii.

The author found *Acarus malus* (Riley, *nec* Shimer) on *Phragmites communis*. The *Hypopus* of this species is the parasite of *Oribata*, according to Canestrini and Fanzago, and the male resembles *Tyrogl. carpio* (Kramer). The species is named *Tyrogl. corticis*, p. 26 (*corticalis*, p. 27, and on the plate). The *Hypopus* of *Rhizoglyphus robini* is described and figured, p. 31, figs. 15–19.

Histiogaster, g. n., for *H.* (*Tyroglyphus*) *carpio* (Kramer); Berlese, Lettura fatta alla R. Accad. di Padova, 1883.

Pullea, g. n., allied to *Tyroglyphus*, for *P. discoidalis*, sp. n., Canestrini, *t. c.* ii. p. 720, pl. vi. fig. 1, Australia, on a Phytophagous beetle.

Tyroglyphus carpio (Kram.) described by Karpelles, B. E. Z. 1884, pp. 1–14; a review of 13 species of the genus *Tyroglyphus* is added, pp. 15–25. *T. longisetosus*, sp. n., *id. t. c.*, p. 241, on beetles from tropical Africa; *T. crassipes*, p. 218, pl. xv. fig. 1, *curtus*, p. 219, fig. 7, spp. nn., Haller, Arch. f. Nat. 1884, America; *T. queenslandiæ*, sp. n., Canestrini, *t. c.* p. 721, fig. 3, Queensland, on *Cetonia*; *T. diversipes*, sp. n., Karpelles, Bericht naturw. Ver. a. d. k. k. technischen Hochschule Wien, vi. p. 16, Vienna, on bread.

Cheyletus rufus, p. 231, *parumsetosus*, p. 238, spp. nn., *id.* B. E. Z. 1884, on beetles from tropical Africa; *C. laureatus*, sp. n., Haller, *t. c.* p. 234, pl. xvi. fig. 9, Germany.

Sarcopitdæ.

Trouessart, E. L. Les Sarcoptides plumicoles ou Analgesines. I. Les Ptéroliches. J. Microgr. 1885. Also separately, Paris: 1885, pp. 1–84, 2 pls., 17 woodcuts.

The *Sarcoptidæ* are divided into *S. psoriques* (*Sarcoptinæ*), *S. plumicoles* (*Analgesinæ*), *S. cysticoles* (*Cytolichinæ*), *S. gliricoles* (*Listrophorinæ*), *S. detriticoles* (*Tyroglyphinæ*); the *Analgesinæ* into *Dermoglyphæ*, *Proctophyllodeæ*, *Analgeseæ*, *Pterolicheæ*. The *Pterolicheæ* are the subject of the present paper. Many new forms are described :—*Freyana anatina* var. n. *simplex*, var. n. *armata*, var. n. *largifolia*, p. 13 (*Michaelichus*, subg. n., for *Canestrinia*, preocc., p. 14), (*Microspalax*, subg. n.) *manicata*, p. 17, on *Puffinus cinereus*, and var. *brevipes*, p. 18, on *P. obscurus*; *chamayi*, p. 19, on *Meleagris gallopavo*; *Pterolichus canestrinii*, p. 22, South America, on *Ara denticulatus*, p. 23, Brazil, on *Conurus cruentatus*, and var. *inermis* on *Caica leucogastra*, and var. *cribriformis*, p. 24, on *Psittaculus passerinus*; *P. hemiphyllus*, p. 25, Guyana, on *Amazona lunulata*, and var. *porrectus*; *P. hastifolia*, p. 26, on *Conurus smaragdinus*; *P. martini*, p. 27, France, on *Sterna hirundo*; *P. crassus*, p. 28, India, on *Buceros coronatus*; *P. minor*, on *Falco subbuteo*, and *P. cataphractus* on *Ceriornis satyra*, from Himalayas, p. 29; *P. decoratus*, p. 30, on *Cryptonyx cristatus*, from Java; *P. pustulatus*, p. 31, Guyana, on *Crax alector*; *P. ornatus*, p. 32, Australia, New Guinea, and India, on parrots; *P. parallelus*, p. 34, France, on *Scops zorca*; *P. eventratus*, Europe, on *Glaucidium passerinum*, and *P. longiventer*, South America, on *Syrnium nebulosum*, p. 35; *P. chiragricus*, p. 36, New Zealand, on *Pezoporus formosus*; *P. affinis*, p. 37, Australia, on *Platycercus flavcolus* and *Pl. pennanti*; *P. intermedius*, Europe, on diurnal raptatores; *P. struthionis* on *S. camelus* and *Rhea americana*; *P. otidis* on *O. houbara*, and *P. cuculi* on *C. canorus* and other species, p. 40; *P. pyroderi*, South America, and *P. biemarginatus*, South America, on *Capito auratus*, p. 41; *P. rhamphastinus*, South America, on *Rhamphastos*, and *P. phylloproctus*, Philippines, on *Haliaetus leucogaster*, p. 42, and also var. *minor*, p. 43, Australia, on *Haliaetus indus*; *P. hirundo*, Guiana, on *Harpyia destructor*, and *P. circiniger*, Philippines, on *Buceros*, p. 44; *P. attenuatus*, *P. ogivalis*, p. 43, with the foregoing; *P. limosæ* var. *mucronatus*, var. *selenurus*, on *Limosa* and *Totanus*; *P. pallidus*, p. 46, on *Œdicnemis crepitans*; *P. forficiger*, p. 47, on *Colymbus glacialis*; *P. parræ*, p. 48, India, on *Hydrophasianus chirurgus*; *P. fulicæ* and *proctogamus*, p. 49, on *Fulica atra*; *P. rehbergi* var. *gracilis*, p. 50, on *Himantopus melanopterus*; *P. phœnicopteri*, p. 51, on *Phœn. antiquorum*; *P. buchholzi* var. *hastiger*, Europe, on *Tringa cinclus*, Bengal, on *Chettusia cinerea*, and var. *fasciger*, Europe, on *Totanus*, *Tringa*, *Strepsilas*, p. 52, var. *securicatus*, Europe, on *Tringa subarquata*; *P. microphyllus*, Gold Coast, on *Corythaix meriani*, p. 53; *P. columbi* var. *major*, p. 54, Europe, on *Podiceps cristatus* and *Colymbus septentrionalis*; *P. vexillarius* and varr. *minor*, *homophyllus*, and *minutus*, pp. 55 & 56, India, on *Buceros*; *P. xiphiurus*, p. 57, Europe, on *Charadrius minor*; *P. interifolia*, p. 58, on *Actitis hypoleucus*; *P. theca*, p. 59, on *Sterna*; *P. setiger* on *Limosa rufa*, and *P. bouveti* on *Charadrius hiati-*

P. longitarsus, p. 61, on *Squatarola helvetica*; (*Protolichus* g. n.) *brachiatus*, p. 62, Austr., on parrots, and var. *crassior*, p. 63; *P. casuarinus*, New Guinea, on *Casuar. uniappendiculatus*, and *P. eurycnemis*, S. America, on parrots, p. 64; *P. falculiger*, p. 65, Australia, on *Nanodes australis*; (*Pseudalloptes*, subg. n.) *bimucronatus*, on *Lagopus*, and *gruis*, on *Grus cinereus*, p. 66; *P. aquilinus*, on *Aquila fulva*, *naevia*, and var. *milvulinus*, on *Milvus regalis*; *P. tenuis*, Ecuador, on *Amazona menstrua*, p. 67; *P. calcaratus*, on *Buceros*, *P. tritiventris*, on *Ara* and *Conurus*, p. 68, *forficiventris*, p. 69, on *Caica leucogastra*; *P. spathuliger*, *lobiger*, and *cultriventris*, p. 70; *P. securiventris*, *emargiventris*, *delibativentris*, and *discifer*, p. 71; *P. ferriventris*, p. 72; *P. berlesei*, p. 73; *P. pterocolurus*, p. 75, (*Oustaletia*, subg. n.) *pegasus*, p. 76, and var. *retusus*, p. 77; *Falciger*, g. n., for (*Dermalcichus*) *rostratus* (Buchh.) and *cornutus*, sp. n., p. 78, New Granada, on *Cyanocorax violaceus*; *Bdellorhynchus*, g. n., for *B. polymorphus*, sp. n., p. 79, Europe, on ducks; *Paralges*, g. n., for *P. pachycnemis*, p. 81, on *Struthio camelus* and *Rhea americana*; *Xoloptes didactylus*, p. 82, Europe, on *Ciconia alba*.

Trouessart, E. L. Notes sur la classification des Analgésiens, et diagnoses d'espèces et de genres nouveaux. Bull. Soc. Angers, 1885, pp. 46–89.

Psorergates, g. n., for *Dermatoryctes fossor* (Ehlers) or an allied species, Canada, on *Mus musculus*; Tyrrell, P. Canad. Inst. i. p. 337, pl. iv.

Sarcoptes minor var. *cati* (Hering) recorded from Canada; Tyrrell, *t. c.* p. 332, pl. iii.

Dimorphus urogalli, sp. n., on *Tetrao urogallus*; Nörner, Verh. z.-b. Wien, xxxiii. p. 91, pls. i. & ii.

Freyana chorioptoides, *gracilipes*, p. 395, *pelargica*, *halleri*, p. 396, *horrida*, p. 397, *nettapina*, *anserina*, (*Halleria*) *hirsutirostris*, p. 404, spp. nn., Mégnin & Trouessart, Le Nat. 1884.

Michaelichus, subg. n., for *Freyana heteropus* (Michael), p. 42, (*Microspalax*, subg. n., p. 43, for *manicata*, and) *chanayi*, sp. n., p. 44, *iid.* Bull. Soc. Angers, 1885.

LINGUATULIDA.

Pentastomum oxycephalum, from *Alligator lucius*, redescribed, with remarks on the anatomy; Chatin, Ann. Sci. nat. (6) xiv. Art. 2, with pl. *P. lari*, sp. n., Mégnin, Bull. Soc. Zool. xviii. p. 153, with pl., in the air-sacs of *Larus glaucus*. *P. protelis*, sp. n., Hoyle, P. R. Soc. Edinb. 1882–83, p. 219, with woodcuts, resembling *P. polyzonum* (Harley) from *Proteles cristatus* (Sparrm.; see also Bell, in Ann. N. H. (5) xiv. p. 92. *P. proboscideum* in the lung of *Crotalus adamanteus*; Leidy, P. Ac. Philad. 1884, p. 141.

MYRIOPODA

(Including PERIPATUS).

BY

T. D. Gibson-Carmichael, M.A., F.L.S.

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2. Bourne, G. C. Anatomy of *Sphærotherium*. J. L. S. xix. pp. 161–172, 3 pls.

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6. Costa, A. Diagnosi di nuovi Artropodi della Sardegna. Bull. Ent. Ital. xvii. p. 240. [Also in Atti Acc. Nap. (2) ii.]

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10. Grassi, B. I progenitori degli Insetti e dei Miriapodi—Morfologia delle Scolopendrelle. (Relazione dei T. Salvadori e Mich. Lessona.) Atti Acc. Tor. xxi. pp. 48–50.

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13. ——. Zur Morphologie der Chilopoden. Zool. Anz. viii. pp. 693–696.

14. [Haase, E.] Schlesiens Symphylen und Pauropoden. [illegible] 1885, 8vo, 15 pp.

15. Heathcote, F. G. On a Peculiar Sense-Organ in *Scutigera coleoptrata*, one of the *Myriopoda*. Q. J. Micr. Sci. xxv. pp. 253–260, pl. xviii.

16. Karsch, F. Berichtigungen und Ergänzungen aus den Jahren 1715 bis 1883 zur "Litteratur für die gesammte Myriopodenkunde" in Prof. Latzel's Werk "Die Myriopoden der österreichisch-ungarischen Monarchie." 2 Hälfte. Wien: 1884, pp. 374–399 & 414, gesammelt. Zool. Anz. viii. pp. 528–532.

17. Kennel, J. Entwicklungsgeschichte von *Peripatus edwardsii*, Blanch., und *Peripatus torquatus*, sp. n. II. Theil. Arb. Inst Würzb. viii. pp. 1–93, pls. i.–vi.

18. °Latzel, R. Die Myriopoden Kärntens. JB. Mus. Kärnt. xvii. pp. 33–46. [*Cf.* Zool. Anz. ix. p. 97.]

19. Richard, J. Un mot sur la phosphorescence des Myriapodes. Ann. Ent. Belg. xxix. pp. 15–21. Also separate, Gand: 1885, 8vo, 77 pp. [Abstr. in Bull. Ent. Ital. xvii. p. 173.]

20. Scudder, S. H. The Geological History of the Myriopods and Arachnids. Psyche, iv. pp. 245–250.

21. Sedgwick, A. The Development of *Peripatus capensis*. Q. J. Micr. Sci. xxv. pp. 449–468, 2 pls.

22. ——. On the Fertilized Ovum and the Formation of Layers in *Peripatus*. P. R. Soc. xxxix. pp. 239–244.

23. Stuxberg, A. Generic Position of *Polydesmus ocellatus* (*Craspedosoma*). Am. Nat. xix. pp. 400 & 401.

24. Tömösváry, E. Ueber den Bau der Spinndrusen bei den Geophiliden. Math. Nat. Ber. Ung. ii. pp. 441–445, 1 pl.

25. ——. *Myriopoda* a Joanne Xantus in Asia orientali collecta. Enumeravit speciesque novas descripsit. Term. füzetek, ix. pp. 63–72, 3 pls.

26. °Underwood, L. M. The North-American *Myriopoda*. Ent. Am. i. pp. 141–151. [*Cf.* Zool. Anz. ix. p. 97.]

Development and Phylogeny.

Haase (13) sees further confirmation of his views regarding the phylogeny of the Chilopods in the discovery of the new genus *Cermatobius*. This genus forms a new family, *Cermatobiidæ*, occupying a place between the *Scutigeridæ* and *Lithobiidæ*. He believes that it represents a proto-Scutigerid form, derived from his hypothetical *Protolithobius*.

Grassi (10) promises certain notes on *Scolopendrella* in its phylogenetic relations to Insects and Myriopods.

Kennel (17) continues his observations on the development of *Peripatus*, describing the development of the sexual organs.

...) and Sedgwick (21 and 22) also describe the development of *Peripatus*. The latter (22) describes certain facts in the development of *P. capensis*, which, "if generally applicable, reduce the adult body to a syncytium—to a multinucleated vacuolated protoplasmic mass, and embryonic development to a multiplication of nuclei, and a specialization of tracts in this mass."

Scudder (20) gives a résumé of all that is known as to the geological history of Myriopods, and discusses the relationships between the several groups.

Anatomy.

Bourne (2) describes certain points in the anatomy of *Spharotherium*. There are the three extra pair of appendages, copulatory in function; two pairs of these bear chitinous ridges, which being rubbed against similar ridges on the inner surface of the terminal tergite, act as a stridulating organ. The tracheæ resemble those of the *Chilopoda* rather than of the *Chilognatha*, but this fact is due to homoplasy, not to homology. The antennary sense-organs are conspicuous, and are described. Alimentary tract is curved as in *Glomeris*. A special sense-organ in the head, similar to that described by Leydig in *Glomeris*, is probably auditory.

Carmichael (4) describes the alimentary system in *Lithobius* and *Geophilus*.

Chalande (5) describes the respiratory system in certain French Chilopods. In *Himantarium* and *Geophilus* there is a pair of stigmata in each segment, except the cephalic and two anal segments; the tracheæ forming two distinct networks. In *Lithobius* there are six pair of stigmata on segments 3, 5, 8, 10, 12, and 14; in *Cryptops* and *Scolopendra*, 9 pairs on these segments and segments 16, 18, and 20. In *Scolopendra* the tracheæ anastomose, and form a single network; in the other two genera there are two networks.

Heathcote (15) describes an auditory organ in *Scutigera*.

Tömösváry (24) describes the secreting glands of the ventral surface of *Geophilus*.

Gaffron (9) describes the reproductive organs of *Peripatus edwardsii*.

Richard (19) describes the phosphorescence of *Scolioplanes crassipes*, Koch.

Haacke, W., (11) notes that an Australian species of *Scutigera* uses its long legs to form a trap to catch flies.

New Genus.

Cermatobius, Haase, (13) p. 693.

New Species.

Cermatobius martensii, Haase, (13) p. 693.

Lithobius oligophorus, Latzel (Costa), (6), from Sardinia, p. 240.

Scolopendra flavicornis, variispinosa, aurantipes, from Borneo, p. 67, *nudipes*, from Singapore, p. 67, Tömösváry, (25).

Branchiotrema nitidulum, *longicorne*, from Borneo, p. 66; *compl*
Branchiostoma subspinosum, *punctiventre*, from Borneo, p. 66; *id.* (25).
Heterotoma albidum, from Singapore, p. 65, *bisulcatum*, from Borneo, p. 65; *id.* (25).
Scolopocryptops geophilicornis, from Java, p. 65; *id.* (25).
Mecistocephalus sulcicollis, from Borneo, p. 64; *id.* (25).
Orya xanti, from Borneo, p. 64; *id.* (25).
Sphæropæus falcicornis, *granulatus*, from Borneo, p. 68; *id.* (25).
Oxyurus rosulans, from Japan, p. 69; *id.* (25).
Spirobolus rufo-marginatus, p. 69, *erythropus*, p. 70, *ater*, p. 70, from Borneo; *id.* (25).
Craspedosoma packardii, Stuxberg, (23) p. 693.
Siphonophora quadrituberculata, from Borneo, p. 73; Tömösvary (25).
Peripatus balfouri, Sedgwick, (21), from the Cape.
Haase (12) describes, but does not name, a new parasite on *Julus*, allied to *Oestridæ* and *Phoridæ*.

Distribution.

Carlini (3) has found *Geophilus maxilaris*, Gervais, in the island of S. Pietro, off Sardinia. Costa (6) mentions a new species, *Lithobius oligoporus*, from Sardinia.

Cragin (7) gives a list of 12 species from Kansas.

Feiles (8) finds *Brachypauropus hamiger*, Latzel, in Austria.

Haase (14) describes the *Symphyla* and *Pauropoda* of Schleswig.

Tömösváry (25) describes species of Myriopods, 20 new, from Eastern Asia.

INSECTA.

COLEOPTERA, HYMENOPTERA, LEPIDOPTERA, DIPTERA, RHYNCHOTA.

By D. Sharp.

As the system, used in previous volumes, of arrangement of the titles of memoirs has not proved so advantageous in facilitating reference as was anticipated, and as it had the disadvantage of compelling search in a number of widely-separated pages, it has been decided that a change in this respect may be introduced. Accordingly, the titles of memoirs in the orders recorded by me are here placed together. This list of titles is, however, far from being exhaustive. The titles of small notes are not included; in many cases, when the whole contents of a memoir are recorded piecemeal in the systematic portion of our Record, the title is omitted, and sometimes, when the subject treated is very restricted, the title itself is placed in the systematic record. The chief difficulties experienced have been in regard to synonymy and to varietal names. As to the former, I think it is much to be desired that writers when introducing a new synonym should accompany it by some distinctive mark, such as "n. syn." As to varieties, I have included some new varietal names, but others are passed over without notice.

It is with much pleasure that I am able to preface my portion of the Record by an expression of thanks to my predecessor, Mr. W. F. Kirby, for the kind manner in which he has communicated information about several matters to me.

D. S.

I.—TITLES.

1. Aaron, S. F. The North American *Chrysididæ*. Tr. Am. Ent. Soc. xii. pp. 209–248, pls. vi.–x.

A systematic monograph of the N. American members of this family of *Hymenoptera*, with analytical tables of genera and species. The synonymy given in it is not reproduced.

2. Abeille, E. de Perrin. Nouveaux documents pour servir à l'histoire des *Malachides*. [*Coleoptera.*] Rev. d'Ent. iv. pp. 4–28.

The more important of these observations are recorded in the systematic part of our Record; but the memoir contains also numerous minor observations of value.

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The more important of these observations are recorded in the systematic part of our Record; but the memoir contains also numerous minor observations of value.

3. Adolph, E. Die Dipterenflügel, ihr Schema und [illegible]. Nova Acta Ac. L.-C. Nat. cur. xlvii. pp. 271–314, pls. xxiv.–xx[illegible].

This is one of a series of memoirs on the wings of Insects, the corresponding memoir on the wing of *Hymenoptera* being referred to in Zool. Rec. xxi. *Ins.* p. 126, the object being in each order to obtain a typical wing, "Flügelschema"; the types so obtained to be afterwards compared. The present paper is the attempt to deal homologically with the wing in numerous families of *Diptera*, and the plates represent wings of 46 different species with the veins classified by means of colours and dotted lines.

4. Allard, E. Classification des Adesmides et des Mégagénides. [*Coleoptera.*] Ann. Soc. Ent. Fr. (6) v. pp. 154–208.

Consists of analytical tables for the determination of the genera and species, followed by diagnoses which for the most part are those given by the author who first described such species. Few novelties.

5. Amans, P. C. Comparaisons des organes du vol dans la série animale. Ann. Sci. Nat. (6) xix. Art. 2, pp. 1–219, pls. i.–viii.

This is primarily an entomological paper, 184 pp. and all the plates being devoted to the *Insecta*. Most of the orders are dealt with in more or less detail, and one of the chief aims of the author appears to be the establishment of an orismology homologically applicable to all the orders. Considerable attention is given to the muscular system; the plates are chiefly magnified representations of the articulations and connections between the base of the wing and the thorax.

6. Ashmead, W. H. A Bibliographical and Synonymical Catalogue of the North American *Cynipidæ*, with Description of New Species. Tr. Am. Ent. Soc. xii. pp. 291–304.

This also includes a list of the trees and plants on which these N. American *Hymenoptera* have been found.

7. ——. On the Cynipidous Galls of Florida, with Descriptions of New Species. Month. P. Am. Ent. Soc. xii. pp. v.–ix.

8. ——. Studies on N. American *Chalcididæ*, with Descriptions of New Species from Florida. *T. c.* pp. x.–xix. [*Hymenoptera.*]

9. Atkinson, E. T. Notes on Indian *Rhynchota*. No. 1, J. A. S. B. liii. pp. 210–233; No. 2, *op. cit.* liv. pp. 1–23; No. 3, *t. c.* pp. 75–117; No. 4, *t. c.* pp. 127–158.

These parts are devoted to *Homoptera*, and consist chiefly of transcriptions of descriptions of E. Indian species, with a few novelties.

10. ——. The Himalayan Districts of the North-Western Provinces of India. Vol. II. (forming vol. xi. of the Gazetteer N. W. P.). Allahabad: 1884.

Pp. 96–264 of this work are devoted to Insects, and a catalogue of the species proper to the district is given, but is compiled chiefly from old works. Rather more trouble has been taken with the *Lepidoptera* than with the other orders.

11. Aurivillius, C. Das Insekten leben in arktischen Ländern. In Nordenskiöld's Studien und Forschungen veranlasst durch meine Reisen im hohen Norden. Leipzig: 1885, pp. 387–439.

A summary of the present condition of knowledge as to arctic entomology, with table of geographical distribution and generalizations on this subject. The question of the relations of insects to flowers is dealt with in an extended manner, with the object of ascertaining what agreement there is between the distribution towards the north of insects and flowers. [For extract, *vide* Ent. M. M. xxi. p. 271.]

12. ——. Conspectus generum et specierum Brachyceridarum (*Col.*). Œfv. Ak. Förh. 1885, No. 7, pp. 5–24.

2 new genera and about 24 new species are described. The treatment of *Brachycerus* is postponed.

13. Baker, G. T. Descriptions of some New Species of *Lepidoptera* from Algeria. Ent. M. M. xxi. pp. 241–245 & 268–270.

13 spp. & var. nn. of *Rhopalocera* and *Heterocera*.

14. Balbiani, E. G. Contribution à l'étude de la formation des organes sexuels chez les insectes. Rec. Z. Suisse, ii. pp. 527–588, pls. xvi*bis* & xvii.

The writer studied the formation of the internal sexual organs in the egg of *Chironomus* sp. (*Diptera*). He commences with a historical introduction, and then details his observations on the development of the organs in question, beginning with the newly-deposited egg, the observations being continued till the larva was a few days old. In a third part, pp. 578–588, he gives a *résumé* and reflections, concluding with a reference to the important question of the relation between the formation of the sexual organs and the phenomena of heredity. The plates represent sections of the egg in progressive stages of development, and the young larva, and the sexual cells and genital glands.

15. Baly, J. S. The Colombian Species of the Genus *Diabrotica* [*Coleoptera*], with Descriptions of those hitherto uncharacterized. Part i. J. L. S. xix. pp. 213–229.

37 species are mentioned, of which no less than 28 are new; the variations of several previously described species are noticed.

——. [See also Godman & Salvin.]

16. Bankes, E. A. [assisted by the Rev. C. R. Digby]. *Lepidoptera* of the Isle of Purbeck. P. Dors. N. H. vi. pp. 128–177, pl. xi.

Extends throughout the order, and includes 879 species. The plate is devoted to *Tineidæ*.

17. Bargagli, P. Rassegna biologica di Rincofori europei. [Continuation.] Bull. Ent. Ital. 1885, pp. 3–50 & 293–350.

This is a compilation of observations of the habits of the perfect insects and larvæ of the *Curculionidæ*. These instalments carry the work as far as the genus *Rhyncolus*.

18. Barthélemy, A. Études sur la tête et la bouche des larves d'Insectes. C.R. c. pp. 121-124.

"This note shows that there exists in insects a general larval form, the caterpillar, whose mouth approximates to the appendages of the Nauplius form."

Bates, H. W. [See Godman & Salvin.]

19. Bedel, L. Faune des Coléoptères du bassin de la Seine et de ses bassins secondaires. ii. pp. 145–200, published in connection with Ann. Soc. Ent. Fr. (6) iv. & v. [separate pagination, and includes *Mecinus* to *Nanophyes*].

Many amalgamations and rearrangements of European genera are proposed in this work.

20. ——. Recherches sur les Coléoptères du nord de l'Afrique. Recherches synonymiques. *Op. cit.* v. pp. 85–90. [*Cf. op. cit.* iv. p. 222.]

21. Beling, T. Beitrag zur Biologie einiger Käfer aus der Familie der Telephoriden. B. E. Z. xxix. pp. 350–362.

Deals with the larvæ of 11 species of *Cantharis* and 1 *Malthodes*.

22. Belon, M. J Histoire Naturelle des Coléoptères de France. Ann. Soc. L. Lyon (n.s.) xxxi. pp. 61–212. [Also published separately.]

This contains the second part of the family *Lathridiidæ*, and forms a portion of Mulsant and Rey's well-known series. The work is very carefully executed. No new genera or species are described. [Reviewed by Reitter, Wien. ent. Z. iv. p. 159.]

23. ——. Matériaux pour servir à l'étude des *Lathridiens*. [*Coleoptera.*] Rev. d'Ent. iv. pp. 239–254.

24. Bergé, A. Enumeration des Cétonides décrits depuis la publication du Catalogue de MM. Gemminger et de Harold. [*Coleoptera.*] Ann. Ent. Belg. xxviii. pp. 113–163.

25. ——. Note pour servir à la monographie du genre *Agestrata*. [*Coleoptera.*] *Op. cit.* xxix. 2, pp. 11–14.

26. ——. Note sur la coloration chez les Insectes et specialement chez les Coléoptères. C.R. ent. Belg. 1885, p. c. & cxiii.

The colours are said to be due to the superposition of layers of pigment.

27. °Bessler, J. G. Geschichte der Bienenzucht, ein Beitrag zur Kulturgeschichte. Ludwigsburg: 1885, 8vo, pp. iv. & 275. [*Cf.* Ent. Nachr. xi. p. 347.]

28. Beyerinck, M. W. Die Galle von *Cecidomyia poæ* an *Poa nemoralis*. Entstehung normaler Wurzeln in Folge der Wirkung eines Gallenthieres. Bot. Z. xliii. pp. 306 & 321, pl. iii. [*Diptera.*] [*Cf.* Kosmos, xvii. p. 140.]

29. Bigot, J. M. F. Diptères nouveaux ou peu connus. 27e partie. xxxv. Famille des *Anomalocerati* (*Coriacæ*, *Pupipara*, *Nycteribidæ*, auct.). Ann. Soc. Ent. Fr. 6 (v.) pp. 225–246.

The earlier pages of this memoir are devoted to some considerations

as to the classification of the *Diptera*. The author proposes to divide the order into two tribes, *Omalocerati* and *Anomalocerati*; this latter is divided into *Zoobiæ*, *Melitobiæ*, and *Nycteribiæ*; these the author also styles tribes, and divides into "curies," these latter being again divided to arrive at genera. In the table of the genera forming the "curie" *Zoobidi*, a considerable amount of generic synonymy is introduced. [*Cf.* Mik, Wien. ent. Z. v. pp. 79 & 80, who decides that this system is "eine nomenclatorische Spielerei."]

30. [Bigot, J. M. F.] Diptères nouveaux ou peu connus. 25e partie. *Anthomyzides* nouvelles. *Op. cit.* iv. pp. 263–304.

31. ——. Diptères nouveaux ou peu connus. 26e partie. Genre *Glossinia*. *Op. cit.* v. pp. 121–124.

32. ——. Diptères nouveaux ou peu connus. 28e partie. xxxvi. *Syrphidi*. *T. c.* pp. 247–252.

33. ——. *Dexiidæ.—Sarcophagidæ*. Essai d'une classification générale et synoptique des genres assignés présentement à ces deux groupes d'insectes Diptères. Rev. d'Ent. iv. pp. 255–269.

These two groups are only provisionally admitted as distinct, the first from the "Tachinaires and Muscides," the second from the "Muscides," p. 255. Some preliminary explanations are given, pp. 256–259, and the rest of the memoir is devoted to tabulation of the genera, one genus being presumably new.

34. Blackburn, T., & Sharp, D. Memoirs on the *Coleoptera* of the Hawaiian Islands. Tr. R. Dublin Soc. (2) iii. pp. 119–300, pls. iv. & v.

Consists of three memoirs: 1, descriptions of new genera and species; 2, a systematic catalogue of the *Coleoptera* of the Archipelago, so far as yet known; 3, a topographical table, showing the distribution in the Archipelago, with summary, generalizations, and comments (this is by Sharp alone). A description of the Archipelago, from an entomological point of view, is given by Blackburn as an appendix to Part 1. (pp. 197–208). 150 genera are recorded, comprising 428 species, 99 of the genera and 352 of the species being peculiar to the Archipelago. Sharp's comments (pp. 263–274) are not amenable to condensation; but on pp. 272 & 273 he calls attention to the extreme importance of the study of the organic products of remote islands, and the importance of the speedy acquisition of specimens for this purpose, owing to the rapid extinction that is going on.

35. Blanchard, F. On the Species of *Canthon* and *Phanæus* of the United States, with Notes on other Genera (*Platyceras*, *Chæridium*, *Copris*, *Hoplia*, *Allorhina*, *Euphoria*). [*Coleoptera*.] Tr. Am. Ent. Soc. xii. pp. 163–172.

36. Bott, P. Ueber die Entstehung der Bienenzellen. Kosmos, xvi. pp. 52–60.

A summary of the views of Müllenhoff published in 1883.

37. Bourgeois, J. Faune gallo-rhénane. Vol. iv.

Pp. 61–100 of this work have been published in connection with Rev. d'Ent. iv., and comprise *Lycini* (pt.), *Lampyrini*, *Drilini*, and commencement of *Cantharini* [*Coleoptera*].

38. ——. Remarques sur le genre *Dasytiscus*, et descriptions d'espèces nouvelles ou imparfaitement connues. Ann. Soc. Ent. Fr. (6) v. pp. 253–271, pl. v. [*Coleoptera.*]

20 species known to the author are diagnosed or described, and the characters of the genus are passed under review.

39. ——. Description d'un genre nouveau et d'une espèce nouvelle de Malacodermes de la faune paléarctique. *T. c.* pp. 272–274, pl. v. fig. 5. [*Coleoptera.*]

40. ——. Diagnoses de Lycides nouveaux ou peu connus; 5e partie. *T. c.* pp 71–84. [*Coleoptera.*]

41. Branden, C. van den. Catalogue des Coléoptères carnassiers aquatiques [*Haliplidæ*, *Amphizoidæ*, *Pelobiidæ*, and *Dytiscidæ*]. Ann. Ent. Belg. xxix. pp. 5–115.

Enumerates 75 species of *Haliplidæ*, 4 of *Amphizoidæ*, 4 of *Pelobiidæ*, and 1543 of *Dytiscidæ*, the arrangement of the latter being taken from Sharp's work "On *Dytiscidæ*."

42. Brauer, F. Systematisch-zoologische Studien. SB. Ak. Wien, xci. pp. 237–413, 1 pl.

These studies consist of three parts :—1. "System und Stammbaum"; this is only in slight part entomological. 2. "Die unvermittelten Reihen in der Classe der Insecten," pp. 273–384; this is a contribution to an improved, or more modern classification of the class *Insecta*; at p. 383, is a key to its contents. 3. "Betrachtungen über täuschende und wahre systematische Ähnlichkeiten zur Beurtheilung der Stellung der Apioceriden und Pupiparen, und über den Werth der alten und neuen Eintheilung der Dipteren," pp. 385–413; the plate illustrates some cases of "mimicry," referred to at the commencement of this third memoir. [For summary of contents of this paper, see Wien. ent. Z. v. pp. 28–30; and for review, Packard, A. S., "Dr. Brauer's Views on the Classification of Insects," Am. Nat. xix. pp. 999–1001.]

43. Briant, S. J. Notes on the Antennæ of the Honey Bee. J. L. S. xix. pp. 84–88, woodcuts.

A description of the internal and external anatomy of these organs; no opinion as to their function is offered except that "the hooked hairs at the end of the antennæ are active sense organs, and that the other organs are passive."

44. Brischke, C. G. A. Nachtrag zu den Beobachtungen über die Blatt- und Holzwespen. [*Hymenoptera.*] Schr. Ges. Danz. (2) vi. pp. 243–251, pl. i.

One new *Nematus* is described, and several larvæ (some unnamed) are figured.

reproduced by, C. G. A.] Meine erzogenen parasitisch lebenden Fliegen. *T. c.* pp. 15-22.

A list of the *Diptera* bred by him from *Lepidoptera*, with descriptions of 9 new species of *Tachina*.

46. Brongniart, C. Les insectes fossiles des terrains primaires, coup-d'œil rapide sur la faune entomologique des terrains paléozoiques. Bull. Soc. Rouen, 1885, pp. 50–68, pls. i.–iii.

Refers chiefly to *Orthoptera* and *Neuroptera*, or approximations thereto, many new names being given. A few *Homoptera* are mentioned, p. 67. [A translation is published under the title, "The Fossil Insects of the Primary Rocks," in Geol. Mag. (3) ii. pp. 481–490, and a note on the memoir in P. E. Soc. 1885, p. xi.]

47. Broun, T. Abstract of Paper on New Zealand *Scydmænidæ* [read before the Auckland Institute, Oct., 1884]. N. Z. J. Sci. ii. pp. 384 & 385. [*Coleoptera.*]

Includes, besides 5 species of *Scydmænidæ*, others of numerous different families.

48. Buddeberg, —. Beiträge zur Biologie einheimischer Käferarten. JB. nass. Ver. xxxviii. pp. 81–110.

Contributions to a knowledge of the life-histories and metamorphoses of 16 species of various families.

49. Burmeister, H. Revision der Gattung *Eurysoma*. [*Coleoptera.*] S. E. Z. xlvi. pp. 321–333.

The use of the name *Eurysoma* (Gistl.) in place of *Brachygnathus* (Perty) is proposed, and on accompanying plate (not numbered) the trophi are figured. The characters of the genus are amply detailed, and all the species described or commented on. Sharp, *t. c.* p. 401, however, upholds the name *Brachygnathus*.

50. Butler, A. G. Descriptions of Moths new to Japan, collected by Messrs. Lewis & Pryer. Cist. Ent. iii. pp. 113–136.

35 species.

51. ——. On a Collection of *Lepidoptera* made by Major J. W. Yerbury, at or near Aden. P. Z. S. 1884, pp. 478–503, pl. xlvi.

42 species of *Rhopalocera*, 49 of *Heterocera*. We have reproduced nearly all the synonymy given in this paper.

52. ——. On *Doratopteryx* of Rogenhofer, a Genus of Moths allied to *Himantopterus*. Ann. N. H. (5) xvi. pp. 51 & 52.

The differential characters are sketched, and the systematic position is said to be in the *Chalcosiidæ*.

53. ——. On the Blue-Belted species of the Butterfly Genus *Prothoe*. *T. c.* pp. 52–54.

3 new species.

54. [Butler, A. G.] *Lepidoptera* collected by Mr. C. M. Rev. in the Ellice and Gilbert Islands. *Op. cit.* xv. pp. 238–242.

2 *Rhopalocera* and 14 *Heterocera* are mentioned, 1 genus and 2 species of the latter new. On pp. 414–416 of the same work will be found additional remarks on these species by Mr. Woodford.

55. ——. On a Collection of *Lepidoptera* made at Manipur, and on the Borders of Assam, by Dr. Geo. Watt. *Op. cit.* xvi. pp. 298–310 & 334–347, pl. viii.

114 species of *Rhopalocera* and 14 of *Heterocera* are mentioned. The novelties are few.

56. Camboué, le R. P. Bombyciens sèricigènes de Madagascar. Bull. Soc. Acclim. (4) ii. pp. 367–374.

Gives some additional information about *Borocera madagascariensis* and *Saturnia suraka*. The Malgaches prefer the silk of *Sericaria mori* to that of their indigenous silkworms.

57. Cambridge, O. P. On *Hypena obsitalis*, Hüb., a Deltoid Moth new to Britain. P. Dors. N. H. vi. p. 70, pl. iii.

58. ——. *Lycæna argiades*, Pall., a Butterfly new to the British Fauna. Ent. xviii. pp. 249–252, woodcuts.

59. Camerano, L. Osservazioni intorno alla neotenia negli insetti. Bull. Ent. Ital. 1885, pp. 89–94.

This paper is summarised at its termination by a series of seven theses, the most important of which are—3°, that the reproduction of the individual in the larval period may be considered a case of neotenia analogous to that of the *Amphibia*; and 6°, that in the classification of insects, metamorphosis should occupy a rank secondary to the morphological and embryological characters.

60. ——. Ricerche intorno alla distribuzione dei colori nel regno animale. Mem. Acc. Tor. (2) xxxvi. pp. 329–360, pls. i. & ii.

The entomological portions of this memoir are largely general statements, incapable of summary. The first plate is chiefly entomological, the second is an attempt to gauge the predominance of certain colours in the animal kingdom.

61. ——, & Lessona, M. Compendio della fauna italiana. Turin. [*Insecta*, pp. 201–276.]

62. Cameron, P. A Monograph of the British Phytophagous *Hymenoptera*. Vol. ii., being the Ray Society volume for the year 1884; 8vo, 240 pp. and 27 pls.

This volume is devoted to the *Nematina*, 7 genera of the tribe being adopted as British, viz., *Hemichroa*, *Dineura*, *Cladius*, *Camponiscus*, *Craesus*, *Nematus*, *Euura*. Tables of the genera and species are given, in addition to the detailed descriptions, and the geographical distribution is given in some detail. There is also an appendix, containing some additions and corrections to vol. i. The volume will be a necessity to serious students of the *Tenthredinidæ*, and the synonymy it contains will not be

reproduced here. Of the twenty-seven plates, seven are devoted to the perfect insects, and details of their structure, six to the earlier stages, thirteen to outlines of the saws of the female, and one to details of larval structure and of tenthredinous galls. A portion of the plates refer, however, to tribes that remain to be dealt with systematically in another volume.

63. [Cameron, P.] On the Origin of the Forms of Galls. P. N. H. Soc. Glasg. (n.s.) i. pp. 28–37.

The poison theory of Lacaze-Duthiers is rejected, and a theory of protection suggested.

64. ——. Synopsis of the British Species of *Cimbicidina*, *Hylotomina*, *Lophyrina*, and *Lydina*. [*Hymenoptera*.] Ent. M. M. xxii. pp. 47–51, 83–85, & 117–123.

——. [See also Godman & Salvin.]

65. Carlini[illegible]e. Artropodi dell' isola di S. Pietro. Bull. Ent. Ital. 1885, [illegible]–196.

This list is no doubt very incomplete, as it comprises only 44 species of *Insecta*, while no less than 19 species of *Arachnida* are enumerated.

66. *Carrière, J. Die Sehorgane der Thiere, vergleichend anatomisch dargestellt. München und Leipzig-Oldenbourg: 1885.

[*Cf.* Biol. Centralbl. v. pp. 589–597, where the recent memoirs of Viallanes, Ciaccio, and Hickson are noticed under the heading, "Einiges über die Sehapparate von Arthropoden."]

67. Casey, T. L. New Genera and Species of Californian *Coleoptera*. Bull. Cal. Ac. Sci. i. pp. 283–336, pl.

Deals chiefly with *Staphylinidæ*. The plate is not numbered.

Champion, G. C. [See Godman & Salvin.]

68. Chatin, J. Recherches sur la constitution de la mandibule chez les Coléoptères et les Orthoptères. Bull. Soc. Philom. (7) ix. pp. 33–36.

Some generalizations as to the rational structure of the mandible in a few *Orthoptera* and *Neuroptera*. The only reference to *Coleoptera* is three lines devoted to *Carabus auratus*. [*Cf.* Bull. Ent. Ital. 1885, p. 169.]

69. ——. Sur les modes de terminaison des nerfs dans la trompe des Lépidoptères. *T. c.* p. 131.

70. ——. Morphologie analytique et comparée de la mâchoire chez les Hyménoptères. C.R. ci. pp. 259–261.

Points out briefly the modifications of the maxilla existing in different *Hymenoptera*, and its similarity to that of the mandibulate insects. A similar note on the mandible of *Hymenoptera* is given by Chatin, *t. c.* p. 642.

71. Chauzit, B. État actuel de la question du *Phylloxera* en France. Paris: 8vo, 320 pp.

A popular manual intended for the use of those economically interested.

72. Cheshire, F. R. The Apparatus for Differentiating the Sexes in Bees and Wasps. An anatomical investigation into the structure of the receptaculum seminis and adjacent parts. J. R. Micr. Soc. (2) v. pp. 1-15, pls. i. & ii.

The observations and reasoning in this memoir are of much interest, but do not admit of summary.

73. Chevrolat, A. Calandrides : nouveaux genres et nouvelles espèces, observations, synonymies, doubles emplois de noms de genres et d'espèces, &c. 2e partie. [*Coleoptera.*] Ann. Soc. Ent. Fr. (6) v. pp. 91-112.

This is a posthumous work, for first part of which *cf. op. cit.* 1882, edited by Jekel, who makes some introductory remarks and criticisms, pointing out specially that the genus *Sphenophorus*, after the dismemberments made from it by the author, is in need of limitation and definition.

74. Cholodkovsky, N. Ueber den Geschlechtsapparat von *Nematois metallicus*, Pod. [*Lepidoptera.*] Z. wiss. Zool. xlii. pp. 559-568, pl. xix.

The number of ovarian tubes in this species is increased to twenty. The sexual structures of the female indicate a lower stage of evolution than in other *Lepidoptera*. Description of peculiarities of structure in the external parts, ♀. Existence of an undoubted ovipositor (*Tineola biselliella*, Humm. possesses one of still higher organization). The number of vesiculæ seminales in the ♂ is apparently correlated with that of the ovarian tubes of the female. The increase in the number of the vesiculæ seminales is of much importance, as indicating a link to the *Phryganidæ*. Description of outer parts of the ♂. A natural nomenclature of these parts is urgently required, that of Burgess (for *Danais archippus*) commended. Need of fresh investigations as to "*Micro-Lepidoptera*," which may result in the breaking up of the group. These are the chief points of this suggestive memoir. A few other insects are mentioned, especially *Sesia scoliiformis* and *S. hylæiformis* ; and in respect to *Carabus*, he says that he has found important individual variations in the number of the ovarian tubes in different species.

Christoph, H. [See Romanoff.]

75. Ciaccio, G. V. Figure dichiarative della minuta fabbrica degli occhi de' Ditteri disposte ed ordinate in xii. tavole. Mem. Acc. Bologn. (4) vi. pp. 45-72, 12 pls.

This memoir consists of twelve plates of greatly-magnified representations of sections of the eye in various families of *Diptera*, in all 173 figures. The letterpress consists of the explanations of plates and a brief prefatory note.

76. Ciccone, A. Delle Macchie e dei corpuscoli che s'incontrano in alcune malattie del Baco da Seta. Atti Ist. Nap. (3) iv. No. 12, pp. 1-33.

This and the following paper being only indirectly entomological, it is sufficient to mention their titles. The above discusses at length the different theories as to the nature of the disease so fatal to silkworms.

77. [Ciccone, A.] Su' risultamenti ottenuti dall' osservazioni sulle macchie e su corpuscoli del Baco da Seta. Atti Ist. Nap. (3) iv. No. 13, pp. 1–5.

78. Claus, C. Elementary Text-Book of Zoology: General Part, and Special Part *Protozoa* to *Insecta*. Translated and edited by Adam Sedgwick, with the assistance of F. G. Heathcote. London: 1884.

Pp. 521–599, with numerous woodcuts, are devoted to the *Hexapoda* = *Insecta*.

79. Colenso, W. A Description of some newly-discovered New Zealand Insects, believed to be new to science. Tr. N. Z. Inst. xvii. pp. 151–160.

Includes 5 *Orthoptera*, 1 *Neuropteron*, and 2 *Hymenoptera*.

80. Constant, A. Notes sur quelques Lépidoptères nouveaux. Seconde partie. Ann. Soc. Ent. Fr. (6) iv. pp. 251–262, pl. x.

Descriptions of numerous *Micro-Lepidoptera*.

81. ———. Notes sur quelques Lépidoptères nouveaux. 3e et dernière partie. *Op. cit.* v. pp. 5–16, pl. i.

82. Costa, A. (Reproduction of diagnoses of new species, from his second Memoir sulla Geofauna Sarda, will be found in Bull. Ent. Ital. 1885, pp. 240–255.)

83. Cuni, Miguel. Excursion entomológica á varias localidades de la provincia de Gerona (Cataluña). An. Soc. Esp. xiv. pp. 51–73.

Contains lists of the insects (of most of the orders) found in this locality.

84. Curley, E. A. Bees and other Hoarding Insects, their specialization into Females, Males, and Workers. Ent. Am. i. pp. 61–72.

Entirely speculative, but interesting.

85. Curò, Antonio. Saggio di un Catalogo dei Lepidotteri d'Italia. Parti Prima: *Rhopalocera*, *Heterocera* (*Sphinges*, *Bombyces*). Florence: 1885.

This is a second edition of the work published in Bull. Ent. Ital. 1875, under the same title. [*Cf.* Bull. Ent. Ital. 1885, p. 356.]

86. Dalla Torre, C. W. Die hymenopterologischen Arbeiten Prof. Dr. Arn. Försters. Bibliographische Studie. JB. Ges. Graub. xxviii. pp. 44–57.

This paper is followed, pp. 57–82, by diagnoses of 132 species, reprinted from No. 9 of the Bibliography, viz., Ein Tag in den Hochalpen. . . . Aachen, 1861.

87. Dalla Torre, K. W. Die Duftapparate der Schmetterlinge. Kosmos, xvii. pp. 354–364 & 410–423.

This is a summary of the present state of knowledge of the presumed fragrant organs of *Lepidoptera*, and concludes with a list of 50 memoirs on the subject.

88. Davison, Jas. On the Influences of some Conditions on the Metamorphosis of the Blow-fly (*Musca vomitoria*). J. Anat. Phys. xix. pp. 150–165.

Six experiments were performed to test the influence of heat, light, its blue rays, and darkness.

89. Desbrochers des Loges. Insectes Coléoptères du Nord de l'Afrique nouveaux ou peu connus. II. Curculionides. 1884, 8vo, 101 pp.

My copy of this memoir is marked "Extrait du Bulletin de l'Académie d'Hippone." [Recorded from séparate copy.] There is an Appendix, with new species of other families.

90. Dewitz, H. Weitere Mittheilungen über das Klettern der Insecten an glatten senkrechten Flächen. Zool. Anz. viii. p. 157.

Maintains that this function is accomplished by means of a secretion. [*Cf.* Mik, Wien. ent. Z. iv. p. 254.]

91. Distant, W. L. Rhopalocera Malayana, pts. viii.–x. pp. 249–364, pls. xxv.–xxxii.

Extends as far as *Papilio*, part. Varied by many discursive notes.

92. Dokhtouroff, W. Faune Coléoptèrologique Aralo-Caspienne. I. partie : Cicindelides. Hor. Ent. Ross. xix. pp. 245–281, pl. xi.

Lengthy descriptions of known species, with a few new, and a beautiful plate. 30 species are dealt with. The names of the varieties and previously-described species, or the synonymy given in this paper, are not recorded.

93. Doncbel, H. Donckier de. Premiers états de quelques Cassides exotiques. [*Coleoptera.*] Ann. Ent. Belg. xxix. pp. 158–162, pl. i.

94. Druce, H. Descriptions of New Species of *Lepidoptera Heterocera*, chiefly from South America. P. Z. S. 1885, pp. 518–536, pls. xxxii. & xxxiii.

——. [See also Godman & Salvin.]

95. Dumaine, C. J. The Tusser Silk Worm (*Antheræa paphia*, L.), and how I reared it at Burhee, in the Hazareebagh District. J. Agric. Soc. Ind. vii. pp. 268–278.

96. Duvivier, A. Phytophages exotiques. [*Coleoptera.*] S. E. Z. xlvi. pp. 241–250 & 385–400.

1 g. n. and 24 spp. nn.

97. Emery, C. La luce della *Luciola italica* osservata col microscopio. Bull. Ent. Ital. 1885, pp. 351–355, pl. v.

The light of the living insect was examined, and the appearances are represented on the plate. The author is now of opinion that the parenchymal cells are the seat of the light.

98. Eppelsheim, E. Beitrag zur Staphylinen Fauna West Afrikas. [*Coleoptera.*] Deutsche e. Z. xxix. pp. 97–147.

Most of the species recorded are described as new.

Erschoff, N. [See Romanoff.]

99. Fabre, J. H. Étude sur la répartition des sexes chez les Hyménoptères. Ann. Sci Nat. (6) xvii. Art. 9, pp. 53.

100. Fairmaire, L. Liste des Coléoptères recueillis à la Terre de Feu par la Mission de la Romanche, et description des espèces nouvelles. Ann. Soc. Ent. Fr. (6) v. pp. 33–62.

Consists of 62 species. He considers that, although the fauna is poor, it possesses some special genera characteristic of a region now disappeared, apparently comprehending the Falkland Islands and Southern Georgia. Some *Heteromera* of the group *Helopides* are considered in particular to support this view. The collection was made by Drs. Hyades and Hahn. Diagnoses of certain of the genera and species previously appeared in Le Naturaliste, 15th January, 1885, pp. 11 & 12. A considerable number of genera and species previously described by other authors are noticed or re-described at greater or less length. Some of the species included in the list were not seen by Fairmaire himself. In the island of Southern Georgia only 3 species of *Coleoptera* could be detected by the German Mission during a ten months' residence in 1822–3.

101. ——. Note sur les Coléoptères recueillis par M. Ach. Raffray à Madagascar, et descriptions des espèces nouvelles. *Op. cit.* iv. pp. 225–242 (1re partie).

Describes many novelties of various families.

102. Faust, J. Neue asiatische Rüsselkäfer (aus Turkestan); iii. [*Coleoptera.*] Deutsche e. Z. xxix. pp. 161–190.

30 species are described; but the paper is specially remarkable on account of its dealing, pp. 164–167, with the classification of the Otiorhynchoid groups of *Rhyncophora*.

103. ——. Turkestanische Rüsselkäfer. S. E. Z. xlvi. pp. 149–202.

Descriptions of a large number of new species.

104. ——. Africanische Rüsselkäfer. Ent. Nachr. xi. pp. 65–76 & 87–95.

Consists of descriptions of a few new species and genera.

105. ——. Neue Rüsselkäfer aus Algerien. B. E. Z. xxix. pp. 233–244.

14 species.

106. Fauvel, —. Faune gallo-rhénane, vol. ii. [*Coleoptera.*]

Pp. 165–196, dealing with a portion of *Bembidium*, of this volume have been published in connection with Rev. d'Ent. iv.

107. Ferrari, P. M. Rincoti omotteri raccolti nell' Italia centrale e meridionale dal Prof. G. Cavanna. Bull. Ent. Ital. 1885, pp. 269–292.

A list of 102 species.

108. ——. *Rhynchota* Tridentina, a March. Jacopo et Laura Doria lecta anno 1884 enumerat. Ann. Mus. Genov. (2) ii. pp. 401–421.

This is entirely a contribution to the Tyrolese fauna; 96 species are catalogued, including both *Heteroptera* and *Homoptera*.

109. *Fletcher, J. Report of the Dominion Entomologist for 1884 (Canada).

110. Forbes, H. O. A Naturalist's Wanderings in the Eastern Archipelago. London: 1885.

This work contains some descriptions and local lists of insects at pp. 274–277, 370–382, & 496. Most of them are reprints, and the originals have been noticed in this or previous vols. of Zool. Rec.; but a few are original.

111. Forel, A. Études myrmécologiques en 1884, avec une description des organes sensoriels des antennes. Bull. Soc. Vaud. xx. pp. 316–380, pl. xi.

These studies consist of two distinct parts. I. is practically a summary, accompanied by criticisms of the recent progress of psychology among the *Hymenoptera*. He notices Lubbock's criticisms of some of his (Forel's) previous observations, in some cases accepting them as valid, in others rejecting them. Fabre's views as to instinct and sense of smell in the *Hymenoptera* are also criticized, and Lubbock's paper (Tr. L. S. 1857) and Kræpelin's (1883) are specially referred to; this latter Forel accepts with cordiality. The plate refers specially to the minute structure of the antennæ. II. consists of descriptions of new species, &c., chiefly from Central America. In some of these descriptions a tetranomial nomenclature is used.

112. ——. Indian Ants of the Indian Museum, Calcutta. J. A. S. B. liv. pt. 2, pp. 176–182.

A list of 26 species, 2 of them new.

113. Fowler, W. W. New Species of *Languriidæ*. Tr. E. Soc. 1885, pp. 381–388. [*Coleoptera.*]

8 species, with a new genus, from Africa, and 1 species from Philippine Islands.

114. Franchet, J. Observations sur le *Bruchus* (*Caryoborus*) *nucleorum* et son développement. [*Coleoptera.*] Bull. Soc. Philom. (7) ix. pp. 11–14, pl. i.

This beetle and its metamorphoses are described and figured.

115. Frenzel, J. Einiges über den Mitteldarm der Insekten, sowie über Epithelregeneration. Arch. mikr. Anat. xxvi. pp. 229–306, pls. vii.–ix.

These observations are the result of an examination of about 60 species, selected as representing the chief families of *Coleoptera*, *Lepidoptera*, and *Hymenoptera*, as well as a few *Diptera*, *Orthoptera*, *Neuroptera*, and *Hemiptera*. The histological structure of the middle tract of the alimentary canal is described at length, and its epithelium specially and very extensively treated of.

116. Frey, H. Zur Kenntniss des Tineen-genus *Elachista*. [*Lepidoptera.*] S. E. Z. xlvi. pp. 97–108.

Contains observations on and comparisons of numerous species, in addition to descriptions of some novelties.

117. *Fricken, W. von. Naturgeschichte der in Deutschland einheimischen Käfer. Vierte Auflage. Werl. 1885. [*Cf.* Ent. Nachr. xi. p. 334.]

118. Fricker, —. Ueber Tötung und Verwendung der Maikäfer. JH. Ver. Württ. xli. pp. 46–48.

A notice of the properties and value of a meal prepared from the Cockchafer; 19½ millions of specimens passed through the mill for the purpose in the year.

119. Gadeau de Kerville, H. Mélanges entomologiques; 3me Mémoire. I. Enumération et description des galles observées jusqû'alors en Normandie, pp. 311–377. Followed by description of some larvæ, &c., pp. 378–388 (recorded in their positions). Bull. Soc. Rouen, 1884.

The arrangement adopted for the galls is an entomological one.

120. Gehin, J. B. Catalogue synonymique et systematique des Coléoptères de la tribu des Carabides. Remiremont, pp. 38 & 103, 10 pls.

This work is of a very unsystematic character. The author, p. xxxviii., informs us that he considers all the numerous genera and subgenera numbered consecutively in it as subgenera of *Carabus*, *Calosoma*, and *Cychrus*, and that he thus exhibits the want of harmony existing amongst entomologists. A large number of named varieties are characterized; these I have not specially noticed. The number of subgenera is of *Carabus* 47, of *Calosoma* 16, of *Cychrus* 5.

121. Gestro, R. Note entomologiche. I. Contribuzione allo studio della Fauna entomologica delle caverne in Italia. II. Materiali per lo studio delle *Hispidæ* Malesi e Papuane. III. Appunti sul genere *Myoderma*. Ann. Mus. Genov. (2) ii. pp. 131–181, pl. iv. Appendice alle Note entomologiche; *t. c.* pp. 531–534. [*Coleoptera.*]

The first of these memoirs, besides the description of novelties, gives figures of and information as to other Italian Anophthalmi, and an account of the caves explored. In the second 40 species are enumerated and the novelties described.

122. Glaser, [Dr.] L. Zur Etymologie und Nomenclatur der Eulen (*Noctuæ*). Ent. Nachr. xi. pp. 197–203, 209–217, 247–254, & 289–303.

Of etymological, not entomological, interest.

123. Godman, F. D. List of the *Lepidoptera* collected by Mr. H. H. Johnston during his Recent Expedition to Kilima-njaro. P. Z. S. 1885, pp. 537–541.

Includes 21 species *Rhopalocera* and 6 *Heterocera*, several new; there is a northern element present, but scarcely a trace of the Abyssinian fauna.

121. Godman, F. D., & Salvin, O. Biologia Centrali-Americana. London.

During 1885 the entomological parts of this work have progressed as follows:—

Lep. Rhopalocera, by Godman & Salvin, vol. i. pp. 361–400, pls. xxxviii.–xli., dealing with a portion of the *Erycinidæ*.

Lep. Heterocera, by Druce, pp. 113–160, pls. xii.–xiv., extending from *Chalcosiidæ* to *Dioptidæ*.

Col., vol. i., pt. 2, by D. Sharp, pp. 393–536, pls. x.–xiii., *Staphylinidæ*, as far as *Lathrobium*.

Col., vol. iii. pt. 2, by H. S. Gorham, pp. 273–312, pl. xii., *Malacodermidæ*.

Col., vol. iv. pt. 1, by G. C. Champion, pp. 89–136, pls. v. & vi., *Heteromera*, as far as *Hopatrides*.

Col., vol. v., by H. W. Bates, completing the *Cerambycidæ*; also *Bruchidæ*, by D. Sharp.

Col., vol. v. pt. 1, by M. Jacoby, pp. 337–408, pls. xx.–xxii., dealing with a portion of the *Halticidæ*.

Col., vol. v. pt. 2, by J. S. Baly, pp. 1–72, pls. i.–iii., *Hispidæ*.

Hymenoptera, by P. Cameron, pp. 145–240, pls. viii.–xi., *Ichneumonides*.

125. Göldi, E. A. Aphorismen neue Resultate und Conjecturen zur Frage nach den Fortpflanzungs-Verhältnissen der Phytophtiren enthaltend. MT. schw. ent. Ges. vii. pp. 158–166.

By an accidental experiment it was found that deprivation of food caused *Pemphigus xylostei* to assume the winged form. Contains also some speculative remarks on parthenogenesis.

126. Gorham, H. S. Revision of the Phytophagous *Coleoptera* of the Japanese Fauna; Subfamilies *Hispinæ* and *Cassidinæ*. P. Z. S. 1885, pp. 280–286.

17 species of the latter, 4 of the former, group are mentioned.

127. ——. Descriptions of some *Endomychidæ* and *Erotylidæ* in the Genoa Civic Museum. Ann. Mus. Genov. (2) ii. pp. 517–530.

Describes 15 new species and 2 new genera of these *Coleoptera*.

——. [See also Godman & Salvin.]

128. Goss, H. On some Recently Discovered *Insecta* from Carboniferous and Silurian Rocks. P. Geol. Ass. ix. No. 3.

A summary of the recent progress of knowledge.

129. Grassi, B. Studi sugli Artropodi. Intorno allo sviluppo delle Api nell' uovo. Atti Acc. Gio. Cat. (3) xviii. pp. 145–222, pls. i.–x.

An important paper. The author was able to follow the development in all its stages, and gives many particulars, in some cases opposed to those of the majority of other authors. The ten quarto plates are crowded with figures. There is also a bibliographical list.

Grumm-Grshimaïlo, —. [See Romanoff.]

130. Grzegorzek, A. Beitrag zur Dipteren-Fauna Galiziens, Kaiserthum Oesterreich. B. E. Z. xxix. pp. 49–79.

This contribution consists of an analytical table of the species of the genus *Sciara*, to the number of 240, several novelties being included.

131. ——. Neue Mycetophiliden. [*Diptera.*] *T. c.* pp. 199–206, pl. ix. A.

132. Hagen, H. A. Die devonischen Insecten. Zool. Anz. viii. pp. 296–301.

133. Haase, Erich. Zur Kenntniss der sexuellen Charactere bei Schmetterlingen. [*Lepidoptera.*] Z. Ent. Bresl. (2) x. pp. 36–43.

Relates chiefly to the structure, functions, and modifications of the tibial spur. He considers that by means of a secretion transferred to the antennæ these organs are assisted in their olfactory function. [*Cf.* Mik, Wien. ent. Z. iv. p. 255.]

134. Hamilton, J. Hibernation of *Coleoptera*. Canad. Ent. xvii. pp. 35–38.

Records immunity of *Coleoptera* from seven days' immersion by a flood. He doubts the correctness of the accepted view that larvæ can be frozen without injury, "having never succeeded in reviving any in which there was absolute certainty of the tissues being frozen."

135. Hammond, A. *Chironomus prasinus*. J. Micr. & Nat. Sci. iv. pp. 65–74 & 165–172, pls. ix. & x. [*Diptera.*]

Contains much anatomical and histological information, as well as figures of the metamorphoses.

136. *Harris, W. H. The Honey-Bee: Its Nature, Homes, and Products. London: 1884. [*Cf.* Nature, xxxi. p. 2.]

137. Henshaw, S. List of the *Coleoptera* of America North of Mexico. Published by the American Entomological Society.

A useful work of about 170 pp., comprising names of 9238 species.

Heylaerts, F. [See Romanoff.]

138. Hickson, S. J. The Eye and Optic Tract of Insects. Q. J. Micr. Sci. xxv. pp. 215–251, pls. xv.–xvii.

A memoir devoted to minute anatomy. The headings of the sections give some idea of the paper, and are as follows:—1, The eye and optic tract of *Musca vomitoria*; 2, The minute anatomy of the optic tract of various insects compared (*Periplaneta*, *Nepa*, *Agrion*, *Noctua*, *Sphinx*, Bee and Wasp, *Æschna*, *Eristalis*); 3, Further remarks upon the histology of the optic tract; 4, The comparative anatomy of the ommateum of the various orders of insects; 5, The distribution of tracheæ to the optic tract and ommateum; 6, historical and critical [in this the received view of Max Schultze and Grenacher that the retinulæ are the end organs of the optic nerves is maintained, and Lowne's view that the true membrane is situated behind the basilar membrane declared incorrect]; 7, Some general considerations upon the eye and optic tract of insects; 8, Methods; 9, Summary. [*Cf.* J. R. Micr. Soc. (2) v. p. 633.]

139. Hoffer, E. Beobachtungen über blütenbesuchende Apiden. Kosmos, xvii. pp. 135–139.

Particulars of the visits of Bees to flowers of *Solanum dulcamara* and *Polygala chamæbuxus*.

140. ——. Neue Hummelnester von den Hochalpen. *T. c.* pp. 291–300.

Particulars of the nests of *Bombus alticola*, *mendax*, and *pomorum* var. *mesomelas*.

141. Holmberg, E. L. Sobre algunos Himenópteros de la República Oriental del Uruguay. An. Soc. Arg. xviii. pp. 201–227.

In addition to descriptions of 13 new species, this paper contains observations on several previously-described species of *Apidæ* and *Vespidæ*. Notices of 3 species of *Ichneumonidæ* are unimportant.

142. Holt, V. M. Why Not Eat Insects? London: 99 pp. [*Cf.* J. Micr. & Nat. Sci. p. 287.]

143. Honrath, E. G. Neue *Rhopalocera*. B. E. Z. xxix. pp. 272–278, pl. viii.

2 new species and several varieties are described.

144. Horn, G. H. Synonymical Notes. [*Coleoptera.*] Ent. Am. i. pp. 5–9 & 52; ii., pp. 88–90; iii., pp. 108–113.

Most of these synonyms will be found in Henshaw's new list (*cf. suprà*) of N. American *Coleoptera*, and need not be given in detail; but I record such as are not noted in that list. It is well, however, to indicate that i. deals with the species described by Newman in the Entomologist, 1840–42, and in the Entomological Mag. v. 1838; that ii. is a reduction, so far as possible, to modern nomenclature of the U.S. *Coleoptera*, described by A. M. J. F. Palisot de Beauvais in the folio entitled, "Insectes recueillis en Afrique et en Amerique, 1805"; that iii. deals with the species recently described by Casey in his "Contributions to the Systematic and Descriptive Coleopterology of the United States," and in the Brooklyn Bulletin. The validity of these latter notes is objected to by Casey, Bull. Cal. Ac. Sci. i. pp. 327 & 333, &c.

145. ——. A Study of some Genera of *Elateridæ*. Tr. Am. Ent. Soc. xii. pp. 33–52. [*Coleoptera.*]

Restricted to the N. American fauna.

146. ——. A Study of the Species of *Cryptobium* of North America. [*Coleoptera.*] *T. c.* pp. 85–106, pl. i.

The species are grouped in accordance with the male secondary characters, and the plate illustrates these peculiarities.

147. ——. Studies among the *Meloidæ*. [*Coleoptera.*] *T. c.* pp. 107–116.

A revision of the North American species of *Macrobasis*, *Epicauta*, *Cantharis*, *Pyrota*, and *Tetranonyx*.

148. ——. Descriptions of New North American *Scarabæidæ*. [*Coleoptera.*] *T. c.* pp. 117–128.

149. [Horn, G. H.] Contributions to the Coleopterology of North America. (No. 4.) *T. c.* pp. 128–161.

A great many novelties belonging to various families are here described.

150. ——. Descriptions of some New *Cerambycidæ*, with notes. *T. c.* pp. 173–197.

151. ——. Synopsis of the *Throscidæ* of the United States. *T. c.* pp. 198–208.

Contains, *inter alia*, valuable information on the sectional characters in these *Coleoptera*.

152. Howard, L. O. Descriptions of North American *Chalcididæ* from the Collections of the U.S. Department of Agriculture and of Dr. C. V. Riley, with Biological Notes. [First Paper.] Together with a list of the described North American species of the family. Bull. Dep. Agric. Ent. No. 5. [*Hymenoptera.*]

The species described and specially alluded to belong to the subfams. *Leucospinæ*, *Chalcidinæ*, *Encyrtinæ*, *Aphelininæ*, *Elachistinæ*, and *Elasminæ*, 52 being thus dealt with. The parasites are in many cases mentioned, and at p. 31 a classified list of these is given. The genera are described. The "List of described North American species" includes also the other subfamilies, and comprises the Mexican species.

153. *Hyatt, J. D. Compound Eyes and multiple Images. J. N. Y. Micr. Soc. i. pp. 33–37.

The structure and function of eyes of various insects are discussed. [*Cf.* Wien. ent. Z. iv. p. 125.]

154. Jacoby, M. Descriptions of New Genera and Species of Phytophagous *Coleoptera* from the Indo-Malayan and Austro-Malayan Subregions, contained in the Genoa Civic Museum. Ann. Mus. Genov. (2) ii. pp. 20–57.

This second part describes 74 species, from *Eumolpidæ* to *Halticidæ*, and some new genera.

155. ——. Descriptions of the Phytophagous *Coleoptera* of Japan, obtained by Mr. Geo. Lewis, Feb. 1880—Sept. 1881; Part i. P. Z. S. 1885, pp. 190–211, pl. xi.

Previously described species are also mentioned.

——. [See also Godman & Salvin.]

156. Jakowleff, W. E. *Hemiptera-Heteroptera* aus Achal-Tekke. Hor. Ent. Ross. xix. pp. 98–129.

This paper is chiefly in Russian, but abbreviated descriptions are given in German of the new genera and species; of the former there are 4, of the latter 15.

157. Janson, O. E. Notices of new or little known *Cetoniadæ*; No. 10. Cist. Ent. iii. pp. 139–152.

15 new species, mostly from Africa.

158. Joseph, G. Ueber Dipteren als Schädlinge und Parasiten des Menschen. Ent. Nachr. xi. pp. 17–22.

Gives details of two cases in which the author extracted larvæ of *Hypoderma diana* and *H. bovis* from living human beings.

159. Judeich, J. F., & Nitsche, H. Lehrbuch der Mitteleuropäischen Forstinsekten-kunde, mit ein Anhange: die Forstschädlichen Wirbelthiere. Als achte Auflage von Dr. J. T. C. Ratzeburg: die Waldverderber und ihre Feinde. 1. Abth. Ratzeburg's Leben. Einleitung. Allgemeiner Theil. (Vienna) pp. 1–264, pls. i.–iii.

This new edition of Ratzeburg's work is to be an altered and improved one. The first division now issued is an introduction, giving such biological information as is considered by the editors to bear on Ratzeburg's subject—the insects injurious to trees. It contains a large amount of well-selected information, amongst which will be found a division (pp. 164–182), in which the fungi destructive to insects are discussed; this division has been supervised by De Bary.

160. Kane, W. F. de V. European Butterflies. London: pp. xxix. & 184, 15 pls.

Intended to enable tourists and others to determine their captures, and will no doubt be very useful to such. The plates are crowded with figures.

161. ——. Variation in European *Lepidoptera*. Naturalist, x. pp. 73–84.

162. Karsch, F. Die Erdlaus: *Tychea phaseoli*, eine neue Gefahr für den Kartoffelbau. [*Rhynchota.*] Ent. Nachr. xi. pp. 353–365 & 369–375.

The writer considers that this insect, known hitherto as more particularly attached to species of *Phascolus*, has suddenly appeared in great numbers as injurious to potatoes, by attacking their roots in one field in Bavaria.

163. Kerremans, C. Enumeration des Buprestides décrits postérieurement au Catalogue de MM. Gemminger et Harold, 1870–83. Ann. Ent. Belg. xxix. pp. 119–157.

The arrangement adopted is completely in conformity with that of the catalogue to which this useful work is a supplement. The number of new species described in the above period is about 873.

164. Kessler, H. F. Beitrag zur Entwickelungs- und Lebens-weise der Aphiden. Nova Acta Ac. L.-C. Nat. cur. xlvii. pp. 107–140, pl. xi.

Shows that in the genus *Aphis* there are species that leave one food-plant for another, and return afterwards to the original plant. The folio plate illustrates an annual series of the generations of *Aphis padi*, L.

165. *——. Die Entwickelungs- und Lebens-geschichte der Blutlaus, *Schizoneura lanigera*, Hausm., und deren Vertilgung, nebst einem kurzen Anhang, Aehnlichkeiten in der Entwickelungs- und Lebensweise der Blutlaus und der Reblaus betreffend. Cassel: 1885, 58 pp., 1 pl. [*Cf.* Ent. Nachr. xi. p. 206.]

166. Kingsley, J. S. The Standard Natural History. Vol. ii. *Crustacea* and Insects. Boston : 555 pp.

With the exception of the first 130 pp., the whole of this volume is devoted to the Hexapod insects. It contains a vast amount of information.

167. Kirby, W. F. Elementary Text-Book of Entomology. London : 240 pp., 87 pls., containing over 650 figs.

168. Kirsch, T. On the Butterflies of Timor-Laut. P. Z. S. 1885, pp. 275–277, pl. xix.

2 spp. nn. and 1 var. n.

169. Kohl, F. F. Die Gattungen und Arten der Larriden Autorum. [*Hymenoptera.*] Verh. z.-b. Wien, xxxiv. pp. 171-268 & 327–454, pls. viii., ix., xi., & xii.

In this memoir the author tabulates and fully describes all the European genera and species of the family known to him ; in the case of other European species, the original descriptions are reproduced. Of the exotic species only a catalogue is given. The genera *Trypoxylon* and *Nitela* are included in the group, which, however, the author states (p. 175) to be a merely conventional assemblage. 4 new species are described.

170. ——. Die Gattungen der Sphecinen und die palæarktischen *Sphex*-Arten. [*Hymenoptera.*] Term. füzetek, ix. pp. 154–207, pls. vii. & viii.

An elaborate monograph, including 39 species.

171. Konow, F. W. Ueber Blattwespen. [*Hymenoptera.*] Wien. ent. Z. iv. pp. 295–301.

Besides a new genus and some new species, this contains information on *Dineura*, *Selandria excisa*, and *Eriocampa ovata*, and the genus *Kaliosysphingia*.

172. Korschelt, E. Zur Frage nach dem Ursprung der verschiedenen Zellenelemente der Insectenovarien. Zool. Anz. viii. pp. 581–586 & 599–605.

A contribution to the question studied by Will and Wielowiejski (see under). In this memoir Korschelt gives his observations of the ovaries of insects of several orders, made by means of sections ; his conclusions are in some respects at variance with those of both Will and Wielowiejski.

173. Kowalevsky, A. Beiträge zur nachembryonalen Entwicklung der Musciden. [*Diptera.*] *T. c.* pp. 98, 123, & 153.

Pursuing the researches of Weissmann and others on the process of histolysis, he describes the part played by the blood-corpuscles in breaking up the muscles and other tissues and organs. In the second part of the paper he deals with the changes that take place in the three portions of the alimentary canal.

174. Kraatz, G. Ueber die Artrechte der europäischen und die Varietäten der deutschen Maikäfer. [*Melolontha.*] Zweites Stück. Deutsche e. Z. xxix. pp. 49–73.

An extremely discursive paper, giving a large number of varietal names. The species dealt with are *M. vulgaris*, *hippocastani*, *pectoralis*, *papposa*, and *hybrida*.

175. [Kraatz, G.] Ueber die Gattung *Clithria*, Burm. [*Coleoptera.*] *T. c.* pp. 74–77, pl. i.

176. ——. Ueber einige neue *Glycyphana* Arten. [*Coleoptera.*] *T. c.* pp. 76–80.

Three novelties and some varieties described.

177. ——. Die *Cetoniden* der Aru Inseln, nach dem von Herrn C. Ribbe, 1884, gesammelten Materiale. *T. c.* pp. 81–93, pl. i. figs. 4–6.

2 new genera; 13 species altogether are mentioned, described, or discussed, and some important synonymy suggested.

178. ——. Ueber Varietäten von *Sternoplus schaumii*, White. [*Coleoptera.*] *T. c.* p. 94, pl. i. figs. 10–14.

Ten varietal names are mentioned, mostly new.

179. Kriechbaumer, —. Blattwespenstudien. [*Hymenoptera.*] CB. Ver. Regensb. xxxix. pp. 9–20, 135–143, & 145–151.

Chiefly synonymical discussions.

180. Krukenberg, C. F. W. Zur Kenntniss der Serumfarbstoffe. SB. Jen. Ges. 1885, pp. 52–68, pl. i.

The concluding part of this paper relates to insects, chiefly *Saturniidæ*, and some spectra of serum are given on the plate.

181. Lampa, Sven. Förteckning öfver Skandinaviens och Finlands *Macrolepidoptera*. Ent. Tidskr. vi. pp. 1–137.

Complete, with index; for résumé in French, *cf. op. id.* pp. 211–213.

182. Lansberge, J. W. van. Description d'espèces nouvelles de Coléoptères appartenant au Musée civique de Gênes. Ann. Mus. Genov. (2) ii. pp. 375–400.

29 species of Coprophagous *Lamellicornia*, and 1 of *Buprestidæ*.

183. Lansdell, H. Russian Central Asia. Vol. ii. London: 1885.

Pp. 552–615 of this work are devoted to lists of the species of insects known from Russian Central Asia, as follows: *Coleoptera* by Solsky, pp. 552–561; *Mellifera* (Bees) by Moravitz, 438 species, pp. 562–567; *Sphegidæ* by Radoszkovsky, pp. 568–571; *Scoliidæ* by de Saussure, pp. 572–574; *Mutillidæ* by Radoszkovsky, p. 575; *Formicidæ* by Mayr, pp. 566–578; *Chrysidiformes* by Radoszkovsky, pp. 579 & 580; *Lepidoptera* by Erschoff and Alphéraky, pp. 581–608; *Neuroptera* by McLachlan, pp. 609–612; *Orthoptera* by de Saussure, pp. 613–615.

184. Leconte, J. L. Short Studies of North American *Coleoptera* (No. 2). Tr. Am. Ent. Soc. xii. pp. 1–32.

This posthumous memoir consists of brief descriptions of a large number of new species, and revisions of certain difficult genera of *Elateridæ*. It has been prepared for press by Dr. G. H. Horn.

185. Lee, A. Bolles. Les balanciers des Diptères, leurs organes sensifères, et leur histologie. Rec. Z. Suisse, ii. pp. 363–392, pl. xii.

Being not contented with the researches of Hicks, Leydig, Lowne, and Graber, the author undertook the examination of the organs mentioned

by means of sections, and describes the structures as thus observed. [*Cf.* Arch. Sci. Nat. xiii. pp. 1–3.]

186. Lefèvre, E., & Poujade, G. A. Metamorphoses du *Caryoborus nucleorum*, Fab., Coléoptère de la famille des Bruchides. Ann. Soc. Ent. Fr. (6) iv. pp. 243–248, pl. xi.

187. Lemoine, V. Sur le système nerveux du *Phylloxera*. C.R. ci. pp. 961–963.

188. Leng, C. W. Synopses of *Cerambycidæ*. [*Coleoptera.*] Ent. Am. i. pp. 28–35 & 130–136, pls. i.–iii. [Continued from Bull. Brooklyn Soc. vii.]

These synopses are for the use of N. American entomologists; the plates are well worthy of reference.

189. Lewis, G. New Species of *Histeridæ*, with Synonymical Notes. [*Coleoptera.*] Ann. N. H. (5) xv. pp. 456–473, and *op. cit.* xvi. pp. 203–215.

67 new species and several new genera from various localities are described in these two complementary memoirs.

190. ——. On a New Genus of *Histeridæ*. Tr. E. Soc. 1885, pp. 331–335, pl. viii.

The systematic position of this genus (*Niponius*) is considered doubtful, but the neighbourhood of *Tryponæus* is suggested for it. On the plate 4 species and many details of structure are beautifully illustrated.

191. Leuthner, F. A Monograph of the *Odontolabini*, a subdivision of the Coleopterous family *Lucanidæ*. Tr. Z. S. xi. pp. 385–491, pls. lxxxiv.–xcvii.

In this monograph all the known species are described at length, and most of them are figured, several figures being devoted to each species to illustrate the sexes and the various developments of the males; some complex synonymical questions are fully discussed. In addition to the new species, descriptions are given for the first time of both sexes in the case of twelve species where one sex only was previously known.

192. *Lintner, J. A. Second Report on the Injurious and other Insects of the State of New York. Albany: 1885. [*Cf.* Wien. ent. Z. v. p. 204.]

193. Lichtenstein, J. Les Pucérons. Monographie des Aphidiens. Première partie: Genera. Montpellier: 1885, pp. 188, pls. i.–iv.

The headings of the eight chapters contained in this part give an idea of the contents. They are—Bibliographie; liste des espèces d'Aphidiens citées jusqu'à ce jour; classification; flore des Aphidiens; généralités; biologie; classification naturelle; chasse et collection des Aphidiens.

194. Limbeck, R. von Zur Kenntniss des Baues der Insectenmuskeln SB. Ak. Wien, Dritte Abth. pp. 322–349, pl. i.

The insects chiefly used in this histological study were *Oryctes nasicornis* and *Dytiscus marginalis*, but a few others received some

attention. The author finds that considerable differences exist in the minute structure; in *Oryctes nasicornis* the structure comes much nearer to that of the striated muscles of the *Vertebrata* than does that of the *Dytiscus*.

195. Loew, E. Beobachtungen über den Blumenbesuch von Insekten an Freilandplanzen des Botanischen Gartens zu Berlin. JB. kön. bot. Gart. Berl. iii. pp. 68–118 & 253–296. [*Hymenoptera.*]

Contains a large amount of information, arranged entomologically according to the species observed. [*Cf.* also Naturforscher, xviii. p. 263, and Biol. Centralbl. v. pp. 34–36, and a summary in Kosmos, xvi. pp. 311–315.]

196. Löw, F. Bemerkungen über die Fichtengallenläuse. [*Homoptera.*] Verh. z.-b. Wien, xxxiv. pp. 481–488.

Relates to *Chermes abietis*, Linn., and *C. strobilobius*, Kltb., and their distinctive characters.

197. ——. Beiträge zur Naturgeschichte der gallenerzeugenden Cecidomyiden. [*Diptera.*] *Op. cit.* xxxv. pp. 483–510, pl. xvii.

This memoir contains descriptions of new species and observations on others already known. Nearly one-half is occupied by descriptions of, or remarks on, galls whose producers are unknown. Entirely European.

198. Löw, P. Beiträge zur Kenntniss der Cicadinen. Verh. z.-b. Wien, xxxv. pp. 343–358.

New genera and species of these *Homoptera* are described from Austria and neighbouring regions, and some synonymy given.

199. Luciani, L. Sulla vita latente degli ovuli del baco da seta durante l'ibernazione. Ricerche sperimentali. Bull. Ent. Ital. 1885, pp. 71–88.

Results of experiments on the effects of oxygen, hydrogen, carbonic acid, humid atmosphere, and temperature on the vitality of the eggs of the Silkworm moth. The practical results are that the eggs should be kept cold and dry in the hibernation period. At *t. c.* pp. 185–191, are some further notes on the subject, in reply to Prof. L. Luciani.

200. Mabille, P. Diagnoses de Lépidoptères nouveaux. Bull. Soc. Philom. (7) ix. pp. 55–70.

Contains both *Rhopalocera* and *Heterocera*, 48 new species and 2 new genera, chiefly from Patagonia.

201. Macchiati, L. Flora degli Afidi dei dintorni di Cuneo, colla descrizione di alcune specie nuove. Bull. Ent. Ital. pp. 51–70.

The plants are arranged in the alphabetical order of their names, and the Aphides observed on each enumerated.

202. Macleay, W. Revision of the Genus *Lamprima* of Latreille, with descriptions of new species. [*Coleoptera.*] P. Linn. Soc. N. S. W. x. pp. 129–140.

5 new species are described (one being subsequently made a g. n.) in addition to a new *Neolamprima*.

203. MADDOX, R. L. Experiments on Feeding some Insects with the Curved or "Comma" *Bacillus*, and also with another *Bacillus* (*B. subtilis*?). J. R. Micr. Soc. (2) v. pp. 602–607 & 941–952.

These experiments show "that the 'Comma' *Bacillus* from culture can pass in a living state through the digestive tracts of the insects experimented upon, and that under these conditions the insects become possible carriers of contagion, and may infect food by their dejections." The insects used were Bees, Wasps, "Blackbeetles," *Musca vomitoria*, and, more particularly, *Eristalis tenax*.

204. MAINDRON, MAURICE. Sur la vie évolutive de l'*Eumenes petiolatus* var., Fabr. Ann. Soc. Ent. Fr. (6) v. pp. 219–224, pl. iv. [*Hymenoptera.*]

205. MANN, J. Beiträge zur Kenntniss der Microlepidopteren-Fauna der Erzherzogtheimer Oesterreich ob und unter der Enns und Salzburgs. Wien. ent. Z. iv. pp. 5, &c.

Concluded; extending from *Lobesia* to *Alucitina*. Dates and food-plants, as well as localities, are mentioned.

206. MARSEUL, DE. L'Abeille, Journal d'Entomologie, Nos. 289–300.

These parts are devoted nearly entirely to reprints of descriptions of *Necrophaga* and Clavicorns, extending as far as *Colydiidæ*; there is nothing new among them. One sheet contains a continuation of the Catalogue of the *Coleoptera* of the "Ancient" World, completing the *Brachelytra* and commencing the *Necrophaga*.

207. MARSHALL, T. A. Monograph of the British *Braconidæ*. [*Hymenoptera.*] Pt. i. Tr. E. Soc. 1885, pp. 1–280, pls. i.–vi.

The basis of the classification adopted in this work is Förster's system of subfamilies somewhat simplified, the groups of higher value of Wesmael and Haliday being used only for the purpose of catching the eye; these groups are, however, analytically tabulated, as also are those of Förster. The genera and species are described in full, as well as treated analytically in tables, and the synonymy is given; the continental distribution is usually mentioned, in addition to the British localities; many varieties are discriminated, and recorded by numerals, the author having abstained from naming varieties: the species preyed on and the habits are mentioned when known, and the descriptions of genera are supplemented by sagacious remarks. Of the 26 groups of the family, 13 are disposed of in this first instalment: the plates give coloured representations of 40 species. As the work will necessarily be consulted by all students of the family, we shall not detail the synonymy or the points specially alluded to in it.

208. MASKELL, W. M. Further Notes on *Coccidæ* in New Zealand. Tr. N. Z. Inst. xvii. pp. 20–31, pl. vii. [according to number on pl., but viii. on letterpress, the numbering of pls. vii. and viii. in this vol. having been reversed].

Consists of descriptions of new species, with short notes on some previously described, and a brief criticism of a review in Nature, Sept., 1884,

of the author's previous paper on the New Zealand insects of this family. The spreading of *Aspidiotus camelliæ*, *Diaspis boisduvalii* and *sanduli*, and of *Lecanium oleæ* in the colony is recorded.

209. [Maskell, W. M.] Note on an Aphidian Insect infesting Pine Trees, with Observations on the Name "*Chermes*," or *Kermes*. *T. c.* pp. 13–19, pl. xvii.

The insect is causing great injury to imported pines throughout a large part of the colony.

210. Masters, G. Catalogue of the Described *Coleoptera* of Australia. Part 1. *Cicindelidæ* and *Carabidæ*. P. Linn. Soc. N. S. W. x. pp. 295–344.

This is a new edition of the author's previously uncompleted catalogue. It will be found very useful to entomologists, especially if arrangements can be made for giving a complete generic index. 960 species are included in this first part.

211. Mathew, G. F. Life-History of Three Species of Western Pacific *Rhopalocera*. Tr. E. Soc. 1885, pp. 357–367, pl. x. [*Papilio schmeltzi*, *godeffroyi*, and *Xois sesara*.]

212. ——. An Afternoon among the Butterflies of Thursday Island. P. Linn. Soc. N. S. W. x. pp. 257–266.

No less than 48 species were obtained in one afternoon at a not very favourable time of the year.

213. Mayr, Dr. G. Feigeninsecten. [*Hymenoptera*.] Verh. z.-b. Wien, xxxv. pp. 147–250, pls. xi.–xiii.

This paper describes a large number of new species and genera of *Chalcididæ*, chiefly from Brazil, Java, and the island of Socotra. Several pages are devoted to general remarks, and there is an analytical table of the genera the author has investigated. A few previously-known species are redescribed and some synonymy is given.

214. Meyrick, E. Descriptions of Australian *Micro-Lepidoptera*. x. *Œcophoridæ* (continued). P. Linn. Soc. N. S. W. viii. pp. 469–519. xii. *Œcophoridæ* (continued). *Op. cit.* ix. pp. 1045–1082. [For xi. *cf.* Zool. Rec. xxi. *Ins.* p. 244.]

215. ——. On the Classification of the Australian *Pyralidina*. Tr. E. Soc. 1885, pp. 421–456.

This is a continuation of the paper recorded in Zool. Rec. xxi. *Ins.* p. 235. The portion now produced consists of descriptions of genera and species of the *Pterophoridæ*, *Alucitidæ*, *Hydrocampidæ*, and *Oxychirotidæ*, and for the present concludes the series, a paper on the *Pterophoridæ* standing over, however, till next year's vol. of the Society's Transactions.

216. ——. Supplement to a Monograph of the New Zealand *Geometrinæ*. Tr. N. Z. Inst. xvii. pp. 62–68.

This supplement to the monograph published in *op. cit.* xvi. (1883) consists chiefly of specific and generic synonymy, resulting from the author having visited England and studied the types existing in the British Museum, and from his having become acquainted with Lederer's classifi-

cation of the ... group. He now adopts the name *Boarmiadæ* for *Ennomidæ* of his previous paper.

217. [Meyrick, E.] Descriptions of New Zealand *Micro-Lepidoptera*. iv. *Scopariadæ*. *T. c.* pp. 68–120.

This paper includes also all the Australian species of *Scoparia*, *Tetraprosopus*, and *Xeroscopa*. The identifications result from comparisons with the types of Walker, Butler, and Knaggs. The brief introduction consists chiefly of some phylogenetic remarks, and it is also stated that no species of the family is common to Australia and New Zealand. The family is very prominent in the latter country, *Scoparia*, in fact, being the most extensive genus of *Lepidoptera* in its fauna.

218. ——. Descriptions of New Zealand *Micro-Lepidoptera*. vi. *Pyralidina*. *T. c.* pp. 121–140.

This paper deals with *Pyralididæ*, *Pterophoridæ*, and *Hydrocampidæ*. Of each of the first and last families only a single species occurs, and they are probably introductions; but the *Pterophoridæ* comprise 11 species, 9 of which are endemic, and the New Zealand fauna in this family shows little resemblance to the Australian. The families are tabulated, and all the genera, as well as the species, characterized, and the relative numbers of the European and New Zealand species are given in a table. A supplement to the author's previous paper on the *Crambidæ*, *op. cit.* 1882, occupies the concluding ten pages of the present memoir. An abstract of this memoir, with abbreviated diagnoses of the novelties, appeared previously in N. Z. J. Sci. ii. pp. 346–348, but this I have not mentioned in the systematic record.

219. ——. Descriptions of New Zealand *Micro-Lepidoptera*. vii. *Tortricina*. *T. c.* pp. 141–149.

This paper is supplementary to that published by the author, *op. cit.* 1882, and contains 9 additional species. The definitions of the groups *Tortricidæ* and *Grapholithidæ* are re-cast in conformity with the views of Prof. Fernald. The novelties include the Hawaiian *Chiloides straminea*.

220. Millière, P. Acidalie nouvelle, Lépidoptères nouveaux et Chénilles inédites pour la Faune Française. Ann. Soc. Ent. Fr. (6) v. pp. 113–120, pl. ii.

221. *Mingazzini, P. Saggio di un Catalogo dei Coleotteri della Campagna romana. Lo Spallanzani : anno xiv., Roma, 1885. [*Cf.* Bull. Ent. Ital. 1885, p. 358.]

222. Mocsáry, A. Species novæ vel minus cognitæ generis *Pepsis*, Fab. [*Hymenoptera*.] Term. füzetek, ix. pp. 236–271.

About 40 new species, and ten redescriptions.

223. Moleyre, L. Insectes (et Crustacés) comestibles. Bull. Soc. Acclim. (4) ii. pp. 500–523 & 562–576.

A compendium of already known information on this subject.

224. Moore, F. The *Lepidoptera* of Ceylon. London.

Two parts, x. & xi., of this work, viz., pp. 89–304, and pls. clviii.–clxxxi., are recorded in the following pages. The *Heterocera*, from *Ophiusidæ*

to *Pyralidæ*, are included in these parts ; and, in addition to [illegible] insects of this family, we record, a large number of previously described species and genera [illegible] described, and some larvæ that I have not thought it necessary to record in detail ; I have also omitted the synonymy involved by the creation of new genera ; this, indeed, is given only in an incomplete manner in the work itself.

225. Möschler, H. B. Die Nordamerika und Europa gemeinsam angehörenden Lepidopteren. Verh. z.-b. Wien, xxxiv. pp. 273–320.

33 species of *Rhopalocera* and 203 of *Heterocera* are considered to be common to the two regions. The author has apparently given himself much trouble in actually comparing specimens, and many critical remarks on varieties are made. [*Cf.* Smith, *infrà*.]

226. Murdoch, J., & Riley, C. V. Insects. Report of the International Polar Expedition to Point Barrow, Alaska, pp. 133–135.

Unimportant. Riley declined to describe the few probably new but obscure species, chiefly *Diptera*, obtained.

227. Nicéville, L. de. Fourth List of Butterflies taken in Sikkim in Oct., 1884, with Notes on Habits, &c. J. A. S. B. liv. pp. 1–5.

The number of Darjiling species is by this list increased from 284 to 313.

228. ——. List of the Butterflies of Calcutta and its Neighbourhood, with Notes on Habits, Food-plants, &c. *T. c.* pp. 39–54.

Includes 163 species. The notes and statements are rather curt ; 1 new species is described.

229. ——. Descriptions of some New Indian *Rhopalocera*. *T. c.* pp. 117–124, pl. ii.

10 species.

Nitsche, H. [See Judeich & Nitsche.]

230. Olivier, E. Études sur les Lampyrides. [*Coleoptera.* 1. Ann. Soc. Ent. Fr. (6) v. pp. 125–154, pl. iii.

Includes descriptions of new species, critical remarks, synonymy, &c.

231. ——. Catalogue des Lampyrides faisant partie des collections du Musée civique de Gênes. [*Coleoptera.*] Ann. Mus. Genov. (2) ii. pp. 333–374, pl. v.

92 species are enumerated from various countries, and 24 new ones described, in addition to critical notes and various remarks. The plate was delayed in appearance, but is cited in our text.

232. ——. Notes complémentaires à l'essai sur les Lampyrides, pp. 1–4. Published with Marseul's Abeille.

233. Olliff, A. S. A List of the *Cucujidæ* of Australia, with Notes and Descriptions of New Species. [*Coleoptera.*] P. Linn. Soc. N. S. W. x. pp. 203–224.

The list amounts to 46 species, *Tristaria* and *Omma* being rejected as not belonging to the family.

234. Oppenheim, P. Die Ahnen unserer Schmetterlinge in der Secundar und Tertiärperiode. B. E. Z. xxix. pp. 331–349, pls. x.–xii.

An interesting and courageous, though highly speculative paper. The author says that in the Jurassic epoch *Lepidoptera* existed in extraordinary richness of forms, and that the period of separation from the *Neuroptera* is probably to be found as far back as the Carboniferous. He proposes the name Rhipidhorhabdi for certain insect remains which he considers cannot be referred to any of our existing orders, though related to *Lepidoptera*; these are found in the well-known Solenhofen strata of the Jurassic epoch. The remains found in the Tertiary period can be referred, he says, to the Lepidopterous type well-developed. It would be impossible to intercalate these names of remains in the ranks of our existing forms without giving rise to the most serious confusion, and we shall not allude to them in our systematic record. In the case of certain forms, a division of opinion exists as to whether they pertain to *Hemiptera* or *Lepidoptera*. The accompanying plates are photo-lithographs, and of great interest.

235. Ormerod, E. A. Report of Observations of Injurious Insects and Common Farm Pests during the Year 1884, with Methods of Prevention and Remedy. Eighth Report. London: 1885, pp. vii. & 122, woodcuts.

The species specially noticed in this report are mentioned hereafter in their systematic places. The most important observations are those in connection with the Warble-fly, *Œstrus bovis*.

236. Osborn, H. Classification of *Hemiptera*. Ent. Am. i. pp. 21–27.

Consists of some remarks on the extent of the order, and analytical tables of the suborders and families.

237. Osborne, J. A. On the Embryology of *Botys hyalinalis*. [*Lepidoptera*.] Sci. Goss. xxi. pp. 32–36, woodcuts.

238. Pabst, M. Die Gross-Schuppenflügler (*Macro-Lepidoptera*) der Umgegend von Chemnitz und ihre Entwicklungsgeschichte. I. Teil. *Rhopalocera* Tagfalter. *Heterocera*: A. Sphinges; B. Bombyces. Ber. Ges. Chemn. ix. pp. 1–300.

This list contains many observations on times of appearance and other points.

239. Pagenstecher, A. Beiträge zur Lepidopteren-Fauna des Malayischen Archipels. *Heterocera* der Insel Nias (bei Sumatra). JB. nass. Ver. xxxviii. pp. 1–71 & 180, pls. i. & ii.

116 species are enumerated, many being described as new. Bibliography is extensively given, and there are many remarks, also translations of several of Snellen's Dutch descriptions, and a table of geographical distribution. The two plates are coloured and well executed.

240. Pascoe, F. P. List of the *Curculionidæ* of the Malay Archipelago collected by Dr. Odoardo Beccari, L. M. d'Albertis, and others. Ann. Mus. Genov. (2) ii. pp. 201–324, pls. i.–iii.

431 species are enumerated, about one-half being new, in addition to a very large number of new genera.

241. [Pascoe, F. P.] Descriptions of some New Asiatic *Longicornia*. [*Coleoptera*.] Ann. N. H. (5) xv. pp. 49–57.

19 new species of *Lamiidæ* and *Cerambycidæ*, and 3 new genera.

242. Passerini, N. Sulla morte degli insetti per inanizione. Bull. Ent. Ital. 1885, pp. 217–228.

Records of the number of days in which death occurred, and of the loss of weight in the period. The observations relate to 11 species of various orders, but are not sufficiently numerous for inductive purposes. Larvæ of *Cossus* lived 135 days without food.

243. *Peragallo, A. Études sur les Insectes nuisibles à l'Agriculture. II. partie: Le Chêne, la Vigne, l'Oranger, le Citronnier, le Caroubier, le Cerisier, le Figuier, le Châtaigner, le Pommier, le Poirier, &c. Nice: 1885, with coloured plates. [*Cf.* Bull. Ent. Ital. 1885, p. 170.]

244. Perez, T. Imenotteri nuovi o poco conosciuti della Sicilia. Nat. Sicil. iv. pp. 185–189.

A few species, chiefly *Ichneumonidæ*.

245. Péringuey, L. First Contribution to the South-African Coleopterous Fauna. Tr. S. Af. Soc. iii. pp. 74–149, pls. i.–iv.

Consists of descriptions of 100 presumed new species belonging to 48 genera, of many families. Only rarely are comparisons made or allies indicated.

246. Picaglia, L. Pediculini nuovi del Museo di Zoologia ed Anatomia comparata della R. Università di Modena. Atti Soc. Ital. xxviii. pp. 82–90.

7 new species.

247. ——. Pediculini dell' Istituto Anatomo-zoologico della R. Università di Modena. Atti Soc. Mod. Mem. (3) iv. pp. 97–162.

A classified list, with full bibliography, synonymy, and indications of hosts, but without descriptions of novelties. 116 species are included.

248. Planta-Reichenau, A. v. Beiträge zur Kenntniss der biologischen Verhältnisse bei der Honigbiene. JB. Ges. Graub. xxviii. pp. 3–43.

This paper is largely occupied with the chemistry of bee-bread and pollen; pp. 41–43 give a note on the antiseptic value of formic acid in honey.

249. Plateau, F. Recherches expérimentales sur les mouvements respiratoires des Insectes. Mém. Ac. Belg. xlv. No. 8, pp. 1–219, pls. i.–vii.

The author limited his observations to the imago state. His object was to determine, 1, shape during inspiration and expiration; 2, parts of the body participating in the respiratory movements; 3, with certainty the muscles of inspiration and expiration; 4, relation of certain parts of the nervous system to the respiratory movements. The insects used belonged to various orders, and as the account of the

observations extends to 99 chapters, the student must refer to the work itself for further information. The plates are figures made by means of projections on a screen, the variations in shape and the nature of the changes being indicated by means of projecting pieces of paper attached to different parts of the body.

250. [Plateau, F.] Recherches expérimentales sur la vision chez les Insectes. Les Insectes distinguent-ils la forme des objets? Bull. Ac. Belg (3) x. pp. 231–250.

This is a preliminary communication of observations and experiments made to determine this question. The method was the liberation of insects in a darkened room with one or more orifices to admit light. Insects used were two *Diptera*, *Calliphora vomitoria*, *Eristalis tenax*, and two Butterflies, *Vanessa urticæ* and *Pieris napi*.

251. ——. Expériences sur le rôle des palpes chez les Arthropodes maxillés. Première partie: Palpes des insectes broyeurs. Bull. Soc. Zool. x. pp. 67–90.

The observations relate to *Coleoptera*, *Cicindelidæ*, *Carabidæ*, and *Dytiscidæ*, *Staphylinus*, *Geotrupes*, and a few *Orthoptera*. The insects were under observation when intact, and after being deprived partially or completely of their palpi. The following are the conclusions: 1, During mastication the labial and maxillary palpi are inactive; 2, the suppression of the maxillary palpi does not hinder the insects from eating in the normal manner; 3, it is quite the same after suppression of the labial palpi; 4, amputation of the four palpi does not destroy the sense of smell; 5, ablation of the four palpi does not in any way hinder the recognition and prehension of nutriment; 6, in spite of the suppression of the four palpi, the insects eat in a perfectly normal manner.

252. Plötz, Carl. Neue Hesperiden des indischen Archipels und Ost-Africas. [*Lepidoptera.*] B. E. Z. xxix. pp. 225–232.

36 species.

253. Portschinsky, I. Lepidopterorum Rossiæ biologia. 1. *Drepanulidæ*, *Cymatophoridæ*, *Noctuæ* (partim). Hor. Ent. Ross. xix. pp. 50–97, pl. x.

This paper is in Russian, as is also the explanation of the plate, this being devoted chiefly to larvæ. The paper contains apparently observations on mimicry, and a list of *Hymenoptera* parasitic on certain species of *Lepidoptera* (p. 61).

254. ——. Muscarum cadaverinarum stercorariumque biologia comparata. *T. c.* pp. 210–244, woodcuts in text.

Entirely in Russian.

Poujade, G. A. [See Lefèvre.]

255. Poulton, E. B. The Essential Nature of the Colouring of Phytophagous Larvæ (and their Pupæ); with an Account of some Experi-

267. Rees, upon the Relation between the Colour of such Larvæ and that

vomitoria. food-plants. P. R. Soc. xxxviii. pp. 269–315, with a chart

Discusses the fo blood of larvæ and pupæ.

larva, with special retains the results of a large amount of careful

investigation. The observations relate nearly entirely to British species of *Lepidoptera*. The author considers that the colour and texture of the undersides of the food-leaves undoubtedly influence the colour of the larvæ. In the case of *Pygæra bucephalus*, he says that variations in the colour of the derived pigments in the blood occur apparently spontaneously and uselessly.

256. [Poulton, E. B.] Further Notes upon the Markings and Attitudes of Lepidopterous Larvæ, together with a complete account of the life-history of *Sphinx ligustri* and *Selenia illunaria* (larvæ). Tr. E. Soc. 1885, pp. 281–329, pl. vii.

This is complementary to the paper recorded in Zool. Rec. xxi. *Ins.* p. 7. The following headings will give an idea of the nature of the paper: 1, The ontogeny of *Sphinx ligustri*; 2, Further notes on the ontogeny of *Smerinthus ocellatus*; 3, Notes upon the adult larva of *Smerinthus populi*; 4, Notes upon an adult larva of *Smerinthus tiliæ*; 5, Notes upon the adult larva of *Macroglossa stellatarum*; 6, The origin of shagreen dots in *Sphingidæ*; 7, The origin of the oblique and other lines in *Sphingidæ*; 8, The origin of the coloured borders to the oblique and other lines in *Sphingidæ*; 9, Some characters of the horn in the primitive *Sphinx* larva; 10, Instances of the probable passing backwards of characters in the ontogeny; 11, The importance of maintaining the continuity of serial markings; 12, Phytophagic coloration (1, *S. ocellatus*, 2, *S. ligustri*, 3, *S. populi*); 13, The ontogeny of the larva of *Selenia illunaria*; 14, The utilization of the changes in colour before pupation for protective purposes; 15, On a curious habit observed in some larvæ before pupation; 16, An anatomical reason for the special protection of larvæ. The plate represents larvæ and portions of larvæ in various stages and positions.

257. Pryer, H. A Catalogue of the *Lepidoptera* of Japan. Tr. A. S. Japan, xii. pp. 35–103.

This "second part contains the *Ægeridæ*, *Bombycina*, *Noctuites*, and *Geometrina*," and comprises 959 species, a considerable proportion being unnamed. The author believes that "Japan has received her fauna recently from America, Siberia, and Southern Asia."

258. ——. Additions and Corrections to a Catalogue of the *Lepidoptera* of Japan. *Op. cit.* xiii. pp. 22–68.

The *Pyralidina* are given in this part, pp. 48–68, amounting to "nearly 400 species, mostly from Yokohama."

259. Pryer, H. J. S. On Two Remarkable Cases of Mimicry from Elopura. Tr. E. Soc. 1885, pp. 369–374, pl. x. figs. 9–12.

The resemblances are: 1, Between Longicorn Beetle and a Wasp (*Coloborhombus fasciatipennis* and *Mygnimia aviculus*); 2, A diur[illegible] Moth and a Wasp (*Scoliomima insignis* and *Triscolia patricialis*). [illegible]ts

260. Quajat, —. Sugli incrociamenti fra le razze bianche [illegible], with seta. Bull. Ent. Ital. 1885, pp. 229–239. relation of

Effects of crossing races of the Silkworm on the colo[illegible]ements. The with reflections on the time, &c., required to produce account of the

261. Quedenfeldt, G. Verzeichniss der von Herrn Major a D. von Mechow in Angola und am Quango-Strom 1878-81, gesammelten Tenebrioniden und Cisteliden. [*Coleoptera.*] B. E. Z. xxix. pp. 1–38, pl. iii.

68 species, of which a large proportion are new, the latter being described.

262. ——. Copal-Insecten aus Africa. *T. c.* pp. 363–365.

Coleoptera : 1 new genus and 2 species of existing genera.

263. Radoskowski, —. Révision des armures copulatrices des mâles de la famille de Mutillides. [*Hymenoptera.*] Hor. Ent. Ross. xix. pp. 3–47, pls. i.–ix.

The author, who formerly monographed the *Mutillidæ* of the old world, is now of opinion that a knowledge of the sexual armature of the males is indispensable to the correct discrimination of the species, and in this memoir describes and figures the structures in such species as he still possesses. He recommends that they should be made transparent by treatment with caustic potash. He gives a nomenclature of the parts illustrated by woodcuts, pp. 4–6. He adopts Blake's genera *Sphærophthalma* and *Agama*, and adds 3 new ones, besides describing a considerable number of new species.

264. Raffray, A. Note sur la dispersion géographique des Coléoptères en Abyssinie, et descriptions d'espèces nouvelles. Ann. Soc. Ent. Fr. (6) v. pp. 292–304 (pl. vi., not yet published).

The author distinguishes four entomological zones of altitude, corresponding with four very distinct geographical regions, and mentions some of the characteristic forms of each. The zones are :—1, Saharian ; 2, Senegalian ; 3, Ethiopian ; 4, Subalpine—this latter being remarkable for the great affinities its insects present with those of the Alps and Pyrenees ; there being, moreover, a few forms of American affinity.

265. Ragonot, E. L. Revision of the British Species of *Phycitidæ* and *Galleridæ*. [*Lepidoptera.*] Ent. M. M. xxii. pp. 17–32 & 52–58.

The generic nomenclature is also reviewed at length. The chief synonymy mentioned is given hereafter ; but it is very complex, and reference to the original work is recommended.

266. Ratte, F. On the Larvæ and Larva-Cases of some Australian *Aphrophoridæ*. P. Linn. Soc. N. S. W. ix. pp. 1164–1169, pls. lxix. & lxx.

These cases, formed by a Homopterous insect, resemble shells. The name of the species making them is not mentioned, but it is said to be a *Ptyelus*.

267. Rees, J. van. Over de post-embryonale ontwikkeling van *Musca vomitoria*. [*Diptera.*] Maand. Natuurw. xii. pp. 67–77.

Discusses the formation of the thorax of the imago from that of the larva, with special reference to the views of Weissman.

268. Reiber, F. Aperçu des progrès de l'entomologie en Alsace, et notes sur les collectionneurs d'insectes de cette province, suivis d'une notice sur le *Phylloxera* en Alsace-Lorraine. Bull. Soc. Colm. 1883–85, pp. 505–554.

The first of these two memoirs contains much matter of biographical, historical, and general interest.

269. Reitter, E. Die Nitiduliden Japans. [*Coleoptera.*] Wien. ent. Z. iv. pp. 15–18, 39–44, 75–80, 101–104, 141, 142, & 173–176.

This memoir is now completed [*cf.* Zool. Rec. xxi. *Ins.* p. 56] by the publication of full descriptions and a systematic catalogue.

270. ——. Bestimmungs-Tabellen der europäischen Coleopteren. XII. *Necrophaga* (*Platypsyllidæ*, *Leptinidæ*, *Silphidæ*, *Anisotomidæ*, and *Clambidæ*). Verh. Ver. Brünn, xxiii. pp. 1–122. [For some additional notes, *vide* Wien. ent. Z. iv. p. 276.]

A continuation of the series, intended to enable entomologists to determine their European *Coleoptera* by means of analytical tables. In the present table the *Necrophaga* are defined in a short, extremely loose, manner, and the series is then divided into families, which are subdivided. A considerable number of new genera as well as species are proposed, but scarcely any references are given. The most important part of this work is the numerous changes made in the names of genera and larger groups by the application of the method of strict priority, assisted by the idealization that the species placed first in a genus forms its type. Some of the most widely known and ancient of generic names are thus reversed—*e.g.*, *Silpha* and *Necrophorus*—causing the most extreme confusion, as other entomologists firmly refuse to accept the changes and continue to use the names in the old sense. The paper also comprises many changes in classification, some of which, being of a complex character, cannot here be followed; but the nomenclature and classification, so far as they are capable of synonymization, will be given in their place in the systematic portion of our Record. [For review, *vide* Fauvel, Rev. d'Ent. iv. pp. 313–316.]

271. ——. Bemerkungen zu der Arbeit: "die Scydmæniden Nord-ost Afrika's der Sunda inseln und Neu Guinea's," von Dr. L. W. Schaufuss. Deutsche E. Z. xxix. pp. 152–160.

This temperately-written critique must not be neglected by those using the memoir to which it refers.

272. ——. Coleopterologische Ergebnisse einer excursion nach Bosnien in Mai, 1884. *T. c.* pp. 193–216.

Consists of a complete list of the species met with—several hundred—and descriptions of novelties.

273. ——. Beitrag zur Kenntniss der Pselaphiden-Fauna von Valdivia. [*Coleoptera.*] *T. c.* pp. 321–332.

In addition to descriptions of novelties, the author gives tables of the Chilian species of *Aplodea*, *Bryaxis*, and *Sagola*.

274. [Reitter, E.] Abbildungen und Bemerkungen zu wenig gekannten Pselaphiden-Gattungen, mit Beschreibungen neuer Arten. [*Coleoptera.*] *T. c.* pp. 333–339, pls. ii. & iii.

275. Reuter, O. M. Monographia Anthocoridarum orbis terrestris. [*Hemiptera.*] Act. Soc. Fenn. xiv. pp. 555–758.

I have recorded the novelties in genera and species of this memoir; but for the classification reference must be made to the work itself, especially to the Index Systematicus, pp. 749–751.

276. ——. A legujabb felfedezések a rovarok fejlödéstanában. (Les plus recentes découvertes sur l'histoire du développement des Insectes.) Rov. Lapok, ii. pp. 25, 49, 65, & 89.

A summary in French of the contents of this historical paper will be found in Supp. Rov. Lap. ii. pp. iii., &c.

277. ——. Ad cognitionem Lygæidarum palæarcticarum. [*Hemiptera.*] Rev. d'Ent. iv. pp. 199–233.

278. ——. The European Species of the Genus *Clinocoris*, Hahn. [*Hemiptera.*] Ent. M. M. xxii. pp. 37–39, woodcuts; synonymy in note.

279. Rey, C. Descriptions des Coléoptères nouveaux ou peu connus de la tribu des Palpicornes. Ann. Soc. L. Lyon (n.s.) xxxi. pp. 13–32.

About 20 new species, from France and Switzerland, described in anticipation of the next-mentioned work.

280. ——. Histoire naturelle des Coléoptères de France. (Suite.) *T. c.* pp. 213–396.

This is a second edition, very much altered, of Mulsant's *Palpicornes*, issued in 1844. Rey's work contains, however, 160 real or supposed species, though Mulsant's included only 60. *Hydroscapha* is introduced into the family.

281. Riley, C. V. Report of the Entomologist for the year 1884. From the Annual Report of the Department of Agriculture for the year 1884. Washington: 1885, pp. 285–418, pls. i.–x.

The following are the chief heads of subjects:—Cabbage insects, pp. 289–323. General truths in applied entomology; Kerosene emulsions, pp. 323–333. Miscellaneous insects, pp. 334–358. Silk culture, pp. 359–361. Rust of the orange, pp. 361–373. Causes of the destruction of the evergreen and other forest trees in Northern New England and New York, pp. 374–383. Insects affecting the hop and cranberry, pp. 393–398. Various notes, pp. 403–418. Insects about which special information is given will be enumerated in the systematic part of our record, under the abbreviation, Riley, Rep. Ent.

282. ——. Fourth Report of the United States Entomological Commission, being a Revised Edition of Bulletin No. 3, and the Final Report on the Cotton-worm, together with a chapter on the Boll-worm. Pp. xxxvii. & 399, with app. of 147 pp., 2 maps and 64 pls.

This elaborate work deals with two Moths, their ravages, and the means of counteraction; their natural enemies, bibliography, and indeed

almost every aspect of the subject, are fully dealt wi... ...logie en Alsace, et notes suivis, d'une portions of the work will be found under *Lepidoptera* (*Noct...*, *Hymenoptera*, &c.; the economical under that head.

283. [Riley, C. V.] On the Parasites of the Hessian Fly. P. U. S. Nat. Mus. viii. pp. 413–422, pl. xxiii.

Describes and figures 5 minute *Hymenoptera*, 2 of them new.

284. ——. The Periodical *Cicada*; an Account of *Cicada septendecim* and its Tredecim Race, with a Chronology of all Broods known. Bull. Dep. Agric. Ent. No. 8, 1885.

Consists of 46 pp. and some cuts.

285. Ritzema Bos, J. La mouche du Narcisse (*Merodon equestris*, F.) [*Diptera*], ses métamorphoses, ses mœurs, les dégâts causés par ses larves et les moyens proposés pour la détruire. Arch. Mus. Teyl. (2) ii. pp. 45–96, pls. i. & ii.

An exhaustive memoir on this subject.

286. Röber, J. Zur ostindischen Schmetterlings-Fauna. CB. Ent. Ver. (Dresden) 1885, No. 2, pp. 19–23, pl. i.

This is a contribution to the fauna of Kabia, an island east of Celebes.

287. ——. Ein paar neue *Heterocera* von Sud-Celebes. *T. c.* pp. 29–31. [*Cf.* Wien. ent. Z. iv. p. 287.]

288. Röder, V. von. Diptern von der Insel Portorico. S. E. Z. xlvi. pp. 337–349.

Many species are catalogued here, and a few novelties described, and characters, sometimes sexual, of many known species given.

289. Rœlofs, W. Deux espèces de Curculionides trouvées dans les Orchidées de l'Equateur. Ann. Ent. Belg. xxix. pp. 9 & 10.

The species are *Cholus forbesi*, Pasc., and *Sphenophorus morreni*, sp. n.; they were found at London.

290. Rollet, A. Untersuchungen über den Bau der quergestreiften Muskelfasern. I. Theil. Denk. Ak. Wien, xlix. pp. 81–132, 4 pls.

This important histological paper is based on examination of the muscles of about 300 species of *Coleoptera*, whose names are given, p. 89, &c., and a few *Hymenoptera* and *Diptera*, *Periplaneta orientalis*, and a few other *Orthoptera*. The plates give diagrammatic schemes, as well as representations of the minute structure.

291. Romanes, G. J. The Darwinian Theory of Instinct. P. R. Inst. xi. pp. 131–146.

Much of the reasoning and references are entomological.

292. Romanoff, N. M. Mémoires sur les Lépidoptères; rédigés par. Tome II. St. Petersburg: 1885.

The contents of this beautiful volume are—

1. Romanoff, N. M. Les Lépidoptères de la Transcaucasie. 2me partie, pp. 1–118, pls. i.-v. & xiv. [Extends to and includes *Geometræ*.]

274. [Reitter, E.] H. *Lepidoptera* aus dem Achal-Tekke-Gebiete. Zweiter Theil, pp. 119–171, pls. vi.–viii. & xv. [Includes from *Geometridæ* to *Pyralidæ*, the number of species of *Tortricidæ* and *Tineidæ* being comparatively few.]

3. Heylærts, F. J. M. Description d'un genre nouveau et d'une espèce nouvelle appartenant aux *Cossina*, H. S. ; pp. 172–175.

4. ——. Psychides nouvelles ou moins connues de l'Empire Russe ; pp. 176–194, pls. ix. & x.

5. Snellen, P. C. T. Description d'un nouveau genre de Pyralides ; pp. 195–200, pl. xi.

6. Christoph, H. Schmetterlinge aus Nord-Persien ; pp. 201–207, pls. xii. & xiii.

7. Erschoff, N. Verzeichniss von Schmetterlingen aus Central-Sibirien ; pp. 208–211, pl. xvi.

8. Grumm-Grshimaïlo, G. Bericht über meine Reise in das Alai-Gebiet ; pp. 212–247. [Contains notices of *Lepidoptera* observed, and informal descriptions of 5 new Butterflies.]

9. Table of contents, &c. ; pp. 248–262.

The work is reviewed by Speyer at length, S. E. Z. xlvi. pp. 353–369.

293. Rosenstock, R. Notes on Australian *Lepidoptera*, with descriptions of New Species. Ann. N. H. (5) xvi. pp. 377–384, 421, & 443, pl. xi.

The novelties are numerous, especially in *Heterocera*.

294. Roth, H. L. Notes on the Habits of some Australian *Hymenoptera Aculeata*. J. L. S. xviii. pp. 318–328.

These notes are selected by W. F. Kirby from the author's MS., and 1 new species described. The locality of observation was Mackay, Queensland.

295. Sahlberg, J. I. Bidrag till Tschuktschhalföns insektfauna. *Coleoptera* och *Hemiptera* insamlade under Vega-expeditionen vid halföns norra och östra kust, 1878. II. *Coleoptera* och *Hemiptera* insamlade af Vega-expeditionen's medlemmar å Bering's sunds Amerikanska kust. III. *Coleoptera* och *Hemiptera* insamlade af Vega-expeditionen's medlemmar. Veg. Exp. vet. iakt. iv. pp. 1–71 (of a separate copy).

An account of the *Coleoptera* and *Hemiptera* found in the neighbourhood of Behring's Sound, by the 'Vega' Expedition. The *Coleoptera* are not numerous, amounting to about 60 species, but a number of them are new. Of *Hemiptera*, only 6 species were found. Tables of the geographical distribution are given, and the novelties described.

Salvin, O. [See Godman & Salvin.]

296. Sandberg, G. Beobachtungen über Metamorphosen der Arktischen Falter. B. E. Z. xxix. pp. 245–265.

Deals with 23 species of *Rhopalocera* and *Heterocera*.

297. ——. Supplement til sydvarangers Lepidopterfauna. Ent. Tidskr. vi. pp. 187–203.

A résumé, in French, of this contribution to Arctic entomology is given, *t. c.* pp. 221–224.

almost every aspect of the subject, are fully dealt wi... logie en Alsace, et notes ... suivis d'une portions of the work will be found under *Lepidoptera* (... *Hymenoptera*, &c.; the economical under that head.

283. [Riley, C. V.] On the Parasites of the Hessian Fly. P. U. S. Nat. Mus. viii. pp. 413–422, pl. xxiii.

Describes and figures 5 minute *Hymenoptera*, 2 of them new.

284. ——. The Periodical *Cicada*; an Account of *Cicada septendecim* and its Tredecim Race, with a Chronology of all Broods known. Bull. Dep. Agric. Ent. No. 8, 1885.

Consists of 46 pp. and some cuts.

285. Ritzema Bos, J. La mouche du Narcisse (*Merodon equestris*, F.) [*Diptera*], ses métamorphoses, ses mœurs, les dégâts causés par ses larves et les moyens proposés pour la détruire. Arch. Mus. Teyl. (2) ii. pp. 45–96, pls. i. & ii.

An exhaustive memoir on this subject.

286. Röber, J. Zur ostindischen Schmetterlings-Fauna. CB. Ent. Ver. (Dresden) 1885, No. 2, pp. 19–23, pl. i.

This is a contribution to the fauna of Kabia, an island east of Celebes.

287. ——. Ein paar neue *Heterocera* von Sud-Celebes. *T. c.* pp. 29–31. [*Cf.* Wien. ent. Z. iv. p. 287.]

288. Röder, V. von. Diptern von der Insel Portorico. S. E. Z. xlvi. pp. 337–349.

Many species are catalogued here, and a few novelties described, and characters, sometimes sexual, of many known species given.

289. Rœlofs, W. Deux espèces de Curculionides trouvées dans les Orchidées de l'Equateur. Ann. Ent. Belg. xxix. pp. 9 & 10.

The species are *Cholus forbesi*, Pasc., and *Sphenophorus morreni*, sp. n.; they were found at London.

290. Rollet, A. Untersuchungen über den Bau der quergestreiften Muskelfasern. 1. Theil. Denk. Ak. Wien, xlix. pp. 81–132, 4 pls.

This important histological paper is based on examination of the muscles of about 300 species of *Coleoptera*, whose names are given, p. 89, &c., and a few *Hymenoptera* and *Diptera*, *Periplaneta orientalis*, and a few other *Orthoptera*. The plates give diagrammatic schemes, as well as representations of the minute structure.

291. Romanes, G. J. The Darwinian Theory of Instinct. P. R. Inst. xi. pp. 131–146.

Much of the reasoning and references are entomological.

292. Romanoff, N. M. Mémoires sur les Lépidoptères; rédigés par. Tome II. St. Petersburg: 1885.

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A résumé, in French, of this contribution to Arctic entomology is given, *t. c.* pp. 221–224.

298. Saunders, E. Revision of the British Species of *Sphecodes*, Latr. (including 9 additional). [*Hymenoptera.*] Ent. M. M. xxi. pp. 177–180 (conclusion).

299. Schaufuss, L. W. Beitrag zur Fauna der Niederländischen Besitzungen auf den Sunda-Inseln. Hor. Ent. Ross. xix. pp. 183–209.

Exclusively Coleopterous. 100 species are enumerated, and some new ones described in a more or less complete manner. In the middle of the paper there occurs a table of new species of *Toxicum* from different regions, but the characters given are so brief and slight that the species can scarcely be looked on as established.

300. Schenkling, C. Die deutsche Käferwelt. Allgemeine Naturgeschichte der Käfer Deutschlands, sowie ein praktischer Wegweiser die deutschen Käfer leicht und sicher bestimmen zu lernen. Leipzig: xxxviii. & 435 pp., 24 pls.

A popular work, with peculiar coloured plates.

301. Schilde, J. Beiträge und Unterhaltungen zur Schmetterlingskunde (Forsetzung und Schluss). Ent. Nachr. xi. pp. 22–31, 55–62, 97–105, 133–139, 166, & 175.

Deals with many species of *Nymphalidæ* and *Satyridæ*, and contains many important miscellaneous observations, chiefly on variation of species.

302. ——. Immanente Verbindungen beim Entstehen der Anpassungs-Musterung auf Schmetterlingsflügeln. *T. c.* pp. 225–234.

This paper is the result of an examination of the neuration and markings of the under-surface of the wings in *Argynnis* and *Melitæa*, and is unfavourable to a theory of common origin. For instance, he finds that although there is a general resemblance in markings, they occupy a different position on the wings.

303. Schimkewitsch, W. Ueber eine neue Gattung der *Sarcopsyllidæ*-Familie. [*Diptera.*] Zool. Anz. viii. pp. 75–78.

A creature very injurious to herds in Turkestan.

304. Schlechtendal, D. von. Ueber Cecidien. JB. Ver. Zwickau, 1883, pp. 1–18, pl. i.

These notices of galls are classified according to the plants; the greater part relates to *Cecidomyiidæ*. 1 new Cynipid.

305. Schletterer, A. Die Hymenopteren-Gattung *Gasteruption*, Latr. (*Fœnus*, aut.). Verh. z.-b. Wien, xxxv. pp. 267–326, pl. xiv.

A monograph of the genus, containing descriptions and tables by the author of the 35 species known to him, and reproductions of the descriptions of other 44 species unknown to him.

306. Schmid, A. Die Lepidopteren-Fauna der Regensburger Umgegend mit Kelheim und Wörth. 1. *Macro-Lepidoptera.* CB. Ver. Regensb. xxxix. pp. 21, 75, 97, & 151.

Contains many remarks on food-plants, times of appearance, &c.

307. Schmidt, J. Tabellen zur Bestimmung der europäischen Histeriden. [*Coleoptera.*] B. E. Z. xxix. pp. 279–330.

These tables have been carefully prepared with a view of facilitating the determination of the genera and species. They are preceded by two pages giving such an account of the structure and sculpture as is necessary for their comprehension. After the tables a catalogue containing some synonymy is given; this synonymy we have not thought it necessary to detail in our pages, as the paper will be consulted by all interested in this family.

308. Schmidt, O. Metamorphose und Anatomie des männlichen *Aspidiotus nerii*. Arch. f. Nat. li. pp. 169–200, pls. ix. & x.

The first twelve pages and pl. ix. are devoted to the metamorphoses of this *Homopteron*, and the remainder of the memoir deals with various parts of the internal anatomy.

308a. Schmiedeknecht, H. L. O. *Apidæ Europææ* (Die Bienen Europa's) per Genera, Species et Varietates dispositæ, atque descriptæ. Fasc. xi. [vol. ii. pp. 899–976 (33–110), pls. xvi. & xvii.].

Containing continuation of *Osmia*.

309. Schneider, A. Die Entwicklung der Geschlechtsorgane der Insecten. Zool. Beitr. i. pp. 257–300.

This contains information as to the ovaries and testes, and their development, in many species representing most of the orders of Insects. [*Cf.* Ent. Nachr. xi. p. 366.]

310. Schneider, J. S. Mindre entomologiske meddelelser fra det arktiske norge. Ent. Tidskr. vi. pp. 145–159.

A résumé in French of these minor entomological observations (they relate to *Lepidoptera*, *Coleoptera*, and *Hymenoptera*) is given, *t. c.* pp. 215 & 216.

311. Scudder, S. H. Winged Insects from a Palæontological Point of View, or the Geological History of Insects. Mem. Bost. Soc. iii. pp. 353–358.

This paper illustrates the impossibility of classifying together in our present system extinct and living *Insecta*.

312. ——. Systematische Übersicht der fossilen Myriopoden, Arachnoideen, und Insekten: aus Zittel, Handbuch der Palæontologie. I. Abtheilung: Palæozoologie, Bd. ii. Leipzig.

The *Insecta* occupy pp. 747–831, and are illustrated by woodcuts.

313. Sharp, D. On the *Colydiidæ* collected by Mr. G. Lewis in Japan. J. L. S. xix. pp. 58–84, pl. iii.

314. ——. On some *Colydiidæ* obtained by Mr. Lewis in Ceylon. *T. c.* pp. 117–131, pl. vi. [*Coleoptera.*]

Several new genera as well as species are described in this and the preceding memoirs.

——. [See also Blackburn, T., and Godman & Salvin.]

315. Sickmann, F. Die Bewohner der Schwalbennester. JB. Ver. Osnabr. vi. pp. 142–174. [*Col., Lept., Dipt., Hemipt.*]

316. Signoret, V. Liste des Hémiptères recueillis à la Terre de Feu par la Mission de la Romanche. Ann. Soc. Ent. Fr. (6) v. pp. 63–70.

Comprises 5 species, 2 being new.

317. Smith, J. B. An Introduction to a Classification of the North American *Lepidoptera*. Bull. Brooklyn Soc. vii. pp. 141–149.

Gives brief characters of the N. American genera of *Rhopalocera*.

318. ——. An Introduction to Classification of the North American *Lepidoptera*. Ent. Am. i. pp. 81–87.

Continued from Bull. Brooklyn Soc. This portion deals with *Sphingidæ*.

319. ——. Notes on the Systematic Position of some North American *Lepidoptera*. Tr. Am. Ent. Soc. xii. pp. 77–84, pl. iii.

This is not amenable to abstraction. It refers to *Zygænidæ*, *Syntomoidæ*, *Pyromorphidæ*, *Ctenuchidæ*, and *Alypiidæ*. The plate gives details of structure of various parts. [For review, *vide* Möschler, S. E. Z. xlvi. pp. 203–208.]

320. ——. Noctuids Common to Europe and North America. Ent. Am. i. pp. 13–15.

Refers to the species of *Agrotis* mentioned in a paper by Möschler of date 1874. The present memoir contains some remarks on the validity of some species that are still sub judice.

321. ——. Ueber europäische und amerikanische Verwandschafter. S. E. Z. xlvi. pp. 221–224.

Deals with *Lepidoptera*, and is supplementary to Möschler's paper in Verh. z.-b. Wien, 1884, pp. 273–319 [*cf. ante*, No. 225].

322. ——. Species, Varieties, and Races. Canad. Ent. xvii. pp. 3–9.

This is chiefly a protest against the insufficiency of the characters called specific by Lepidopterists.

323. Snellen, P. C. T. *Lepidoptera* van Celebes, verzameld door Mr. M. C. Piepers, met aanteekeningen en beschrijving der nieuwe soorten. Tijdschr. Ent. xxviii. pp. 15–49, pls. ii. & iii.

Chiefly occupied with *Tineina*. It is remarked that 12 *Tortricina* and 11 *Pterophorina* were found. This, being the concluding memoir of the series, has an Appendix of additional observations on Celebes *Lepidoptera* previously recorded by him, and an Index to the whole series.

324. ——. Aanteekeningen over *Ephestia kuhniella*, Zell., en ce verwante soorten, met afbeeldingen door Prof. J. van Leeuwen. [*Lepidoptera.*] *T. c.* pp. 237–251, pl. viii.

The extremely beautiful plate represents the different stages and some structural details.

325. [Snellen, P. C. T.] Die entomologische inhoud van de bijdragen tot de natuurkundige wetenschappen verzameld door H. C. van Hall, &c. *T. c.* pp. 207–212.

A bibliographical paper.

——. [See also Romanoff.]

326. Sorhagen, L. Die Microlepidopteren der Hamburger Torfmoore. Ent. Nachr. xi. pp. 257–264 & 273–285, and Nachtrag, pp. 337–341.

A catalogue of the species of *Pyralidina*, *Tortricina*, *Tincina*, *Pterophorina*, and *Alucitina* of the above locality. There is also added a list of 63 additional species found on other North German moors.

327. ——. Aus meinem entomologischen Tagebuche. B. E. Z. xxix. pp. 81–108.

Deals with *Lepidoptera* of the groups *Pyralidæ*, *Tortricidæ*, *Tineidæ*, and *Pterophoridæ*, and contains many observations on the habits and seasons of the imagines and larvæ, with descriptions of many of the latter.

328. Speyer, A. Lepidopterologische Mittheilungen. S. E. Z. xlvi. pp. 81–96.

Contains notes on distribution and variation of 11 species.

329. Srnka, A. Neue sudamerikanische *Danaidæ* und *Heliconiidæ*. [*Lepidoptera.*] B. E. Z. xxix. pp. 121–130, pl. i.

330. Staudinger, O., & Schatz, E. Exotische Schmetterlinge.

Parts 7–12 of this work have been issued, extending to p. 102, *Nymphalidæ*, and pl. lx., the genus *Mynes*. [For a review, with critical and original observations, *vide* Kheil, M., in Ent. Nachr. xi. pp. 149–157.]

331. Stein, R. v. Tenthredinologische Studien. ix. Die deutschen Arten der Gattung *Allantus*. Ent. Nachr. xi. pp. 113–122.

Synonymical and bibliographical remarks and corrections. The author is desirous of receiving species of *Allantus* from other regions.

332. ——. Ein merkwürdiger Fall von Hyperparasitismus. *T. c.* p. 308.

A Dipteron was reared from pupa of *Lina tremulæ*, a Coleopterous insect; and on the *Macquartia* an Ichneumon, *Mesochorus thoracicus*, was parasitic. [*Cf.* also Mik, *t. c.* p. 343.]

333. Stierlin, —. Bestimmungs-Tabellen europäischer Rüsselkafer. MT. schw. ent. Ges. vii. pp. 99–158.

Carrying the work to the end of the *Brachyderidæ*.

334. Stretch, R. H. Descriptions of New Species of *Heterocera*. Ent. Am. i. pp. 101–107.

These descriptions of *Zygænidæ*, *Lithosiidæ*, and *Arctiidæ* of N. America are published in anticipation of an intended monograph.

335. Swinhoe, C. On *Lepidoptera* collected at Kurrachee. P. Z. S. 1884, pp. 503–529, pls. xlvii. & xlviii.

70 species *Rhopalocera*, 53 of *Heterocera*.

336. [Swinhoe, C.] On the *Lepidoptera* of Bombay and the Deccan. Part I.: *Rhopalocera*. P. Z. S. 1885, pp. 124–148, pl. ix. (164 species.) Part II.: *Heterocera*. Pp. 287–307, pls. xx. & xxi. (142 species.) Part III.: *Heterocera* (continued). Pp. 447–476, pls. xxvii. & xxviii. (214 species.)

337. ——. List of *Lepidoptera* collected in Southern Afghanistan. Tr. E. Soc. 1885, pp. 337–354, pl. ix.

Enumerates 43 species of *Rhopalocera* and 50 of *Heterocera*.

338. Targioni-Tozzetti, —. Note sopra alcune Cocciniglei (*Coccidæ*). Bull. Ent. Ital. 1885, pp. 100–120.

This is chiefly a summary of Commstock's Report to the Commission of Agriculture U. S., 1880, with descriptions, accompanied by woodcuts of a few new forms.

339. Tetens, H. Ueber das Vorkommen mikroskopischer Formenunterschiede der Flügel-schuppen in Correlation mit Farbendifferenzen bei dichromen Lepidopterenarten. B. E. Z. xxix. pp. 161–167, pl. vii.

Relates chiefly to *Gonopteryx rhamni* and *farinosa*, with some minor observations on *Vanessa prorsa* and *levana*.

340. *Thomas, F. Beitrag zur Kentniss alpiner Phytoptocecidien. Wissenschaftliche Beilage zum Programm der Herzogl. Realschule und des Progymnasiums zu Ohrdruf. Gotha: 1885, 18 pp. [*Cf.* Ent. Nachr. xi. p. 366.]

According to this latter, the memoir contains some particulars about Tenthredinous galls on *Salix retusa* and *S. reticulata*, Coleopterous galls on *Hutchinsia alpina*, and Dipterous galls on *Saxifraga aizoides*.

341. Thomson, C. G. Notes hyménoptèrologiques. Première partie: *Cryptidæ*. Ann. Soc. Ent. Fr. (6) v. pp. 17–32.

342. Tornier, G. Zum "Kampf mit der Nahrung." Kosmos, xvi. pp. 130–136.

Deals with the question of mimicry, and is largely entomological. Distinguishes two classes of mimicry:—1. Resemblance between animals; this he considers due to similarity of nutriment. 2. Resemblance to surroundings; due to destruction of the individuals least like their surroundings, *i.e.*, most conspicuous.

343. Trimen, R. Protective Resemblances and Mimicry in Animals. P. S. Af. Soc. iii. pp. lxx.–lxxxii. (President's Address.)

This is chiefly entomological, and contains some observations drawn from the President's experience in S. Africa. [*Cf.* Ent., Feb., 1885; S. E. Z. xlvi. pp. 290–295 & 296–304.]

344. Trois, E. F. Sopra alcuni esperimenti per la conservazione delle larve degl' insetti. Atti Ist. Venet. (6) iii. pp. 189–192.

The writer obtained satisfactory results by the use of a modification of Owen's liquid (noticed in Bull. Ent. Ital. 1885, p. 168).

345. Trybom, F. Insekter och andra lägre djur, funna vid flottadt timmer och bland aff all från sådant. Ent. Tidskr. vi. pp. 161–168.

The observations relate to wood floated down by streams, and are of considerable interest. A résumé in French is given, *t. c.* p. 216.

346. Viallanes, H. Études histologiques et organologiques sur les centres nerveux et les organes des sens des animaux articulés. Troisième memoire : Le ganglion optique de quelques larves de Diptères (*Musca*, *Eristalis*, *Stratiomys*). Ann. Sci. Nat. (6) xix. Art. 4, pp. 1–34, pls. i. & ii.

The two plates are given to the optic ganglion of *Eristalis*. The paper, as may be inferred from the title, is devoted to minute histology, and the author dwells on and elucidates the fact that the visual organs deeply placed in the interior of the larva exist for the future formation of the highly-developed optical apparatus of the perfect insect.

347. ——. Sur la structure interne du ganglion optique de quelques larves de Diptères (*Musca*, *Eristalis*, *Stratiomys*). Bull. Soc. Philom. (7) ix. pp. 75–78.

This is a résumé not amenable to abbreviation.

348. Wailly, A. Educations d'Attaciens sériciġènes faites à Norbiton en 1884. [*Lepidoptera.*] Bull. Soc. Acclim. (4) ii. pp. 410–422.

Gives information as to hybrids in *Platysamia ceanothi* and *P. cecropia* ; and between *Antheræa pernyi* and *A. roylei*.

349. Walker, A. O. Climatic Causes affecting the Distribution of *Lepidoptera* in Great Britain. P. Chest. Soc. N. S. No. 3, pp. 62–68.

350. Walsingham [Lord]. On some Probable Causes of a Tendency to Melanic Variation in *Lepidoptera* of High Latitudes ; being the Annual Address of the President to the Members of the Yorkshire Naturalist's Union, March 3rd, 1885, at Doncaster. Tr. Yorksh. Union, pt. 8, pp. 113–140.

The complex nature of the problem is well illustrated by this memoir. After consideration of the views that have previously been expressed, he suggests the new idea that where the sun's rays are deficient, the darkest-coloured male individuals would, by their superior powers of heat-absorption, become most active, and therefore would most likely pair with the female. The relations to heat were tested by exposing differently-coloured insects on snow during sunshine. [*Cf.* Nature, xxxi. p. 505.]

351. ——. Contributions to the Knowledge of the Genus *Anaphe*, Walk. [*Lepidoptera.*] Tr. L. S. (2) ii. pp. 421–426, pls. xliv. & xlv.

Larvæ, pupæ, perfect insects, and dipterous parasite figured. The insects were reared in the Insectarium of the Zoological Society's Gardens, London.

352. ——. Characters of Two New Genera of *Pterophoridæ*, from Specimens in the British Museum. Ent. M. M. xxi. pp. 175 & 176, woodcuts. [*Lepidoptera* from Ceylon and Australia.]

353. Walter, A. Zur Morphologie der Schmetterlingsflügel. [Deccan. Jen. Ges. 1885, pp. 19–27.

300 species; 700 examples have been examined. Meinert's and Tichomirow's views are partially rejected. In *Macro-Lepidoptera* no mandibles exist; but they are present in *Micropteryx*, which he considers the most primitive of *Lepidoptera*, and are also present in other *Tinecina*. *Acentropus* is, he says, a "typical Lepidopteron, with numerous interesting morphological peculiarities." *Lepidoptera* with short proboscis are discussed, and the author's views as to phylogeny of the orders of *Insecta Sugentia* briefly given. [*Cf.* J. R. Micr. Soc. (2) v. p. 635.]

354. Waterhouse, C. On the Insects (*Coleoptera*) collected on Kilimanjaro by Mr. H. H. Johnston. P. Z. S. 1885, pp. 230–235, pl. xv.

3 species found between 10,000 and 14,000 feet of elevation are noticed; the others, found at a lower elevation, are, to a large extent, the same as those found in S.E. Africa.

355. ——. Aid to the Identification of Insects.

Three parts have been published of this work, comprising pls. cliii.–clxiv., figuring *Lepidoptera*, *Coleoptera*, and *Hymenoptera*.

356. ——. New *Coleoptera* recently added to the British Museum. Ann. N. H. (5) xv. pp. 377–383.

12 new species of various families, and from different localities.

357. Wedde, H. Beiträge zur Kenntniss des Rhynchotenrüssels. Arch. f. Nat. (2) li. pp. 113–143, pls. vi. & vii.

A description of the minute anatomy. The sections represented in the plates are taken from species of several genera.

358. Weise, J. Bestimmungs-Tabellen der europäischen Coleopteren. II. Heft. *Coccinellidæ*. II. Auflage. Mit Berücksichtigung der Arten aus dem nördlichen Asien. Mödling: 1885, 83 pp.

Consists of a series of analytical tables, and is remarkable on account of the enormous number of varieties to which names are given. It would be useless to enumerate these varietal names in our pages. On p. 4, Weise gives a list of the cases in which he thinks it desirable to name varieties.

359. ——. Beschreibung einiger Coccinelliden. [*Coleoptera.*] S. E. Z. xlvi. pp. 227–241.

About 20 new species.

360. ——. Beitrag zur Chrysomeliden- und Coccinelliden-Fauna Portorico's. Arch. f. Nat. (2) li. pp. 144–168, pl. viii.

51 species of the former, and 10 of the latter family are recorded.

361. Weymer, G. Beitrag zur Lepidopteren-Fauna von Nias. S. E. Z. xlvi. pp. 257–283, pls. i. & ii.

26 species are added to Kheil's list of the *Rhopalocera*; and of the *Heterocera* a list of 43 species is given. Besides the descriptions of new species the paper contains many notes of importance on previously-described species, and figures of *Danais*.

373. [Wulp, F. Maï, H. von. Zur Kenntniss der Eibildung bei der Tsetsefliegerwanze. [*Hemiptera.*] Zool. Anz. viii. pp. 369–375.

A preliminary note, published in consequence of Will being engaged in studying the process of egg formation in allied insects. Certain of Will's interpretations of what he observed are discussed, and on p. 375 the author states his own views. [*Cf.* J. R. Micr. Soc. (2) v. p. 798.]

363. Will, F. Das Geschmacksorgan der Insekten. Z. wiss. Zool. xlii. pp. 674–706, pl. xxvii.

The questions discussed are :—1, Have insects a sense of taste? and what influence has it in the struggle for existence? 2, What structure have the peripheral terminations of the organs devoted to it? The opinions and observations of previous writers on the sense of taste in insects are summarized, pp. 674–678. Experiments by the author to prove the existence of the sense are detailed. He considers that in insects the senses are very limited in their bounds, but within these limits are extremely fine—far superior to our own faculties. On p. 680, note, he gives observations made as to the hearing of insects (*Coleoptera*), from which he concludes that they can perceive stridulation at a greater distance than it can be detected by our own ears. His special experiments as to taste are described, p. 682, &c., such as placing sugar in a given spot and afterwards substituting alum. The duration of a particular taste-impression is apparently a long one, p. 684. From these observations he considers it certain that *Hymenoptera* and *Diptera* are endowed with a sense of taste (insects of other orders were not experimented on). He then shows how difficult it is to prove by actual experiment at what spot the sense is located. Search for alteration of colour in the protoplasm under the cup organs under the influence of tasty substances failed, but a result was detected from electricity. He believes, however, that no way exists of ascertaining what are the actual organs of taste other than anatomical and histological examination of each apparatus in connection with a nerve termination. Then follows, p. 686, a discussion on the importance of the sense to the existence; this he considers to be small. The assembling of butterflies in wet places is discussed in note, p. 687. He alludes to the great variety of predilections displayed by different insects as regards sense of taste. Then follow the anatomical and histological investigations; the organs of taste in *Hymenoptera* are treated of; and the terminal neural apparatus at the tip of the ligula and the paraglossæ; the cup like organs at the base of the tongue and on the under-side of the maxillæ are described (and in a note the ravages of *Atta cephalotes* in Brazil are mentioned, this species attacking by preference imported trees, p. 699). He concludes that there can be no doubt that the cup-like organs are portions of an apparatus for a sense of taste, and he also feels convinced that the terminal sensory bristles of the tip of the ligula have a similar function, and that none of the other structures on the trophi or the buccal cavity serve such a purpose. The plate presents numerous figures of the trophi and portions of the trophi, as well as of sections, to show the structures described. He hopes to describe the organs of taste in *Diptera* and *Lepidoptera* shortly.

364. Williston, S. W. On the Classification of [illegible] and the Deccan. *Diptera.* Ent. Am. i. pp. 10–13, 114–116, & 152–155.

Synoptic tables and remarks on several groups.

365. ——. Notes and Descriptions of North American *Xylophagidæ* and *Stratiomyidæ*. [*Diptera.*] Canad. Ent. xvii. pp 121–128.

366. ——. North American *Conopidæ* [*Diptera*]. (Conclusion.) *T. c.* pp. 377–394, pl. xli.

"The present paper completes a monographic review of this small family, with a synopsis of the family, generic and specific characters."

367. ——. Dipterous Larvæ from the Western Alkaline Lakes, and Their Use as Human Food. *T. c.* pp. 87–90.

The larva is presumed to be *Ephydra californica*, Pack. Hundreds of bushels might be obtained, and men and animals fatten on this food.

368. ——. On the North American *Asilidæ*. Tr. Am. Ent. Soc. xii. pp. 53–76.

This is the second paper on this group of N. American *Diptera*, and the species of *Asilus* still remain to be dealt with. The genera are tabulated, and in several genera the species are similarly dealt with, and in addition to the description of novelties many previously described species are redescribed and the synonymy given. Some species from San Domingo are included.

369. Witlaczil, E. Die Anatomie der Psylliden. Z. wiss. Zool. xlii. pp. 569–638, pls. xx.–xxii.

The studies here recorded were undertaken with a view to obtaining evidence as to the phylogeny of the groups of *Homoptera*. The observations are arranged as follows :—i., External structure and segmentation ; ii., Derm, adipose tissue, muscles ; iii., Wax glands and threads ; iv., Tracheal system ; v., Nervous system and sense organs ; vi., Digestive apparatus ; vii., Dorsal vessel ; viii., Pseudovitellus ; ix., Sexual organs (internal and external described at length, and their development) ; x., Affinities of the Phytophthires. Pl. xx. is devoted to external anatomy, pls. xxi. & xxii. to internal.

370. Wood, T. Our Insect Enemies. London : 1885, pp. 220.

A popular work.

371. Wood-Mason, J. Some Account of the "Palan byoo ro," "Teindoung Bo" (*Paraponyx oryzalis*), a Lepidopterous Insect Pest of the Rice Plant in Burmah, which in the Caterpillar Stage Breathes Water by means of Tracheal-gills. Calcutta : 1885, 12 pp., pl.

Described and named from the early stages, the perfect insect being unknown.

372. Wulp, F. M. van der. Eenige uitlandische *Nemocera*. [*Diptera.*] Tijdschr. Ent. xxviii. pp. 79–88, pl. iv.

This consists of amplified descriptions of and notes on species previously characterized by the author in Notes Leyd. Mus. vi. & vii.

373. [Wulp, F. M. van der.] Langwerpige Dexinen-vormen. [*Diptera.*] *T. c.* pp. 189–200, pl. vi.

Describes 4 new genera, and remarks on 3 or 4 known species.

374. ——. Over eenige nitlandischen Ortalinen. [*Diptera.*] *T. c.* pp. 213–233, pl. vii.

Describes a new genus and several new species from different regions, and comments on others.

375. ——. On Exotic *Diptera*. Notes Leyd. Mus. vii. pp. 1–15 & 57–86, pl. v.

Besides descriptions of new species, many notes of known species and synonymies are given ; the most important and original of these are noted in their systematic positions in our pages.

II.—ANATOMY AND PHYSIOLOGY.

1. General and Comparative.

Mojsisovics, Leitfaden bei zoologisch-zootomischen Präparirübungen (2nd ed., Leipzig), devotes pp. 205–211 to *Insecta*, represented by *Melolontha vulgaris*.

Das *Rostrum* in der Ordnung *Coleoptera* ; H. J. Kolbe, B. E. Z. xxix. p. 80. Some theoretical remarks.

Anat. and hist. of *Chironomus prasinus*, Hammond (135).—Anatomy of *Psyllidæ*, Witlaczil (369).—*Antennæ of honeybee*, Briant (46) ; of *ants*, Forel (111).

Head and mouth of Insecta, Barthelemy (18).—Preliminary note on *head* of *larval Musca* (*M. cæsar*), Macloskie, Psyche, iv. p. 218 [*cf.* Brauer (42), p. 301.].—*Mandible* of *Orthoptera*, Chatin (68) ; of *Hymenoptera*, *id.* (70).—Structure of *maxilla* in *Coleoptera*, Burmeister (49) ; in *Hymenoptera*, Chatin (70).—Function of *palpi*, Plateau (251).—*Lepidopterous trophi*, Walter (353).—*Proboscis* of *Rhynchota*, Wedde (357).

The *Dipterous wing*, Adolph (3).—*Coleoptera*, organs of flight and elytra, anatomy and homologies of ; Amans, Ann. Sci. Nat. (6) xix. pp. 146–168, pl. vii.—Structure of the wings of vesicating insects ; Beauregard, J. Soc. Sci. i. 1885, p. 289.—Halteres of *Diptera*, Lee (185).

2. Nervous System, Organs of Sense and Psychology.

Nervous system of *Phylloxera*, Lemoine (187).—Innervation of *proboscis* of *Lepidoptera*, Chatin (69).—*Eye* : Hickson (138), Hyatt (153), Ciaccio (75), Carrière (66).—*Optic ganglion* of *Diptera*, Viallanes (346, 347).—Function of *vision*, Plateau (250).—Sense of *hearing* in *ants* ; Spicer, E. C., P. R. Soc. Queensl. i. pp. 79–81 : an undescribed Queensland ant produces audible sounds ; the sense of hearing in the species is hence inferred.—Sense of *taste*, Will (363).—*Psychology* of *Hymenoptera*, Forel (111).—*Instinct*, Romanes (291).—*Homing faculty* of *Hymenoptera*, &c., discussed

in "Contemporary Review," Nov., 1885, by Lubbock. It is considered that these insects find their way home by means of landmarks; Romanes, Nature, xxxii. p. 630.

3. Muscular System.

Muscular *histology*; Limbeck (194), Rollet (290).

4. Organs and Function of Nutrition.

Dalla Torre proposes to designate by the name of *Heterotrophy* the occurrence of two or more modes of nutrition in one stage of the existence of a species; Zool. Anz. viii. p. 692.—*Gizzard* of beetle (*Curculionidæ*) figured; J. Micr. & Nat. Sci. iv. p. 256, pl. xxi.—Histology of *alimentary canal*, Frenzel (115).

5. Circulation and Respiration.

Circulation in embryo; Ent. M. M. xxii. p. 126.—*Micro-organism* found in the *blood* of *Dytiscus marginalis*; Audollent, Bull. Soc. Ent. Fr. (6) v. p. lxxiv.—Blood serum, Krukenberg (180).—Respiratory movements, Plateau (249).

6. Sexual Organs and Embryology.

Internal sexual organs, development of; Balbiani (14), Schneider (309), Cholodkovsky (*Nematois*) (74).—*Development* of *egg*; Kowalevsky (173), Wielowiejski (362).—*Embryology* of *Botys*, Osborne (237).—*Embryology* of *Bee*, Grassi (129).—Origin of the *endoderm* in *Lepidoptera*; Bruce, A. T., J. Hopk. Univ. Circ. v. No. 43, p. 9, with woodcut.—*Receptaculum seminis* of *Hymenoptera*, Cheshire (72).—Postembryonal development of *Musca*, Rees (267).—Neotenia, Camerano (59).

7. General Biology and Stray Notes.

Biology of *Diptera*, Portschinsky (254); of *Lepidoptera*, *id.* (253); of *Aphis*, Kessler (164).—Development of *Musca vomitoria*, Davison (88).—Hyperparasitism, Stein (332).—Notes on experiments made with the winged form of *Phylloxera vastatrix radicicola*; Morgan, P. E. Soc. 1885, pp. xxvii.-xxxi.: it is concluded that insufficiency of food is probably the chief factor in producing the winged form. Similar observation on *Pemphigus*, Göldi (125).—Conditions affecting *vitality of egg* of Silkworm, Luciani (199).—Conveying *infection*, Maddox (203).—Larvæ of *Diptera* abundant at all depths, and in the most elevated lakes of the Alps, but *Corethra plumicornis* is the only one identified; N. Denk. schw. Ges. xxix. 2 (Essai Plessis-Gouret), p. 51.—*Galls*: Ashmead (6, 7), Bargagli (17), Beyerinck (28), Cameron (63), Gadeau de Kerville (119), Löw (197), Schlechtendal (304), Thomas (340).—*Hibernation* and *gelation*, Hamilton (134).—Hatching *Lepidoptera* by *artificial heat*; Canad. Ent. xvii. p. 76.—*Low temperature* in winter is less injurious to insects than to plants; Fallou, Bull. Soc. Ent. Fr. (6) v. p. lxxiv.—*Cucullia*

scrophulariæ (*Lepidoptera*) four years in pupal condition; P. E. Soc. 1885, p. xxii.—Prolongation of pupal state of *Lycæna iolas* for more than two years; Ent. M. M. xxii. p. 90.—Influence of *magnetism* on insect development; P. E. Soc. 1885, p. xv.—*Crossing races* of silkworm, Quaját (260).—Death from *inanition*, Passerini (242).—Note on the *flight* of *insects*, R. von Lendenfeld, P. Linn. Soc. N.S.W. ix. pp. 986 & 987; pointing out that the form of the wings changes under the influence of insecticides producing tetanus.—Insect *migration*, South, Ent. M. M. xxi. pp. 208–211; Norris, *l. c.* (232); Cockerell, *l. c.*—*Birds* building in *nests of ants* and *hornets*, Nature, xxxi. p. 438.—The destruction of *humble bees*, by *birds* (*Parus*), after feeding on lime flowers; Ent. M. M. xxii. p. 94.—Males of *Noctua* sp. attracted by pupæ near to emergence; Ent. M. M. xxii. p. 112.—*Sexual specialisation*, Cheshire (72), Curley (84).—A weevil (*Eubrychius velatus*) swims freely; P. E. Soc. 1885, p. xxi.—*Ephestia elutella* feeding on red pepper, Ent. M. M. xxii. p. 41.—*Perpendicular clinging*, Dewitz (90), and Arch. mikr. Anat. xxvi. p. 125.—Light of *Luciola*, Emery (97).—Sexual function of tibial spur of *Lepidoptera*; Haase (133).—Fragrant organs in *Lepidoptera*, Dalla Torre (87).—*Silkworm malady*, Ciccone (76, 77).—*Monstrosity* similar in two examples of *Pelophila borealis*, Payk; Ent. M. M. xxii. p. 138.—Specimen of *Rhytirhinus deformis* with a facetted eye on the thorax; Reitter Wien. ent. Z. iv. p. 276.—*Chemical* notes on beebread, honey, &c.; Planta-Reichenau (248).

Mimicry: Brauer (42), Tornier (342), Trimen (343), Pryer (259).

Causation of *melanism*, Walsingham (350).—*Melanism* in *Lepidoptera* of London; Ent. M. M. xxii. p. 137.

Coloration as influenced in *Lepidoptera* by form of scales; Tetens (339).

Phylogeny and Lepidopterous marks; Schilde (302).

Coloration of larvæ, Poulton (255, 256).—*Nature of coloration* in insects, Bergé (26).—Insect coloration generally, Camerano (60).—Similarity of colour, in larva of *Platysamia columbia nokomis*, to its food-plant; P. E. Soc. 1885, p. viii.: the larva described, p. ix.—Remarks on *colour variation* in insects; Hagens, CB. Ver. Rheinl. xxii. pp. 88–91.

Lepidoptera on stone walls and rocks; Ent. M. M. xxii. p. 111.—Larva-cases like shells, Ratte (266).

Palæo-entomology: Brauer (42), Brogniart (46), Goss (128), Hagen (132), Oppenheim (234), Scudder (311, 312).—Insects in *copal*, Quedenfeldt (262).

III.—FAUNISTIC.

The records in this division do not give a complete account of the accretions to, and changes in, each fauna, so that the student who wishes to obtain a complete record as to any special fauna must consult these memoirs, viz.,—2, 4, 12, 17, 20, 21, 23, 24, 25, 29, 30, 31, 32, 33, 38, 40, 41, 44, 45, 48, 52, 53, 61, 71, 73, 80, 81, 93, 95, 96, 109, 113, 114, 116, 119, 120, 127, 131, 139, 143, 144, 157, 158, 162, 163, 164, 175, 176, 178, 179, 182, 186, 189, 191, 193, 195, 196, 197, 200, 204, 206,

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1. Arctic and Antarctic.

Aurivillius (11) (extracted in part, Ent. M. M. xxi. pp. 271 & 272), Murdoch & Riley (226), Sahlberg (295); *Lepidoptera*, Sandberg (296, 297), Schneider (309).

2. Insular (including New Zealand).

Cape de Verde Is., *Lepidoptera*, Meyr., Ent. M. M. xxii. p. 105.—*Hawaiian Coleoptera*, Blackburn & Sharp (34).—*Ellice and Gilbert Is.*, *Lep.*, Butler (54).—*West Pacific*, *Rhopalocera*, Mathew (211).—*Thursday I.*, *id.* (212), and P. Linn. Soc. N. S. W. x. pp. 259-266.—*Claremont I.*, *Lep.*, Mathew, *t. c.* pp. 257 & 258.—*New Zealand*, Colenso (79); *Col.*, Broun (47), and N. Z. J. Sci. ii. p. 381; Sharp, *t. c.* p. 522; *Hym.*, *Bombus*, Ent. M. M. xxi. p. 257; *Lep.*, Meyrick (216–219); *Rhync.*, Maskell, *Coccidæ* (208), *Aphides* (209).—*S. Georgia*, Fairmaire (100), *Col.*

3. Palæarctic Region.

(a.) *Europe and North America (collectively).*

Lepidoptera. Möschler (225), Smith (320, 321).

(b.) *Palæarctic Region and Europe (collectively).*

Coleoptera. Zusätze und Berichtigungen zum Catalogus Coleopterorum Europæ et Caucasi, edit. iii.; Bedel, Wien. ent. Z. iv. pp. 56 & 57; and also many other corrections, Fauvel, Rev. d'Ent. iv. pp. 174–187 & 285–310.—*Necrophaga*, Reitter (270).—*Histeridæ*, Schmidt (307).—*Melolontha*, Kraatz (174).—*Malachiidæ*, Cat. of European, Deutsche e. Z. xxix. pp. 257–263.—*Curculionidæ*, Stierlin (333).—*Coccinellidæ*, Weise (358).

Hymenoptera. *Apidæ*, Schmiedenknecht (308A).—*Larridæ*, Kohl (169).—*Sphegidæ*, *id.* (170).—*Tenthredinidæ*, Konow (171).

Lepidoptera. Kane (160, 161).

Hemiptera. *Lygæidæ*, Reuter (277); *Clinocoris*, *id.* (278).—Rev. d'Ent. iv. pp. 356 & 357.—Species *Capsidarum* regionis palæarcticæ (8 species), Reuter, C.R. ent. Belg. 1885, pp. xlii.–xlviii.

Cicadula and *Thamnotettix*, Rev. d'Ent. iv. pp. 40–110.

(c.) *British Islands.*

Insecta. Report on insects observed in Hertfordshire during the year 1884; F. W. Silvester, Tr. Hertf. Soc. iii. pp. 233–235. Very scanty.

Coleoptera. Synopsis of the British sp. of *Orthoperus*, Matth., Ent. M. M. xxii. pp. 107–110.—Appendix to Des Gozis' Note on *Soronia*, *Aphodius fœtens*, and *Anthicus*, Fowler, *t. c.* pp. 163 & 164.—*Nitidulidæ* (concluded), Fowler, *op. cit.* xxi. pp. 213–219 & 60–67 ; xxii. pp. 33–37 & 69–73.—*Cassida chloris*, *t. c.* p. 13.—*Harpalus litigiosus*, *Rhizotrogus ochraceus*, *Trichius abdominalis*: claims as British discussed ; Ent. M. M. xxi. pp. 220–222 [*cf. t. c.* p. 256].—*Scolytus pruni* and attendants, Dougl., Ent. M. M. xxii. p. 62.—Captures in 1884, Ent. M. M. xxi. p. 211.—*Tachys parvulus* (novelty), Ent. M. M. xxii. p. 43.—Liverpool, Ent. M. M. xxii. p. 62 ; Naturalist, x. p. 45 ; *Clavicornia*, *id.* pp. 237 & 241 ; *Lamellicornia*, *id.* p. 322.—*Luciola italica* at Darlington, Ent. M. M. xxii. p. 138.—Brandon, *t. c.* p. 86.—*Monohammus dentator*, F., at Bath ; P. Bath N. H. v. p. 264.—Near London, Ent. M. M. xxii. p. 115.—Tonbridge, *t. c.* p. 88, P. E. Soc. 1885, p. xix.—Kent, Ent. M. M. xxii. p. 87.—Thanet, *t. c.* pp. 89 & 163.—Isle of Wight, *t. c.* p. 61.—Tenby, *t. c.* p. 139.—Llangollen, Ent. M. M. xxi. p. 277.

Hymenoptera. Note on little-known British *Aculeate Hymenoptera*, Saunders, Ent. M. M. xxi. p. 226 (in connection with *id. op. cit.* xx. p. 270).—*Megalodontes plagiocephalus*, Fab., discussed as British ; Ent. M. M. xxii. pp. 140 & 164.—*Aculeata* of Gloucestershire, Perkins, Ent. M. M. xxii. p. 145.—*Sphecodes* (novelties), Saunders (298).—*Braconidæ*, Marshall (207).—*Tenthredinidæ*, Cameron (62, 64).—Yorkshire, Naturalist, x. p. 115.—Chobham, Ent. M. M. xxii. p. 116.—Scotland, P. N. H. Soc. Glasg. (n. s.) i. pp. v., vii., ix., & xv.—Surrey, *Ichneumonidæ*, P. E. Soc. 1885, p. iii.

Lepidoptera. *Anosia plexippus*, Ent. xviii. pp. 290, 291, & 305.—*Danais archippus* in Dorsetshire, Ent. M. M. xxii. pp. 134 & 161.—*Polyommatus chryseis* var. in Aberdeenshire, P. E. Soc. 1885, p. i.—*Lycæna argiades* (novelty), Cambridge (58).—On the probable extinction of *Lycæna arion* in England, Marsden, Ent. M. M. xxi. pp. 186–189.—*Acherontia atropos* in Ireland, Ent. M. M. xxii. p. 161.—*Sphinx convolvuli*, Ent. M. M. xxii. pp. 111, 134, & 162.—*Deilephila livornica* in Wales, P. E. Soc. 1885, p. xxii.—*Chærocampa celerio* in Staffordshire, Ent. M. M. xxii. p. 99 ; in Essex, *t. c.* p. 135 ; at Brighton, P. E. Soc. 1885, p. xxvi.—*Chærocampa nerii*, Ent. M. M. xxii. p. 89.—*Callimorpha hera*, Ent. xviii. p. 297.—*Cucullia artemisiæ*, Brooks, Ent. xviii. p. 290.—*Hypena obsitalis*, Hübn. (novelty), Cambridge (57).—*Phycitidæ* and *Galleridæ*, Ragonot (265).—*Eudorea phæoleuca* withdrawn, Ent. M. M. xxi. p. 275.—*Scoparia cratægalis*, Ent. M. M. xxi. p. 101 ; was in error for *lineolaris*, *t. c.* p. 236.—*Hyponomeuta* of the apple, Ent. M. M. xxii. p. 100.—*Gelechia tetragonella*, sp. n., Stainton, Ent. M. M. xxii. pp. 99 & 162.—Probable novelties, *Ornix fagivora* and *Nepticula nylandriella* ; Ent. M. M. xxii. p. 64.—New (?) *Nepticula larva*, Ent. M. M. xxii. p. 138.—*Nepticulæ* (of the Mountain Ash), Ent. M. M. xxii. p. 131.—*Nepticula assimilella*, Z. (novelty), Ent. M. M. xxii. p. 113.—*Isle of Purbeck*, Bankes (16).—*West Cornwall*, Rep Penz. 1884–5, p. 89.—*Rochester Macro-Lepidoptera*, Roch. Nat. pp. 113, 153, & 165.—Near *London*, Ent. M. M. xxii. p. 137.—Buxton, "Epping Forest," pp. 100–103.—*St. Albans*, *Trifurcula pallidella* ; Ent. M. M. xxii. p. 65.—List of *Lepidoptera* observed in the

neighbourhood of Hitchin and Knebworth, Herts; [illegible] 319, 324, 327, Hertf. Soc. iii. pp. 261–266 : 419 species, of which 106 are new to the county list.—*Burton-on-Trent*, Ent. xviii. p. 177, &c.—*Yorkshire* (*Heliothis peltigera*), Ent. M. M. xxii. p. 106.—*Butterflies of Lancashire and Cheshire*, Naturalist (2) x. pp. 163, 169, & 206.—*Macro-Lepidoptera* of the Chester district, Walker, P. Chest. Soc. (n.s.) No. 3, pp. 69–85.—Additions to *Lepidoptera of Pembrokeshire*, Ent. M. M. xxi. p. 207.—Translation from S. E. Z. xlv. : The *Lepidoptera* of the Shetland Islands, Scot. Nat. (n.s.) pp. 165–179.—At *Belfast*, Ent. M. M. xxii. pp. 124–126.

Diptera. Leicestershire Syrphidæ, Rep. Leicest. Soc. 1885, p. 128.

Rhynchota. Liburnia guttula and *guttulifera*, characters of; Ent. M. M. xxii. p. 133.—*Hemiptera* at *Chobham*, Ent. M. M. xxi. p. 277.—Note on *Æpophilus bonnairei*, Sign. (at Jersey); C.R. c. pp. 126–128.—Tabulation of *Dicranoneura*, and description of 2 spp. nn. of *Typhlocybidæ*; Edw., Ent. M. M. xxi. p. 228.—*Eriopeltis festucæ* (novelty), Ent. M. M. xxii. p. 141; Ent. xviii. p. 286.—Note on some British *Coccidæ*, Dgl., Ent. M. M. xxii. pp. 157–159.—*Lecanium prunastri* ?, Ent. M. M. xxii. p. 14.

(d.) *North Europe and Siberia.*

Coleoptera. Weitere Beiträge zur Coleopteren-Fauna des Amurgebietes; Heyden, &c., Deutsche e. Z. xxix. pp. 299–308.

Lepidoptera. Scandinavia, Lampa (181).—*Norway*, Förh. Selsk. Chr. 1885, No. 10.

(e.) *Central and Eastern Europe.*

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Carabus. Ergänzende Bemerkungen zu Dr. Gerstäcker's Monographie der chilenischen *Carabus*-Arten; Kr.-Kosch., Deutsche e. Z. xxix. pp. 417–436: some new varieties are described, and 1 new species.

Leptocarabus, subg. n. Type, *C. procerulus*, Chaud.; Géhin, Cat. p. xxiii.

Carabosoma, [illegible] n. For *Calosoma angulatum*, Chev., &c.; *id. t. c.* p. xxxiii.

Aulacoscelus g. n. Type, *C. viridisulcatum*, Chaud.; *id. t. c.* p. xxxiv.

Goniocarabus, n. n. proposed for *Goniognathus*, Kr.; *id. t. c.* p. xvii.

Carabus gauthieri, n. n. for *C. ledereri*, Gauth.; Géhin, Cat. p. 89.

Reitter describes, Wien. ent. Z. iv. pp. 81 & 82, varieties with names of *Procrustes rugosus*, *Carabus calatus*, *montivagus*, *schiedleri*, and *rothi*.

Carabus auronitens: colour variations; Bergé, C.R. ent. Belg. 1885, p. cxxvi. *C. irregularis* var. n., Transylvania; Hopf., Deutsche e. Z. xxix. p. 264. New (named) varieties of *Carabus* (*cf.* Beuthin, Ent. Nachr. xi. p. 219. Variation of *C. rothi*, Dej., discussed; Birthler, Verh. siebenb. Ver. xxxv. pp. 69–76. *C. glabratus* var. n. *extensus*, Orsova; Kr., Deutsche e. Z. xxix. p. 243. *C. glabratus* var. n. *punctato-costatus*, Austria; Haury, Le Nat. vii. p. 31. *C. coelatus*, *dalmatinus*, and *catenatus*: varieties of noticed and described; Haury, Le Nat. vii. pp. 44–46. Varieties of *C. coelatus*, *dalmatinus*, *catenatus*, and *glabratus* discussed at length, and names given to some; Haury, Wien. ent. Z. iv. pp. 109–116. *C. catenulatus* var. n. *trapeti*, Hts. Pyrenees; Bleuse, Le Nat. vii. p. 54. *C. catenulatus* var. n. *solutus*; Oberth., Bull. Soc. Ent. Fr. (6) iv. p. cxlvii. *C. monilis* "var. *trilineata*, nov. var." [*sic*], Switzerland; MT. schw. ent. Ges. vii. p. 199.

Ceroglossus darwinii of Hope is distinct species from *C. darwinii*, Gerst.; Kr., Deutsche e. Z. xxix. p. 17. *C. darwinii*: note on; Kr., Deutsche e. Z. xxix. p. 444.

Coptolabrus jankowskii, Oberth.: description of; Kr., Deutsche e. Z. xxix. p. 309.

Calosoma raffrayi, Fairm. (= *caraboides*, Raff.), described at length and figured; Raff., Ann. Soc. Ent. Fr. (6) v. p. 304, pl. vi. fig. 3.

Callisthenes. Translation from the Russian of the synoptic tables of species in Fedtschenko's Reise in Turkestan, by J. Faust, S. E. Z. xlvi. p. 43 *et seq.*

New species :—

Leistus punctatus, Greece, p. 214, *oberthuri*, Portugal, p. 215, *lenkoranus*, Caucasus, p. 217, *ellipticus*, Smyrna, p. 219, Reitt., Wien. ent. Z. iv.

Nebria viridipennis, p. 353, *planulata*, p. 354, Swanetia, Reitt., Deutsche e. Z. xxix.; *N. retrospinosa*, Caucasus, Heyd., Wien. ent. Z. iv. p. 186; *N. perlonga*, Turkestan, Heyd., Deutsche e. Z. xxix. p. 284; *N. parcula*, Behring Straits, Am. Coast. Sahl., Veg. exp. Vet. iv. p. 47.

Lissopterus hyadesii, sp. n., Fairm., Ann. Soc. Ent. Fr. (6) v. p. 35, Orange Bay.

Procrustes incertus, Asia Minor, Haury, Le Nat. vii. p. 31, and Wien. ent. Z. iv. p. 109.

Carabus porrectangulus, Alp. pont., p. 6, *Pachystus procrustoides*, Diarbekir, p. 7, *berberus*, Constantine, p. 34, *borealis*, Siberia, p. 48, *coriaceus*, Turkestan, p. 52, Géhin, Cat.; *C. semistriatus*, Turkestan, Kr., Deutsche e. Z. xxix. p. 283.

Plectes reitteri, Caucasus, Retowski, Wien. ent. Z. iv. p. 3 (woodcut).

Neoplectes starcki, Caucasus, Heyd, Wien. ent. Z. iv. p. 183 (woodcut).

Ceroglossus similis, Arauco, Kr.-Kosch., Deutsche e. Z. xxix. p. 435.

Calosoma denserugatum, Siberia, p. 58, *granatense*, N. Grenada, *algiricum* (= *sericeum*, Bell.), p. 62, *forreri*, Arizona, *truncatum*, p. 26, *mexicanum*, Mexico, p. 67, Géhin, Cat.; *C. morrisonii*, Co. Horn, Tr. Am. Ent. Soc. xii. p. 128.

Callisthenes persicus, Persia, Géhin, Cat. p. 68.

Cychrides.

Cychrus rickseri, *C.* (*Sphæroderus*) *regularis*, N. America, spp. nn., Lec., Tr. Am. Ent. Soc. xii. p. 2.

Pamborides.

Pamborus opacus, Australia, sp. n., Géhin, Cat. p. 79.

Lacordairia terrena, N. S. Wales, sp. n., Oll., P. Linn. Soc. N. S. W. x. p. 467.

Galeritides.

Galerita decipiens, Arizona, sp. n., Horn, Tr. Am. Ent. Soc. xii. p. 131.

Brachinides.

Brachinus sticticollis, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 225, Madagascar; *B. vittaticollis*, S. Africa, Pering., Tr. S. Af. Soc. iii. p. 75: spp. nn.

Crepidogaster fusco-plagosus, S. Africa, sp. n., *id. t. c.* p. 76.

Lebiides.

Cymindis canigouensis, Fairm.: *C. baudueri*, Perr., and *C. chauloiri*, Fairm., are varieties of this, the latter var. occurs also in Algeria; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 85.

New species:—

Xanthophæa pallida, Australia, Oll., P. Linn. Soc. N. S. W. x. p. 468.

Cymindis obsoleta, Pamir, Jak., Hor. Ent. Ross. xix. p. 288.

Corsyra obsoleta, Turkestan, *id. t. c.* p. 289.

Plagiotelum opalescens, Australia, Oll., P. Linn. Soc. N. S. W. x. p. 469.

Blechrus syriacus, Syria, p. cii., *abeillei*, Hyères, *escorialensis*, Spain, *confusus*, Algeria, p. ciii., Bris., Bull. Soc. Ent. Fr. (6) v.

Lebia punctifera, Arizona, Lec., Tr. Am. Ent. Soc. xii. p. 2; *L. montana*, *lecta*, p. 131, *scapula*, p. 132, *depicta*, *pectita* (= *vittata*, Horn, *nec* Fab.), p. 133, N. America, Horn, Tr. Am. Ent. Soc. xii.

Pericalides.

Miscelus celebensis, p. 184, *javanus* var. *planatus*, p. 183, Celebes, sp. & var. nn., Schauf., Hor. Ent. Ross. xix.

Catascopus chalydicus, N. S. Wales, Oll., P. Linn. Soc. N. S. W. x. p. 470.

Ozænides.

Phyzhytoles parca, Arizona, sp. n., Lec., Tr. Am. Ent. Soc. xii. p. 2.

Masoochara c.

Aleochara salina,

Bosnia, Eppelsh., Deut. Faune gall.-r.. stan, sp. n., Heyd., Deut. ... and also T... e. Z. West Africa, spp. nn., *id. t. c.* p. ... the F.

Graphipterides.

Graphipterus univittatus, S. Africa, sp. n., Pering, Tr. S. Af. Soc. iii. p. 78.

Piezia albosignata, Transvaal, sp. n., *id. t. c.* p. 77, pl. i. fig. 1.

Anthiades.

Polyhirma cinereocincta, *seriefoveata*, *posticalis*, p. vii., *apicata*, p. viii., East Africa, spp. nn., Fairm., C.R. ent. Belg. 1885.

Scaritides.

Crepidopterus raffrayi, Madagascar, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 227.

Dyschirius ornatus, p. 78, *capensis*, p. 79, S. Africa, spp. nn., Pering., Tr. S. Af. Soc. iii.

Panagæides.

Eurysoma angusticollis, Paraguay, p. 329, *fervida*, Argentine Rep., p. 332, spp. nn., Burm., S. E. Z. xlvi.

Brachygnathus burmeisteri, Bahia, sp. n., Sharp, S. E. Z. xlvi. p. 402.

Chlæniides.

Chlænius insperatus, Arizona, Horn, Tr. Am. Ent. Soc. xii. p. 134; *C.* (*Rhizotrachelus*) *giganteus*, Zambesi, p. 79, *immaculatus*, S. Africa, p. 80, Pering., Tr. S. Af. Soc. iii.: spp. nn.

Brachylobus caurinus, California, sp. n., Horn, Tr. Am. Ent. Soc. xii. p. 134.

Cnemacanthides.

Dioctes concinnus, Merv, sp. n., Dohrn, S. E. Z. xlvi. pp. 78 & 256, figured on plate (unnumbered), fig. 6.

Cascellius hyadesii, Orange Bay, sp. n., Fairm., Ann. Soc. Ent. Fr. (6) v. p. 38.

Harpalides.

Harpalus oblitus, Dej. [= *H.* (*Pangus*) *tingitanus*, Fairm.]; Bed., Ann. Soc. Ent. Fr. (6) v. p. 85.

Ophonus puncticollis and *rufibarbis*, characters of; Goz., Rev. d'Ent. iv. p. 115.

Acupalpus longicornis, Sch., and *quarnerensis*, Reitt., differentiated; Reitt., Wien. ent. Z. iv. p. 251.

New species:—

Harpalus foveicollis, France, Dokh., Le Nat. vii. p. 119.

Pangus namaganensis, Turkestan, Heyd., Deutsche e. Z. xxix. p. 285.

Acupalpus longicornis, France, Ab., Rev. d'Ent. iv. p. 153.

Feroniides, or *Pterostichinides.*

Orthomus, Chaud. Notes on synonymy of species of [illegible]*onii*, Co. Kraatz, p. 192, Deutsche e. Z. xxix.

Pœcilus cupreus, L., with four-[illegible] Cat. p. 68. lost); Qued., B. E. Z. p. 180.

New genera and species :—

Lobobrachus, g. n., p. 402, near *Euchroa*, for *L. lacerdæ*, sp. n., p. 403, Bahia ; Sharp, S. E. Z. xlvi.

Crisimus, subg. n. of *Pterostichus*, for *P. placidus*, Rosh. ; Habel., B. E. Z. xxix. p. 143.

Pterostichus (*Platypterus*) *starcki*, Caucasus, Heyd., Wien. ent. Z. iv. p. 187 ; *P.* (*Arachnoidius*) *meisteri*, Bosnia, Reitter, Deutsche e. Z. xxix. p. 196 ; *P. sodalicius*, Turkestan, Heyd., Deutsche e. Z. xxix. p. 286.

Feronia (*Pseudocryobius*) *splendida*, *epipleuralis*, p. 49, *plana*, p. 50, Behring Straits, Am. Coast, Sahl., Veg. exp. Vet. iv. ; *F.* (*Petrophilus*) *tschuctschorum*, p. 12, *F.* (*Pseudocryobius*) *despecta*, p. 14, *excepta*, *sulcipennis*, p. 15, *laviuscula*, p. 16, *thulensis*, p. 18, *nordquisti*, p. 19, *quadrangularis*, p. 20, Tschuktscha Penins., Sahl., Veg. exp. Vet. iv.

Stolonis ulkei, Texas, sp. n., Horn, Tr. Am. Ent. Soc. xii. p. 129, pl. v. fig. 1.

Zabrus obtusangulus, Caucasus, *ærtzeni*, Crete, Reitter, Deutsche e. Z. xxix. p. 356.

Amara elliptica, Amur-land, Heyd., Deutsche e. Z. xxix. p. 305 ; *A.* (*Cyrtonotus*) *augustata*, Behring Straits, Am. Coast, Sahl., Veg. exp. Vet. iv. p. 51.

Anchomenides.

Metromenus fossipennis, fig. 1, *mysticus*, fig. 2, *Colpodiscus lucipetens*, fig. 3, *Blackburnia insignis*, fig. 4, *Cyclothorax multipunctatus*, fig. 5, *scaritoides*, fig. 6, figured ; Tr. R. Dublin Soc. (2) iii. pl. iv.

Bedelinus, g. n., for *Calathus circumseptus*, Germ. ; Ragusa, Nat. Sicil. iv. p. 125.

Platynus (?) *quadrimaculatus*, N. America, sp. n., Horn, Tr. Am. Ent. Soc. xii. p. 130, pl. v. fig. 2.

Pristodactyla præstans, Caucasus, sp. n., Heyd., Wien. ent. Z. iv. p. 189.

Antisphodrus plasoni, p. 357, Rhilo-dagh, *lederi*, p. 358, *suramensis*, p. 360, Caucasus, spp. nn., Reitt., Deutsche e. Z. xxix.

Pogonides.

Omphreus kruperi, S. Greece, sp. n., Reitter, Deutsche e. Z. xxix. p. 357.

Trechides.

[For Italian *Anophthalmus*, *cf.* Gestro (121).]

Anophthalmus doderii, p. 139, pl. iv. fig. 4, *canevæ*, p. 141, fig. 1, *gentillei*, p. 142, fig. 7, *spagnoli*, p. 143, fig. 6, *vaccæ*, p. 532, *apenninus*, p. 533, spp. nn., Caves in Italy, Gest., Ann. Mus. Genov. (2) ii.

Homalodera dorsigera, p. 39, and *suturata*, p. 40, Orange Bay, spp. nn., Fairm., Ann. Soc. Ent. Fr. (6) v.

Trechus hornensis, Orange Bay, *id. t. c.* p. 41 ; *T. grandiceps*, *min-*
Phyg[illegible]-Caucasus, Reitt., Deutsche e. Z. xxix. p. 355 : spp. nn.

Maseochara [illegible]

Aleochara salina,

Bosnia, Eppelsh., Deut Faune gall.-rhen. ii. p. 167, adopts and tabulates West Africa, spp. nn., *id. t. c.* p. [illegible] the French species, viz. :—*Limnæum*,

Notaphus, Plataphus, Campa, Trepanes, Talanes, Synechostictus, Bembidion, Philocthus, Testedium, Princidium, Oeys, Metallina, Laemostenus, Bracteon.

Bembidium femoratum, St., and allies, characters of, tabulated; Goz., Rev. d'Ent. iv. p. 117.

Scotodipnus aubei declared a valid species; Rev. d'Ent. iv. p. 155.

Tachys bistriatus var. *elongatulus* (= *insularis*, Rag.), Reitt., Wien. ent. Z. iv. p. 116. *T. jucundus*, Syria, sp. n., *sexstriatus* var. n. *euphraticus*, Reitt., Deutsche e. Z. xxix. p. 339.

Haliplidæ.

Peltodytes sumatrensis, Sumatra, sp. n., Regt., Notes Leyd. Mus. vii. p. 55.

Dytiscidæ.

Catalogue, *cf.* Branden (41).

Methles (sub *Hydroporus*) *cribratellus*, Fairm., (= *M. punctipennis*, Sharp); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 86.

Dytiscus marginalis, p. 13, *Cybister roeselii*, p. 45, in salt water; Ent. M. M. xxii. Various water-beetles kept in for some weeks, *id.*

Cybister fimbriolatus, Say. Metamorphoses; Dugès, Ann. Ent. Belg. xxix. (2) pp. 26–31. pl. ii. figs. 1–15.

Copelatus mauiensis, Ins. Maui, sp. n., Blkn., Tr. R. Dublin Soc. (2) iii. p. 120.

Hydrophilidæ.

[*Cf.* Rey (279, 280).]

Dugès, E. Métamorphoses du *Tropisternus lateralis*, Fab. Ann. Soc. Belg. xxviii. pp. 7–11, pls. i. & ii.

Kuwert, A. Beiträge zur Kenntniss der Helophoren aus Europa und den angrenzenden Ländern. Wien. ent. Z. iv. pp. 229–232, 261–264, & 309–312.

Discusses numerous species, and gives names to numerous varieties, besides new species. The varietal names are not recorded.

Helophorus pyrenæus, p. 229, Pyrenees, *seidlitzi*, p. 261, Portugal, *reitteri*, Greece, *asturiensis*, Spain, p. 262, *marocanus*, Morocco, p. 263, *linearis*, Dalmatia, p. 309, *corsicanus*, Corsica, *umbilicicollis*, Switzerland, p. 310, spp. nn., Kuwert, Wien. ent. Z. iv.

Brachypalpus, Lap., for part of *Anacæna*; Rey, Ann. Soc. L. Lyon, xxxi. p. 273.

Rey, Ann. Soc. L. Lyon (n.s.) xxxi., describes the following sp[illegible] from France:—*Brachypalpus ambiguus*, p. 13, *Helochares Allum*[illegible] *Laccobius regularis*, p. 14, *Limnobius crinifer*, p. 15, *Brisonii*, Co[illegible] *myrmidon*, *oblongus*, p. 17, *Helophorus arcuatus*, p[illegible] *Hydrochus bicolor*, p. 20, *Octhebius meridionalis*[illegible] *abruptus*, *obscurus*, p. 23, *barnevill*[illegible]

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dis-
iestris,

drœna assimilis, p. 26, *subdeficiens*, p. 27, *subimpressa*, *regularis*, p. 28, *longior*, p. 29, *emarginata*, p. 30, *truncata*, *Cercyon arenarius*, p. 31, *subsulcatus*, p. 32.

Hydrochus impressus, Rey, *t. c.* p. 21, Corsica, sp. n.

Helophorus asperatus, p. 19, *Hydrœna monticola*, p. 30, Switzerland, Rey, *t. c.*, spp. nn.

In a different memoir, *op. cit.*, Rey describes *Hydrophilus angustior*, p. 227, *Paracymus punctillatus*, p. 273, France, spp. nn.

Berosus bonaërensis, p. 219, *patruelis*, p. 220, *festivus*, p. 221, *seriatus*, p. 222, Buenos Aires, spp. nn., Berg., An. Soc. Arg. xix.

Octhebius remotus, Caucasus, *alutaceus*, Lenkoran, p. 361, *narentinus*, Dalmatia, *lenkoranus*, p. 362, *limbicollis*, Lenkoran, *subopacus*, Caucasus, p. 363, *puberulus*, Tiflis, p. 364, spp. nn., Reitt., Deutsche e. Z. xxix.

Hydrœna grandis, Thessaly, sp. n., *id. t. c.* p. 360.

Platypsyllidæ.

Reitter suggests that the European and Canadian *Platypsyllus* may not be the same species; Wien. ent. Z. iv. p. 274.

Staphylinidæ.

Fauvel, A. Les Staphylinides du Manual of the New Zealand *Coleoptera* by Capt. Thomas Broun. Rev. d'Ent. iv. pp. 311–313.

Refers a number of species to their correct genera, and also contains the following synonymy: *Dasynotus*, Broun, is *Calodera*; *Stilicoides* is *Falagria*; *Xantholinus socius*, Fauv. (= *anthracinus*, Broun), *Philonthus nigritulus*, Gr. (= *Staphylinus ovicollis*, Br.), *P. sordidus*, Gr. (= *impressifrons*, Br.), *Oxytelus rugosus*, Gr. (= *Homalium crenulatum*, Br.).

Aleocharides.

Colusa, g. n., p. 288, near *Falagria*, for *C. gracilis*, p. 292, *eximia*, p. 293, *valida*, *exilis*, p. 294, *grandicollis*, p. 295, California, spp. nn.; Casey, Bull. Cal. Ac. Sci. i.

Pontamolota, g. n., p. 296, near *Homalota*, for *Phytosus opacus*, Lec., and *P. californica*, p. 298, *nigriceps*, p. 299, California, spp. nn.; *id. t. c.*

Platyusa, g. n., near *Platonica*, for *P. sonomæ*, sp. n., California; *id. t. c.* p. 305.

Falagria occidua, p. 285, *laticollis*, p. 287, California, spp. nn., *id. t. c.*

Tachyusa experta, p. 300, *linearis*, p. 301, *laticeps*, *faceta*, p. 302, *harfordi*, p. 304, California, spp. nn., *id. t. c.*

Calodera attenuata, California, sp. n., *id. t. c.* p. 306.

Ilyobates californicus, p. 307, *nigrinus*, p. 308, California, spp. nn., *id. t. c.*

Oxypoda insignis, California, sp. n., *id. t. c.* p. 310.

Phytosus bicolor, p. 311, *maritimus*, p. 312, California, spp. nn., *id. t. c.*

Maseochara californica, sp. n., *id. t. c.* p. 309.

Aleochara salina, France, Fauv., Rev. d'Ent. iv. p. 198; *A. reitteri*, Bosnia, Eppelsh., Deutsche e. Z. xxix. p. 197; *A. (Baryodma) picipennis*, West Africa, spp. nn., *id. t. c.* p. 110.

Myrmedonia aculeata, p. 100, *piciceps* p. 102, *koppi*, p. 103, *piliventris*, p. 104, *angusticollis*, p. 105, *costata*, p. 107, *marginata*, p. 108, *alternata*, p. 109, W. Africa, spp. nn., Eppelsh., *t. c.*

Atheta rugipennis, p. 24, *atricornis*, p. 25, *gelida*, p. 26, *Geostiba beringensis*, p. 27, Tschuktscha Penins., spp. nn., Sahl., Veg. exp. Vet. iv.

Bolitochara impacta, sp. n., Oahu, Blkn., Tr. R. Dublin Soc. (2) iii. p. 120 (genus doubtful).

Diestota montana, *incognita*, spp. nn., *id. t. c.* p. 121. *D. rufescens* figured ; *id. t. c.* pl. iv. fig. 7.

Gyrophæna angularis, sp. n., W. Africa, Eppelsh., Deutsche e. Z. xxix. p. 111.

Oligota kauaiensis, p. 122, Kauai, *longipennis*, Oahu, *simulans*, Kauai, p. 123, *variegata*, Oahu, p. 124, Blkn., *prolixa*, Maui, Hawaii, p. 124, spp. nn., Sharp, Tr. R. Dublin Soc. (2) iii. p. 124.

Liophæna flaviceps figured ; *id. t. c.* pl. iv. fig. 10.

Myllæna pacifica, p. 121, Hawaii, *oahuensis*, p. 122, Oahu, spp. nn., Blkn., *t. c.* *M. discedens* figured ; *id. t. c.* pl. iv. fig. 8.

Staphylinides.

Sharp, Biol. Centr. Am. *Col.* i. (2) pp. 393–505, notices the following known species :—*Philonthus flohri*, Sharp, is a var. of *P. furcus*, Nord. ; *P. testaceipennis*, Er., ♂ ; *piceatus*, vars. figured, pl. x. figs. 8–10, *fibularius*, Er., *boucardi*, *apheles*, Solsky, *figulus*, Er. (= *amazonicus*, Sharp), *longicornis*, Steph. (= *famosus*, Solsky), *xanthomelas* (sub *Belonuchus*), Solsky, *xanthopus* (sub *Belonuchus*), Solsky, *tachiniformis*, pl. x. fig. 22, *discretus*, Sharp, fig. 24, *Belonuchus flavipennis*, *formosus*, *erythropterus*, pl. xi. fig. 13, *ephippiatus*, Say, *P. angusticollis*, Er., *cribricollis*, Er., *Sterculia fulgens*, *Homalolinus canaliculatus*, *flavipennis*, Er., *Tesba belti*, pl. xii. fig. 16, *Xantholinus nigriceps*, fig. 20, *Lithocharodes fuscipennis*, pl. xiii. fig. 6 ; *Thyreocephalus* should include *Linidius tenuipes* and *extremus*, Sharp ; *Metoponcus holisoides*, pl. xiii. fig. 11.

Philonthus. Remarks on this genus and *Belonuchus* ; *id. t. c.* pp. 395, 396, 428, & 429.

Note on *Philonthus carbonarius*, Gyll. ; Rey, Rev. d'Ent. iv. pp. 233–235.

Pachycorynus discedens figured ; Tr. R. Dublin Soc. (2) iii. pl. iv. fig. 10.

New genera and species :—

Bryonomus, g. n., for *Cafius canescens*, Mann., and *C. seminitens*, Horn ; Casey, Bull. Cal Ac. Sci. i. p. 313.

Misantlius, Sharp, Biol. Centr. Am. *Col.* i. (2), p. 393, for *M. optatus*, pl. x. fig. 2, *carinulatus*, fig. 3, p. 394, *discedens*, p. 395, Mexico, *torquatus*, p. 394, Guatemala, spp. nn.

Chroaptomus, p. 437, differs from *Philonthus* by the insertion of the antennæ and structure of labrum in the male ; for *P. flagrans*, Er., and *C. regalis*, sp. n., Panama, p. 438, pl. xi. fig. 8 ; Sharp, *t. c.*

Paderomimus, differing from *Philonthus* in structure of pronotum and prosternum ; to include *Philonthus latus*, *lustralis*, Er., *æneiceps*, *cognatus*, *traili*, *capitalis*, *lustrator*, *æneicollis*, *palpalis*, *aberrans*, *conformis*, *propinquus*, *regellus*, *abactus*, and *longipes*, Sharp, as well as the following

spp. nn. : *gentilis*, pl. xi. fig. 17, Mexico, *mandibularis*, p. 439, Guatemala, *chontalensis*, Nicaragua, *salvini*, pl. xi. fig. 18, Panama, p. 440, *capitatus*, Mexico, *hilaris*, fig. 19, p. 441, *nobilis*, Panama, fig. 20, *nigrinus*, Nicaragua, p. 442, *pectoralis*, fig. 16, Guatemala, *punctipennis*, p. 443, *ricinus*, Panama, *simplex*, Guatemala, *mexicanus*, p. 444, *maculipes*, Mexico, *difformiceps*, pl. xi. fig. 23, Guatemala, p. 445, *cephalax*, *nigripennis*, fig. 22, p. 446, *insolitus*, fig. 21, Panama, p. 447, *contractus*, p. 448, Guatemala, Nicaragua, *confertus*, *ornatellus*, p. 449, *basipennis*, Panama, *distans*, Guatemala, *cribratus*, pl. xi. fig. 24 (by error on pl., *P. cribricollis*), p. 450, *perforatus*, *corrosus*, fig. 25, p. 451, Panama ; Sharp, *t. c.*

Linoderus, *id. t. c.* p. 452, for *L. gracilipes*, sp. n., pl. xii. fig. 2, Panama.

Pescolinus, *id. t. c.* p. 453, for *P. palmatus*, sp. n., pl. xii. fig. 3, Panama.

Odontolinus, *id. t. c.* p. 454, for *O. fasciatus*, sp. n., pl. xii. fig. 4, Panama.

Musicoderus, *id. t. c.* p. 455, for *M. cephatoes*, pl. xii. fig. 5, Panama, and *gracilis*, p. 456, Nicaragua, spp. nn.

Pœderallus, *id. t. c.* p. 456, for *P. fragilis*, sp. n., p. 457, pl. xii. fig. 1, Panama.

Plochionocerus, *id. t. c.* p. 471, for *Sterculia formicaria*, Er., *S. funebris*, *fimetaria*, *clavicornis*, *minor*, Sharp, and the following spp. nn.: *brachypterus*, p. 471, pl. xii. fig. 15, Mexico to Panama, *debilis*, p. 472, Guatemala, Sharp, *t. c.*

Homalolinus, for *X. canaliculatus* (pl. xii. fig. 17), *flavipennis*, *divisus*, Er., and the following spp. nn. : *affinis*, Guatemala, *dilutus*, p. 473, *apicalis*, pl. xii. fig. 18, Mexico, *sanguineus*, p. 474, Guatemala, *id.*

Heterolinus, for *X. puncticeps*, Guer., figured, pl. xii. fig. 19, and recorded from Costa Rica, p. 475, Sharp, *t. c.*

Allotrichus, for *A. arenarius*, sp. n., Panama, *id.* p. 486, pl. xii. fig. 24.

Hymeneus, *id. t. c.* p. 487, for *X. impressifrons*, Guer., *X. temporalis* and *pygialis*, Sharp, and the following spp. nn. : *godmani*, Costa Rica, Panama, p. 487, pl. xiii. fig. 1, *splendens*, *cephalotes*, fig. 2, Nicaragua, *divisus*, Panama, p. 488, *amethystinus*, Mexico, *læticulus*, Panama, p. 489.

Somoleptus, *id. t. c.* p. 494, for *Leptacinus clavicornis*, *subtilis*, and ? *debilis*, Er., *nitidus*, Sharp, and the following spp. nn. : *S. æneseens*, pl. xiii. fig. 8, *bicolor*, Guatemala, p. 495, *gracilis*, Mexico, *parvulus*, Guatemala, Panama, *obscurus*, Panama, *obsoletus*, p. 496, *punctulatus*, *sparsus*, *pallipes*, p. 497, *elegans*, *alticola*, Guatemala, *agreeformis*, pl. xiii. fig. 7, Mexico, p. 498, *id. t. c.*

Saurohypnus, *id. t. c.* p. 501, for *S. scutellaris*, sp. n., Mexico, p. 502.

Platyprosopus longicollis, W. Africa, Eppelsh., Deutsche e. Z. xxix. p. 113.

Philonthus (*Rabigus*) *nigriceps*, W. Africa, *id. t. c.* p. 112.

Philonthus crassulus, Sharp, Biol. Centr. Am. *Col.* i. (2) pl. xi. fig. 1, p. 396, *abnormalis*, pl. xi. fig. 2, *palmatus*, pl. x. fig. 4, p. 397, *sallei*, pl. x. fig. 5, p. 398, Mexico, *fissilis*, Guatemala, *griseolus*, p. 399, *alticola*, pl. x. fig. 7, Guatemala, *hogei*, pl. x. fig. 6, p. 400, *iris*, pl. x. fig. 11, p. 401, *carinulatus*, p. 402, Mexico, *guatemalensis*, *accedens*, *cribripennis*, p. 403, Guatemala, *chiriquensis*, Panama, *atriceps*, pl. x. fig. 12, p. 404, Mexico, *melanopus*, Mexico to Panama, *stygialis*, Guatemala, p. 405, *parvimanus*, pl. x. fig. 14, *ochromerus*, fig. 13, Mexico to Panama, *occultus*, Guatemala,

planulatus, p. 407, *mollis*, pl. x. fig. 13, *cavifrons*, p. 408, Panama, *quadraticollis*, pl. x. fig. 16, Mexico to S. America, *latipennis*, fig. 17, p. 409, Mexico, *fulgipennis*, fig. 18, Panama, *seticornis*, Guatemala, *hirtiventris*, Mexico, p. 410, *idoneus*, Guatemala, *rufopygus*, pl. x. fig. 19, p. 411, *rufocaudus*, Panama, *platypterus*, pl. xi. fig. 3, Guatemala, p. 412, *corticalis*, Panama, *godmani*, pl. x. fig. 20, Mexico to Panama, p. 413, *augax*, Mexico, *infimus*, pl xi. fig. 4, Guatemala, Panama, p. 414, *extremus*, *latecinctus*, pl. xi. fig. 5, Guatemala, *lucilius*, Panama, p. 415, *trochanterinus*, pl. xi. fig. 6, p. 417, *zunilensis*, p. 418, Guatemala, *basiventris*, *alternans*, pl. xi. fig. 7, p. 418, *apicicentris*, *oxyporinus*, *colon*, p. 419, *celatus*, p. 420, Mexico, *miscellus*, Guatemala, *oraticeps*, *rusticus*, p. 421, Mexico, *centralis*, Mexico to Panama, *armatipes*, Guatemala, *serpens*, pl. x. fig. 21, Guatemala to Panama, p. 422, *deplanatus*, Guatemala, *macilentus*, Mexico, p. 423, *umbratus*, Mexico to Panama, *prolixicornis*, Guatemala, *solitarius*, Mexico, p. 424, *melancholicus*, Mexico, *rectilaterus*, pl. x. fig. 23, p. 425, *atricolor*, p. 426, Mexico, Guatemala, *optatus*, Mexico, *championi*, pl. x. fig. 25, p. 427, *approximans*, *elegans*, p. 428, Panama.

Belonuchus cognatus, pl. xi. fig. 9, p. 429, Honduras to Panama, *alternatus*, fig. 10, Mexico to Panama, *bidens*, fig. 11, Mexico to Nicaragua, p. 430, *pollens*, p. 431, N. America to Guatemala, *simplex*, Mexico, p. 432, *dejectus*, pl. xi. fig. 12, p. 433, Mexico to Panama, *stenoderus*, Panama, *panamensis*, Guatemala, Panama, p. 434, *docilis*, Guatemala, Panama, *boops*, p. 435, *mimeticus*, pl. xi. fig. 14, *pictipennis*, *similis*, p. 436, Panama, Sharp, *t. c.*

Actobius fortis, Panama, p. 457, *facilis*, Guatemala, *concolor*, Panama, *arduus*, Mexico to Panama, p. 458, *simplex*, Mexico, p. 459, *mixtus*, Mexico, Guatemala, *nitidulus*, pl. xii. fig 6, Guatemala, p. 460, *politus*, Mexico, *delicatulus*, fig. 7, *alternans*, fig. 8, Guatemala, p. 461, *id. t. c.*

Holisus protensus, Guatemala, *confinis*, Panama, p. 462, *solskyi*, Mexico, *prolixus*, pl. xii. fig. 9, p. 463, *atratulus*, *filum*, *rufipes*, Guatemala, *pallens*, Panama, p. 464, *oblitus*, fig. 10, Guatemala, *elatus*, fig. 11, Guatemala, Panama, p. 465, *eleusoides*, Guatemala, p. 466, *id. t. c.*

Diochus inornatus, p. 466, pl. xii. fig. 12, Nicaragua, Panama, *vilis*, Guatemala, p. 467, *id. t. c.*

Agrodes longicornis, p. 467, pl. xii. fig. 13, Nicaragua, *id. t. c.*

Sterculia mandibularis, p. 468, Mexico, Nicaragua, *basalis*, Mexico, *humeralis*, pl. xii. fig. 14, Panama and S. America, *pollens*, Guatemala to Costa Rica, p. 469, *puncticeps*, Costa Rica, *discedens*, Guatemala, p. 470, *id. t. c.*

Xantholinus strigiceps, p. 476, *oculatus*, Nicaragua, *lævipennis*, Mexico, *rudis*, pl. xii. fig. 21, Guatemala, p. 477, *fuliginosus*, *lacertosus*, p. 478, *serpens*, *mexicanus*, Mexico, *brachypterus*, Guatemala, p. 479, *carinatus*, *fumatus*, *resectus*, p. 480, Mexico, *alticola*, Guatemala, *humilis*, pl. xii. fig. 22, Mexico, Guatemala, *discretus*, Guatemala, Panama, p. 481, *championi*, *difficilis*, Guatemala, *laxus*, Guatemala, Panama, p. 482, *vilis*, Mexico, Guatemala, *salvini*, Guatemala, p. 483, *crassiceps*, Mexico, Guatemala, *æneotinctus*, pl. xii. fig. 23, Guatemala, Panama, p. 484, *guatemalensis*, Guatemala, *flagellifer*, *panamensis*, Panama, p. 485, *id. t. c.*

Leptacinus grandiceps, Guatemala, Panama, *oscillans*, Nicaragua, Panama, p. 490, *id. t. c.*

Lithocharodes spinigera, *simillima*, Guatemala, *armata*, Nicaragua, p. 491, *germana*, *fusciventris*, Guatemala, *flohri*, Mexico, p. 492, *gracilis*, Nicaragua, Panama, *sordida*, Panama, *puncticeps*, Mexico, p. 493, *fuscula*, *rufula*, *collaris*, Guatemala, p. 494, *id. t. c.*

Thyreocephalus salvini, pl. xiii. fig. 3, Panama, *subtilis*, Panama, Venezuela, p. 499, *cyanipennis*, Panama, *unicolor*, Mexico, *rufipennis*, pl. xiii. fig. 4, Mexico, Guatemala, p. 500, *puncticeps*, *cribripennis*, Mexico, p. 501, *id. t. c.*

Nudobius celatus, Mexico, Guatemala, p. 502, pl. xii. fig. 25, *id. t. c.*

Metoponcus guatemalensis, Guatemala, *cingulatus*, p. 503, *longiceps*, pl. xiii. fig. 10, Panama, *varians*, fig. 9, Mexico, Guatemala, p. 504, *sinuatus*, Mexico, *minutus*, Panama, p. 507, *id. t. c.*

Othius antarcticus, Orange Bay, Fairm., Ann. Soc. Ent. Fr. (6) v. p. 42.

Pæderides.

[*Cf.* Horn (146) (*Cryptobium*).]

Cryptobium egregium and *fracticorne*. Characters discussed, with woodcuts; Wien. ent. Z. iv. p. 152.

Sharp, Biol. Centr. Am. i. pt. 2, pp. 507–536, notices or figures the following known species of *Pæderides*:—*Cryptobium cephalotes*, *longipenne*, *similipenne*, *assimile*.

Glyptomerus to be treated as sub-g. of *Lathrobium*; Fauv., Rev. d'Ent. iv. p. 28 *et seq.*

Orus. Note on its characters; Casey, Bull. Cal. Ac. Sci. i. p. 315.

Pæderus pelikani. Characters discussed; Wien. ent. Z. iv. p. 153.

New genus and new species:—

Ababactus, near *Cryptobium*, Sharp, Biol. Centr. Am. *Col.* i. (2), p. 533, for *A. depressus*, pl. xiii. fig. 23, *pennatus*, Panama, p. 534, *pallidus*, *gracilis*, fig. 24, Guatemala, *filarius*, Panama, p. 535, *politus*, fig. 25, Guatemala, p. 536, spp. nn., *t. c.*

Cryptobium cribripenne, p. 118, *apicale*, p. 119, *rugiceps*, p. 120, W. Africa, Eppelsh., Deutsche e. Z. xxix.; *C. anceps*, p. 90, *lecontei* (= *carolinum*, Lec., *nec* Er.), p. 94, *vagum*, p. 95, *arizonense*, *vittatum*, p. 96, *ventrale*, p. 97, *properum*, p. 101, *nactum*, p. 102, N. America, Horn, Tr. Am. Ent. Soc. xii.; *C. collare*, Sharp, Biol. Centr. Am. *Col.* i. (2), p. 507, pl. xiii. fig. 12, Mexico to Panama, *umbratum*, p. 508, *salvini*, *grandiceps*, Guatemala, *stipes*, p. 509, *adversum*, p. 510, *speculator*, fig. 13, *palustre*, p. 511, *ferrugineum*, *luridum*, *terminatum*, p. 512, *rubeculum*, Mexico, *æquale*, p. 573, fig. 15, Guatemala, *conforme*, *formosum*, *concolor*, Mexico, p. 514, *mixtum*, fig. 14, Panama, *chontalense*, Nicaragua, p. 515, *coloratum*, Guatemala, *venustum*, *politulum*, p. 516, *complectens*, *stygicum*, Mexico, *tinctipenne*, p. 517, *guatemalense*, *puncticolle*, Guatemala, *modestum*, Panama, p. 518, *jejunum*, *derasum*, Guatemala, p. 519, *crassulum*, Mexico, *certatum*, Nicaragua, p. 520, *flohri*, Mexico, p. 521, *antoniense*, *filarium*, Guatemala,

errans, p. 522, *rugosipenne*, *confine*, *arduum*, p. 523, *tennicorne*, Panama, *ovaticeps*, Guatemala, Panama, p. 524, *celatum*, *subgracile*, p. 525, Guatemala, *apicipenne*, Mexico to Nicaragua, *nasutum*, Nicaragua, fig. 16, *nigriventre*, fig. 21, Mexico and Guatemala, p. 526, *cognatum*, Panama, *perforatum*, Nicaragua to Venezuela, p. 527, *centrale*, fig. 20, Mexico to Nicaragua, p. 528, *affine*, *grandicolle*, Mexico, *brevipenne*, fig. 17, p. 529, *inquisitor*, *monticola*, Guatemala, *mexicanum*, Mexico, p. 530, *lithocharinum*, *ducale*, fig. 18, Panama, p. 531, *grande*, fig. 19, Mexico, *planatum*, Panama, *rostratum*, fig. 22, Guatemala and Panama, p. 532, *aberrans*, p. 533, Guatemala.

Lathrobium guatemalense, Sharp, *t. c.* p. 536 ; *L.* (*Glyptomerus*) *anophthalmum*, Hungary, Fauv., Rev. d'Ent. iv. p. 33; *L. subseriatum*, p. 116, *incertum*, p. 117, W. Africa, Eppelsh., Deutsche e. Z. xxix.

Dolicaon castaneus, p. 114, *limbatus*, p. 115, W. Africa, *id. t. c.*

Scopæus major, p. 125, *fossiceps*, p. 126, *pruinosulus*, p. 127, *tenuis*, p. 128, *latus*, p. 129, W. Africa, *id. t. c.*

Lithocharis peregrina, p. 130, *nitidiventris*, p. 131, W. Africa, *id. t. c.*; *L. incompta*, Hawaii, Sharp, Tr. R. Dublin Soc. (2) iii. p. 124.

Medon simoni, p. 133, *intermixtus*, p. 134, W. Africa, Eppelsh., Deutsche e. Z. xxix.

Stilicus rubellus, W. Africa, *id. t. c.* p. 121.

Sunius bivittatus, p. 122, *simillimus*, p. 123, *longicollis*, *pictus*, p. 124, W. Africa, *id. t. c.*

Pinophilus brachycerus, p. 135, *reticulatus* (Fauv., in lit.), p. 136, *infans*, p. 137, W. Africa, *id. t. c.*

Œdichirus melanurus, W. Africa, *id. t. c.* p. 138.

Stenides.

Notes on *Edaphus*, including *E. nitidus*, Lec. (= *carinatus*, Casey) ; Horn, Bull. Brooklyn Soc. vii. p. 121.

Edaphus africanus, W. Africa, sp. n., Eppelsh., Deutsche e. Z. xxix. p. 139.

Stenus insularis, Hiro Sami, sp. n., Japan, Sahl., Veg. exp. Vet. iv. p. 53.

Oxytelides.

Oxyporus fasciatus, Mels., described as a valid species ; Horn, Tr. Am. Ent. Soc. xii. p. 135. *O. austrinus*, N. America, sp. n., *id. ibid.*

Oncophorus, g. n., near *Acrognathus*, p. 46, for *O. pirazzolii*, sp. n., p. 47, Tunis; Eppelsh., Deutsche e. Z. xxix.

Oxytelus bledioides, Oahu, sp. n., Blkn., Tr. R. Dublin Soc. (2) iii. p. 125.

Bledius gemellus, p. 140, *nitidicollis*, p. 142, *cavus*, p. 143, *fratellus*, p. 144, W. Africa, spp. nn., Eppelsh., Deutsche e. Z. xxix.

Trogophlœus globicollis, p. 145, *koppi*, p. 146, W. Africa, spp. nn., *id. t. c.*

Homaliides.

Amphicroum maculatum, California (= *Stachygraphis maculata*, *op. infrà cit.* x. pl. xi., = *Amphichroum canaliculatum*, Fauv., *nec* Er.), sp. n., Lec., Tr. Am. Ent. Soc. xii. p. 3.

Homalium striatum and *Acidota crenata* in number on walls in a street in Brünn ; Wien. ent. Z. iv. p. 26.

Vellica, g. n., near *Lesteva*, for *V. longipennis*, California, sp. n. ; Casey, Bull. Cal. Ac. Sci. i. p. 321.

Eudectus crassicornis, Louisiana, sp. n., Lec., Tr. Am. Ent. Soc. xii. p. 4.

Homalium algarum, p. 316, *rugipenne*, p. 317, California, spp. nn., Casey, Bull. Cal. Ac. Sci. i.

Phlœopterus longipalpis, California, sp. n., *id. t. c.* p. 318.

Lesteva truncata, California, sp. n., *id. t. c.* p. 322.

Piestides, Protinides, Micropeplides.

Lispinodes (?) *quadratus*, p. 125, *pallescens*, p. 126, spp. nn., Blkn., Tr. R. Dublin Soc. (2) iii. *L. explicandus* figured ; *id. t. c.* pl. iv. fig. 12.

Glyptoma blackburni figured ; *id. t. c.* pl. iv. fig. 11.

Protinus salebrosus, California, sp. n., Casey, Bull. Cal. Ac. Sci. i. p. 323.

Micropeplus caspius, sp. n. (accompanied by tabulation of all the European species), Reitt., Deutsche e. Z. xxix. p. 366.

PSELAPHIDÆ.

Reitter proposes the following substitutions, the originals being preoccupied in other branches of zoology, viz., *Edpercnes* (for *Narcodes*, King), *Ipsimus* (for *Simus*, Raffr.), *Apenicillus* (for *Psilocephalus*, Raffr.), *Imirus* (for *Mirus*, Saulcy) ; Wien. ent. Z. iv. p. 228.

Reitter figures, Deutsche e. Z. xxix., the following *Pselaphidæ* : Pl. ii., *Marellus biscrensis*, fig. 16 ; pl. iii., *Berlara crassipalpis*, fig. 21, *Berdura excisula*, fig. 24, max. palp., *Dicentrius merkli*, fig. 26, max. palp., *Bythinoplectus foveatus*, fig. 28, *Dalmodes rybaxoides*, fig. 29, *Physoplectus armipes*, thorax, fig. 30, *Mirus permirus*, fig. 32, *Namunia myrmecophila*, fig. 33, *Arctophysis gigantea*, fig. 34.

Reitter, *t. c.* pp. 321–332, tabulates the Chilian species of *Aplodea*, *Bryaxis*, and *Sagola*, and on pls. i. & ii. figures *B. puncticeps*, *bifossifrons*, *kindermanni*, and *valdiviensis*.

Reitter suggests that *Tmesiphorus crassicornis* and *princeps*, Shp., belong to the genus *Sintectodes*, and that Sharp's Japanese species of *Raphitreus* are true *Tmesiphori* * ; *t. c.* p. 332.

Bythinus (*Machærites*) *glabratus*, Rye, and *Tychus corsicus* and *T. monilicornis*, Reitter, found in the Island of Ré ; Bonnaire, Bull. Soc. Ent. Fr. (6) v. p. liii.

New species :—

Metopias hirtus, pl. ii. fig. 17, p. 334, *aglenus*, p. 335, Brazil, Reitt., Deutsche e. Z. xxix.

Metopioxys, subg. n. of *Metopias*, with characters of both ; *id. t. c.* p. 334. *M. gladiator*, Brazil, *id. t. c.* p. 335, pl. ii. fig. 18.

Sintectodes diversipalpus, Ceylon, *id. t. c.* p. 333, pl. ii. fig. 20.

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* These suggestions are not justified.—D. S.

Euphalepsus longicornis (no locality, probably Brazil), Reitt., *t. c.* p. 336, pl. ii. fig. 19.

Batrisus (*Syrbatus*) *mirabilis*, Brazil, *id. t. c.* p. 336, pl. iii. fig. 25; *B. ormayi*, Transsylvania, *id. t. c.* p. 367.

Bryaxis approximans, p. 326, pl. ii. fig. 4, *monstrata*, fig. 6, *nasuta* (renamed *anas*, *id.* Wien. ent. Z. iv. p. 317), fig. 7, *longiceps*, fig. 8, p. 327, *validicornis*, fig. 9, *simulans*, figs. 10 & 10*a*, p. 328, *præclara*, fig. 12, *hamidula*, fig. 13, p. 329, *bituberculata*, *tripunctata*, *larvata*, fig. 15, p. 330, Chili, *id. t. c.*

Decarthron verticicornis, Chili, *id. t. c.* p. 323, pl. ii. fig. 3.

Bythinus pauperculus, *islamitus*, *nemilensis*, Bosnia, p. 201, *anguliceps*, Portugal, *sculpticollis*, Genoa, p. 369, *atticus*, Greece, 370, *balkanicus*, Balkans, p. 371, *id. t. c.*

Bythinus (*Macharites*) *argodi*, France, Crois., Rev. d'Ent. iv. p. 173 [*vide* also Fauv., *t. c.* p. 269]; *Macharites halbherri*, Tyrol, Reitt., *t. c.* p. 368.

Tychus creticus, Crete, *id. t. c.* p. 371.

Aplodea adumbrata, p. 322, pl. ii. fig. 1, *spinula*, p. 323, fig. 2, Chili, *id. t. c.*

Intempus punctatissimus, Manilla, *id. t. c.* p. 337, pl. iii. fig. 27.

Adalmus velutinus, New Zealand, *id. t. c.* p. 338, pl. iii. fig. 31.

Sagola elfridæ, *brevipennis*, Chili, *id. t. c.* p. 332.

Pseudoplectus trimiiformis, Chili, *id. t. c* p. 331.

Claviger oertzeni, Crete, *merkli*, Turkey, *emgei*, Eubœa, *id. t. c.* p. 372.

Paussidæ.

Paussus howa, *centurio*, *mucius*, *pipitzi*, and (*Cerapterus*) *molicellus*, Dohrn, figured on pl. unnumbered, figs. 7–11; Dohrn, S. E. Z. xlvi.

Paussus cylindricornis, p. 81, pl. i. fig. 2, *ruszicus*, p. 82, pl. i. fig. 3, *signatipennis*, p. 83, pl. i. fig. 4, *ayresi*, p. 83, pl. i. fig. 5, *novaculatus*, p. 84, pl. i. fig. 6, spp. nn., Pering., Tr. S. Af. Soc. iii.

Scydmænidæ.

Scydmænus angustatus, Luc. (= *S. ditomus*, Reitt.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 86.

Eumicrus punctatus, Casey, differentiated from *Cholerus zimmermanni*; Bull. Cal. Ac. Sci. i. p. 333.

New species :—

Scydmænus deformatus, California, Horn, Tr. Am. Ent. Soc. xii. p. 138, pl. v. fig. 11; *S. ovalipennis*, Fontainebleau, Bonnaire, Bull. Soc. Ent. Fr. (6) v. p. liv.; *S. princeps*, *galerus*, New Zealand, Broun, N. Z. J. Sci. ii. p. 384.

Phanganophana oreas, *lanosa*, *augustata*, New Zealand, *id. t. c.*

Neuraphes korbi, Portugal, p. 373, *tripunctatus*, Caucasus, p. 374, Reitt., Deutsche e. Z. xxix.

Stenichnus euryponensis, Eubœa, *id. t. c.* p. 374.

Cephennium puncticolle, Eubœa, *id. t. c.* p. 373.

Chevrolatia bonnairei, Algeria, Qued., Ent. Nachr. xi. p. 148; figured, B. E. Z. xxix. pp. 168–172, pl. v. figs. 1 & 2, described at length, and its distinctions from *C. insignis* discussed.

Silphidæ.

[*Cf.* Reitter (270).]

The family consists of the subfams. *Cholevini*, *Eucinetini*, and *Silphini*, the second of these being transferred here from the *Dascillidæ*, in conformity with the views of C. G. Thomson; Reitt., Verh. Ver. Brünn, xxiii. pp. 3–5.

Cybocephalini considered a subgroup of *Clambidæ*; *id. t. c.* p. 120.

Peltis, Geoff. (= *Phosphuga*, auct.), Reitt., *t. c.* p. 75; *Parasilpha*, Reitt., p. 76 (= *Silpha*, Fab. & auct.); *Dendroxena*, Motsch., p. 81 (= *Xylodrepa*, Th.); *Blitophaga*, Reitt., p. 82 (= *Oiceoptoma*, auct., *nec* Leach); *Pseudopelta*, Voet. (= *Thanatophilus*, auct.), p. 83; *Asbolus*, Voet. (= *Necrodes*, Wilk., auct.), p. 85; *Silpha*, L. (= *Necrophorus*, Fab., auct.), p. 85: Reitt., *t. c.*

Ptomaphagus, auct. The use of this name, and of *Catops*, mutually reversed by Reitter, *t. c.* pp. 49 & 62.

Liodes and *Anistoma*, Er. & auct. The use of these two names reversed; *id. t. c.* pp. 96 & 108.

Colon subcurvipes, n. n. for *C. curvipes*, Reitt., *nec* Mäk.; *id.* Wien. ent. Z. iv. p. 276.

Scotocryptus described at length, and *S. obscurus*, sp. n., Bahia; Sharp, C.R. ent. Belg. 1885, pp. xxi. & xxii. Note on the characters and position of the genus; Horn, Ent. Am. i. p. 51. *S. parasitus*, Brazil, sp. n., Reitt., Verh. Ver. Brünn, xxiii. p. 92.

Lyrosoma distinct from *Pteroloma*, redescribed; Sahl., Veg. exp. Vet. iv. p. 66.

The truffle beetle, *Anistoma cinnamomea*, and larva, figured and noticed; Gard. Chron. (2) xxiii. p. 248.

Silpha opaca. Ravages on beet; Orm., Rep. viii. p. 59.

New genera and species:—

Trocharanis, for *Ant. mestrei*, Ab.; Reitt., Verh. Ver. Brünn, xxiii. pp. 9 & 12.

Fericeus, for *Drim. kraatzi*, Friv.; *id. t. c.* pp. 10 & 13.

Hexaurus, for *Phol. merkli*, Friv.; *id. t. c.* pp. 11 & 15.

Apropeus, for *Phol. leptoderus*, Friv.; *id. t. c.* pp. 10 & 13.

Spelæodromus, *id. t. c.* pp. 10 & 13, for *S. pluto*, sp. n., Croatia; *id. t. c.* p. 13.

Perrinia, *id. t. c.* pp. 11 & 16, for *Adelops kiesenwetteri*, Dieck.

Dissochætus, *id. t. c.* p. 39, near *Sciodrepa*, for *D. murrayi*, *hetschkoi*, p. 39, *glabricollis*, p. 40, Brazil; *id. t. c.*

Anemadus, *id. t. c.* pp. 38 & 58, to include *Catops strigosus* and others, and *Catopomorphus incisipennis*, Sauley, *A. arcadius*, Greece, Asia Minor, *pulchellus*, Sicily, p. 59, *maritimus*, Nice, *pellitus*, Corfu, spp. nn.; *id. t. c.*

Ablattaria, *id. t. c.* p. 75, for *Silpha lævigata* and *arenaria*.

Aclypea, pp. 71 & 81, for *Silpha undata*, Müll., which (= *S. reticulata*, Fab., & auct.); Reitt., *t. c.* *A. cicatricosa*, sp. n., Persia, *id. t. c.* p. 82.

Ipelates, *id. t. c.* pp. 89 & 90, for *Hadrambe latissimus*, Reitt.

Cyrtoplastus, *id. t. c.* pp. 108 & 110, for *Agathidium seriatopunctatum*, Bris., and *A. punctatoseriatum* Reitt.

Pseudocolenis, for *P. hilleri*, sp. n., Japan; *id. t. c.* p. 92.

Echinocoleus, near *Choleva*, for *E. setiger*, sp. n., Arizona; Horn, Tr. Am. Ent. Soc. xii. p. 136.

Trocharanis xambeui, France, Argod. Bull. Soc. Ent. Fr. (6) v. p. cxliii.

Oriotus micklitzi, Reitt., Verh. Ver. Brünn, xxiii. p. 14, Carniola.

Aphaobius heydeni, *id. t. c.* p. 17, Carniola.

Bathyscia subrotundata, p. 19, Carniola, *turcica*, Turkey, *bosnica*, Bosnia, p. 20, *majori*, p. 24, Sardinia, *frondicola*, Genoa, *pumilio*, N. Italy, p. 25, *fugitiva*, p. 35, Catalonia, *id. t. c.*; *B. delicata*, Italy, Reitt., Deutsche e. Z. xxix. p. 375; *B. bosnica*, Bosnia, *id. t. c.* p. 202.

Ptomaphagus hybridus, Erzeroum, *grusinus*, Caucasus, p. 52, *speluncarum*, p. 53, Sardinia, *subfasciatus*, p. 55, Bône, *substriatus*, p. 56, Finland, *dichrous*, p. 57, Caucasus, Reitt., Verh. Ver. Brünn, xxiii.; *P. fissus*, *ulkei*, N. America, Horn, Tr. Am. Ent. Soc. xii. p. 137.

Choleva hirtula, p. 41, Lebanon, *pilifera*, p. 42, Lenkoran, *libanotica*, Lebanon, *emgei*, Athens, p. 43, Reitt., Verh. Ver. Brünn, xxiii.; *C. islamita*, Bosnia, *id.* Deutsche e. Z. xxix. p. 202; *C. alsiosa*, Alaska, Horn, Tr. Am. Ent. Soc. xii. p. 136.

Nargus cribellarius, p. 44, Caucasus, *rotundangula*, Morocco, *lenkorana*, Lenkoran, p. 45, *nikitana*, Montenegro, *armeniaca*, Elizabethpol, p. 46, *islamita*, Bosnia, p. 47, Reitt., Verh. Ver. Brünn, xxiii.

Catops tarbensis, p. 62, Tarbes, *clavalis*, p. 63, Sardinia, *id. t. c.*

Colon longitarse, Morocco, *troglocerum*, Algeciras, p. 65, *curvipes*, Italy, p. 66, *id. t. c.*; *C. perrini*, Spain, *id.* Deutsche e. Z. xxix. p. 375.

Silpha (*Necrophorus*, auct.) *funeror*, p. 87, *antennata*, p. 88, Caucasus, *id.* Verh. Ver. Brünn, xxiii.

Necrophorus distinctus, Celebes, Grouvelle, Notes Leyd. Mus. vii. p. 263.

Silpha cæruleoviridans, Zambesi, Dohrn, S. E. Z. xlvi. p. 138.

Hydnobius puncticollis, Caucasus, *demarchii*, Sicily, Reitt, Verh. Ver. Brünn, xxiii. p. 94; *H. arizonensis*, Horn, Tr. Am. Ent. Soc. xii. p. 138.

Anisotoma abbreviata, Behring Straits, Asiatic Coast, Sahl., Veg. exp. Vet. iv. p. 65.

Liodes (= *Anisotoma*, auct.) *rectangula*, Caucasus, *nitida*, Carpathians, p. 97, *pilifera*, p. 98, Lenkoran, *subglobosa*, p. 100, Germany, *gallica*, p. 101, France, *calcarifera*, p. 104, Caucasus, spp. nn., Reitt. *t. c.*; *L. subtilis*, Turkestan, *id.* Deutsche e. Z. xxix. p. 286.

Cyrtusa subferruginea, sp. n., France, Italy, *id.* Verh. Ver. Brünn, xxiii. p. 107.

Agathidium caucasicum, p. 111, Caucasus, *bohemicum*, Bohemia, *opuntiæ*, Greece, *banaticum*, Resicza, p. 113, *aglyptoides*, Croatia, *tenuicorne*, Caucasus, p. 114, *nasicorne*, Lenkoran, *bescidicum*, Caucasus, p. 115, *rotundulum*, Europe, *hellenicum*, Greece, p. 116, spp. nn., *id. t. c.*

Loricaster viertli, Hungary, *caspicus*, Lenkoran, *atomus*, Syria, p. 119, *pumilus*, Europe, p. 120, spp. nn., *id. t. c.*

Cybocephalus viridiæneus, p. 120, Europe, *smaragdifrons*, Constantine, *hispanicus*, Spain, p. 121, spp. nn., *id. t. c.*

Eucinetus hopffgarteni, p. 71, Austria, *id. t. c.*

TRICHOPTERYGIDÆ.

Characters of *Ptilium fungicola*, *Trichopteryx fungians*, and *T. longipennis*, Casey, given to show their validity; Casey, Bull. Cal. Ac. Sci. i. p. 327.

Actidium robustulum, p. 324, *granulosum*, p. 325, *attenuatum*, p. 326, California, spp. nn., *id. t. c.*

Astatopteryx hunjarica, Hungary, sp. n., Reitt., Deutsche e. Z. xxix. p. 376.

SCAPHIDIIDÆ.

Scaphisoma dilutum, sp. n., Caucasus, Reitt, Wien. ent. Z. iv. p. 83.

HISTERIDÆ.

[*Cf.* Lewis (189, 190), Schmidt (307).]

Hister decollatus and *glabratus*, Roth, *regularis*, Lec., *præcox*, *pusio*, Er., *Platysoma dufali*, Mars., *Dendrophilus sulcatus*, Motsch., *Dendrodipnis grandis*, Reitt., *Dendrophilus finitimus*, Walk. (it is a *Carcinops*), *Saprinus rubripes* and *æqualis*, Walk., *Styphrus*, Motsch., and *Xenonychus* and *Teretriosoma*, are noticed by Lewis, Ann. N. H. (5) xv. pp. 456–473, who also gives the following synonymy:—*Liodema 4-dentatum*, F. (= *Hololepta flagellata*, Kirb.), Kirby's locality being no doubt erroneous; *Platysoma restoratum*, Walk. (= *quinquestriatum*, Motsch., = *dohrnii*, Mars.); *P. desinens* Walk. (= *ceylonicum*, Motsch., = *motschulskyi*, Mars.); *Hister cinnamomeus*, White, is a *Platysoma*; *Hister scævola*, Er. (= *mundissimus*, Walk.); *H. cælestis*, Mars. (= *femoralis*, Motsch.); *Teretrius pulex*, Fairm. (= *brunneus*, Lew.). And in *op. cit.* xvi. pp. 203–215, the same author comments on the peculiarities of the ectoderm in *Onthophilus*, and specially notices *Hololepta complanata*, Palis., *Platysoma cinnamomeum*, White (descriptions of these two are reproduced); *Pachycærus raffrayi*; *Hister calidus*, Er. (? the same as *H. striolatus*, Mars.), *H. limbatus*, Truqui; *Tribalus minimus*, Rossi; and corrects error in Zool. Rec. xx., by which *Crypturus argiolus*, Rossi, is placed under *Histeridæ*. *Saprinus bicolor*, Fab. (= *lautus*, Woll., *nec* Er.); *id. t. c.* p. 213.

The following synonymy is given by Schmidt, Deutsche e. Z. xxix. pp. 239–242:—*Sternaulax zelandica*, Mars. (= *lævis*, Shp.), *Platysoma restoratum*, Walk. (= *dohrni*, Mars.), *Platysoma* sp. (immature) (= *Hister cinnamomeus*, White), *Hister scævola*, Er. (= *mundissimus*, Walk.), *Platysoma deplanatum*, Gyll. (= *sibiricum*, Reitt.), *Saprinus immundus* var. (= *ægialius*, Reitt.), *Onthophilus exaratus*, Ill. (= *interruptus*, Reitt.), *Acritus minutus*, H. (= *balearicus*, Schauf., = *fulvus*, Mars.), *A seminulum*, Kust. (= *minutus*, Mars.), *Hister gehini*, Mars. (= *impressus*, Apetz), *H. funestus*, Er. (= *arenicola*, Th.), *H. inæqualis*,

Ol. (= *obliquatus*, Motsch.); also *Saprinus detersus*, (= *S. reticulata*, Motsch.), *S. chalcites*, Ill. (= *dubius*, Motsch., = *georgicus*, Mars.), *S. antiquulus*, Ill. (= *longistrius*, Mars.), *S. nitidulus*, Fab. (= *krynickii*, Kryn., and *punctatostriatus*, Mars.), *S. niger*, Motsch. (= *suturalis*, Motsch., and *gangeticus*, Mars.). *S. latipes*, Bon., and *Teretrius hispidulus*, Brem., to be deleted as incapable of recognition; Schm., Deutsche e. Z. xxix. pp. 443–444.

Saprinus elongatulus, Rosh., is probably *mocquerisi*, Mars., and has priority; *id. t. c.* p. 443.

Hetærius puberulus, Motsch. (= *Eretmotes palumboi*, Rag.); *id. t. c.* p. 442.

Hister præcox, Er., and *pusio*, Er., belong to *Phelister*; *id. t. c.* p. 241.

New genera and species :—

Ebonius, near *Omalodes*, for *E. politus*, Para, sp. n.; Lew., Ann. N. H. (5) xvi. p. 209.

Baconia, near *Phelister*, for *B. loricata*, and *patula*, Brazil, spp. nn.; *id. op. cit.* xv. pp. 462 & 463.

Teratosoma, for *T. longipes*, Brazil, sp. n.; *id. t. c.* p. 471.

Renia, near *Eretmotes*, for *R. meticulosa*, Parana, sp. n.; *id. t. c.* p. 467.

Triballodes, for *Triballus acritoides*, Reitt.; Schm., Deutsche e. Z. xxix. p. 442.

Satrapes, for *Eretmotes sartorii*, Redt., and *talychensis*, Reitt.; *id. t. c.* p. 441.

Ulkeus, near *Hetærius*, p. 142, for *U. intricatus*, sp. n., N. America; Horn, Tr. Am. Ent. Soc. xii. p. 143, pl. iv. figs. 9–11.

Idolia, near *Eletes*, for *I. lævigata*, p. 214, Honduras, *punctisternum*, p. 215, Brazil, spp. nn.; Lew., Ann. N. H. (5) xvi.

Niponius, g. n. (? near *Tryponæus*), p. 333, for *N. impressicollis*, pl. viii. figs. 1–11, *osorioceps*, figs. 12–14, *furcatus*, figs. 15–19, p. 333, *obtusiceps*, figs. 20–23, p. 334, spp. nn., all from Japan; *id.* Tr. E. Soc. 1885.

Hololepta pilipes, Borneo, *id.* Ann. N. H. (5) xv. p. 458; *æqua*, Assam, *id. op. cit.* xvi. p. 204, *prona*, Cape of Good Hope, *ibid.*, *maura*, Abyssinia, *sahlbergi*, Brazil, *belti*, Chontales, p. 205.

Lioderma nudum, Ashanti, *id. t. c.* p. 206.

Placodes ebeninus, Zanzibar, *id. op. cit.* xv. p. 458.

Apobletes esurialis, New Guinea, *cavatus*, Java, *id. t. c.* p. 459; *fictilius*, Gilolo, *id. op. cit.* xvi. p. 206.

Platysoma novum, Malabar, p. 459, *robestorfi*, Andaman Is., *planisternum*, Mysol, p. 460 (removed to *Apobletes*, *op. cit.* xvi. p. 207), *abyssinicum*, Abyssinia, *elingue*, Ceylon, p. 461, *directum*, Para, p. 462, *id. op. cit.* xv.; *punctulatum*, Assam, *id. op. cit.* xvi. p. 207, *sexstriatum*, Java, p. 207, *exiguum*, p. 208.

Pachycræus nigro-cæruleus, Abyssinia, *id. op. cit.* xv. p. 462; *bellulus*, Abyssinia, *id. op. cit.* xvi. p. 208.

Hister luciscus, Burmah, p. 463, *somali*, Somali-land, *metallicus*, India, p. 464, *castus*, El Hedjaz, *castaneus*, Chontales, p. 456, *id. op. cit.* xv.; *indicus*, Assam, *id. op. cit.* xvi. p. 209, *carnaticus*, Neilgherries, *martius*,

Cybocephalus viridi: 210, *occidentalis*, China, p. 211 ; *H. congener*, Japan, *hispanus*, Deutsche e. Z. xxix. p. 242.

Carcinops striatisternum, Ceylon, Lew., Ann. N. H. (5) xvi. p. 211.

Paromalus locellus, Sarawak, *oblisus*, Andaman Is., *commeatus*, Ceylon, *id. op. cit.* xv. p. 466; *P. simplicistrius*, Turkey, Schmidt, Deutsche e. Z. xxix. p. 237.

Hetœrius merklii, Turkey, *id. t. c.* p. 238 ; *H. incisus*, Spain, *id. t. c.* p. 440.

Celocrœra nitida, E. Africa, Lew., Ann. N. H. (5) xv. p. 467.

Triballus tropicus, Singapore, *montanus*, Ceylon, *id. op. cit.* xvi. p. 212.

Saprinus interpunctatus, p. 313, Sicily and Zanzibar, *fausti*, p. 314, Baku, Schmidt, B. E. Z. xxix.; *S. flavipennis*, Damaraland, Pering., Tr. S. Af. Soc. iii. p. 85.

Xenonychus altus, Egypt, Lew., Ann. N. H. (5) xv. p. 468.

Pachylopus ripæ, Japan, *id. t. c.* p. 469.

Tryponœus torpedo, Choutales, p. 469, *bombacis*, *vela*, p. 470, Ceylon, *id. t. c.*

Teretrius æstivus, Abyssinia, *id. t. c.* p. 470.

Homalopygus commensalis, Brazil, *id. t. c.* p. 471.

Chlamydopsis inquilina, Australia, *id. t. c.* p. 472.

Onthophilus foveipennis, Amur-land, p. 472, *hova*, Madagascar, p. 473, *id. t. c.* ; *tuberculisternum*, *bipartitus*, Zanzibar, *id. op. cit.* xvi. p. 213.

Acritus insularis, Oahu, Sharp, Tr. R. Dublin Soc. (2) iii. p. 129.

Æletes longipes, p. 129, pl. iv. fig. 13, *concentricus* and *facilis*, p. 130, Sharp, Oahu, *monticola*, Blkn., Maui, *t. c.*

Bacanius atomarius, Shp., p. 128, *confusus*, Blkn., p. 129, *t. c.*, Oahu.

Nitidulidæ.

[*Cf.* Reitter (269).]

Olliff, P. Linn. Soc. N. S. W. x. pp. 69–71, gives the following synonymy in reference to Walker's descriptions of Ceylon *Coleoptera*, assigned by him to this family:—*Carpophilus biguttatus*, Motsch., = *Nitidula contegens*, Walk ; *Nitidula intendens*, Walk., = *Haptoncus pubescens*, Murr. ; *N. significans*, Walk., = *H. tetragonus*, Murr. ; *N.* ? *tomentifera*, Walk., = *Œthriostoma undulata*, Motsch., *Dermestidæ* ; *Nitidulopsis æqualis*, Walk., = *Brachypeplus omalinus*, Murr. ; *Rhizophagus parallelus*, Walk., = *Nausibius dentatus*, Marsh., *Cucujidæ* ; *Nitidula submaculata*, Walk., = *Epuræa* sp. ; *Meligethes respondens*, Walk., = *Idæthina*, sub *Macroura*, *nigritula*, Reitt. Walker's *Tritoma bifacies* [*Diaperidæ*!] and his *Chilocorus opponens* [*Coccinellidæ*!] are both the same species of *Camptodes*, which Olliff proposes to call *Camptodes bifacies*, and which = *Camptodes ornatus*, Motsch.

Brachypterus liniariæ, St., = *laticollis*, Kust. ; *B. glaber*, Newm., = *meridionalis*, Kust. : Reitt., Wien. ent. Z. iv. p. 315.

Cychramus fungicola, ♂, = *alutaceus* ; *id. t. c.* p. 317.

Pallodes (*Sphœridium*) *unistriatum*, Beauv., = *silaceus*, Er. ; Horn, Am. Ent. i. p. 90.

Soronia punctatissima and *grisea* : characters noticed ; Goz., Rev. d'Ent. iv. p. 121.

Brachypeplus: notes on the classification of the Hawaiian species of; Blkn., Tr. R. Dublin Soc. (2) iii. pp. 138–141.

Rhizophagus cæruleus, nitidulus: characters of; Thoms., Bull. Soc. Ent. Fr. (6) v. p. cix.

New genus and species :—

Platynema, n. n. for *Orthogramma*, Murr. (*nec* Guenée), and *P. olliffi*, sp. n., Andaman Is.; Rits., Notes Leyd. Mus. vii. p. 29.

For *Cybocephalus* spp. nn., *cf. Silphidæ*.

Brachypterus (*Heterostomus*) *viliger*, South Europe, Reitt., Wien. ent. Z. iv. p. 316.

Amartus strobli, Mesopotamia, *id.* Deutsche e. Z. xxix. p. 376.

Brachyleptus aurosus, Turcomania, *id. t. c.* p. 377.

Heterostomus longulus, Portugal, *id. ibid.*

Cillæus apicatus, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 227, Madagascar.

Brachypeplus olinda, p. 132, *torcus, kælensis*, p. 133, *floricola*, p. 134, *quadraticollis, parallelus*, p. 135, *expers, spretus*, p. 136, *bicolor*, p. 137, Blkn., *celatus*, p. 134, *apertus*, p. 135, Shp., Hawaiian Arch., Tr. R. Dublin Soc. (2) iii.

Goniorycetus fugitivus, similis, Hawaiian Arch., Blkn., *t. c.* p. 131.

Rhizophagus erichsonii, gyllenhalli, spp. nn. (no locality given), confounded by previous observers with *R. parallelocollis*; Thoms., Bull. Soc. Ent. Fr. (6) v. p. cviii.

Trogositidæ.

Asana, g. n., near *Lipaspis*, for *Trogosita rhyzophagoides*, Walk.; Oll., P. Linn. Soc. N. S. W. x. p. 71.

Melambia pumila, sp. n., Burmah, Leveillé, Ann. Mus. Genov. (2) ii. p. 199.

Alindria australis, sp. n., S. Africa, Pering., Tr. S. Af. Soc. iii. p. 86.

Trogosita reitteri, sp. n., Columbia, Kirsch, B. E. Z. xxix. p. 207.

Colydiidæ.

[*Cf.* Sharp (313, 314).]

Sharp proposes to suppress the group *Colydiini*, uniting it and *Deretaphrini*, Horn, under the latter name; J. L. S. xxix. p. 60.

Sharp, *t. c.*, figures or notices the following known species or genera of this family :—*Dastarcus* (= *Pathodermus*, Fairm.), p. 59, note, *Pseudotarphius*, p. 63, *Colobicus emarginatus* var., p. 66, *Cicones*, p. 67, *Xuthia niponica*, Lew., p. 71, *Teredolæmus politus*, Lew., pl. iii. fig. 7, *Tarphiosoma*, Woll., p. 119, *Trachypholis erichsoni*, pl. vi. fig. 3, *Erotylathris*, p. 127, *Prolyctus*, p. 128, *P. bituberculatus*, pl. vi. fig. 9, *Pycnomerus alternans*, Reitt., pl. vi. fig. 7.

Neoplatus, n. n. for *Tarphisoma*, Motsch., *nec* Woll.; *id. t. c.* p. 119.

New genera and species :—

Optis, near *Endophlæus*, for *O. bicarinata*, sp. n., Borneo; Pasc., P. E. Soc. 1885, p. xiii.

Neotrichus, near *Diodesma*, p. 60, for *N. hispidus*, Japan, p. 61, pl. iii. fig. 1, and *N. serratus*, Ceylon, p. 117, pl. iv. fig. 1 ; Sharp, J. L. S. xix.

Sympanotus, near *Endophlœus*, for *S. pictus*, sp. n., Japan, *id. t. c.* p. 62, pl. iii. fig. 2.

Glyphocryptus, p. 63, near *Coxelus*, for *G. brevicollis*, Japan, sp. n., *id. t. c.* p. 64.

Labromimus, p. 64, near *Colobicus*, for *L. variegatus*, sp. n., p. 65, pl. iii. fig. 3, Japan, *id. t. c.*

Microvonus, near *Colobicus*, for *M. squalidus*, sp. n., Ceylon, pl. vi. fig. 2, p. 118, *id. t. c.*

Acolophus, near *Colobicus*, for *A. debilis*, Japan, sp. n., *id. t. c.* p. 66.

Trionus, near *Bitoma*, for *T. opacus*, sp. n., Japan, p. 70, pl. vi. fig. 4, *id. t. c.*

Cylindromicrus, near *Metopiestes*, for *C. gracilis*, sp. n., Japan, pl. iii. fig. 6, *id. t. c.* p. 73.

Teredolæmus, near *Teredus*, for *Teredus politus*, Lew. (pl. iii. fig. 7), and *T. guttatus*, Japan, p. 74, *similis*, Ceylon, p. 124, spp. nn., *id. t. c.*

Antibothrus, near *Bothrideres*, for *A. carinatus*, Ceylon, sp. n., *id. t. c.* p. 124.

Leptoglyphus, near *Bothrideres*, for *L. vittatus*, Japan, p 75, and *L. cristatus*, Ceylon, p. 125, spp. nn., *id. t. c.*

Ectomicrus, near *Cerylon*, p. 78, for *E. rugicollis*, p. 79, *pubens*, p. 80, Japan, *setosus*, *aper*, pl. vi. fig. 11, Ceylon, p. 129, spp. nn., *id. t. c.*

Pachylon, near *Cerylon*, for *P. gorhami*, Andaman Is., sp. n., *id. t. c.* p. 79, note.

Cautomus, near *Cerylon*, for *C. hystriculus*, Japan, pl. iii. fig. 10, sp. n., *id. t. c.* p. 82.

Thyroderus, near *Cerylon*, p. 82, for *T. porcatus*, p. 83, pl. iii. fig. 11, sp. n., Japan, *id. t. c.*

Ulonotus isostictus, New Zealand, Broun, N. Z. J. Sci. ii. p. 384.

Coxelus grossanus, New Zealand, *id. t. c.* p. 385 ; *C. humeridens*, Lebanon, Reitt., Deutsche e. Z. xxix. p. 392 ; *C. serratus*, California, Horn, Tr. Am. Ent. Soc. xii. p. 142.

Synchita dentata, p. 139, *obscura*, p. 140, N. America, *id. t. c.*

Ditoma quadricollis, N. America, *id. t. c.* p. 140.

Lasconotus vegrandis, p 140, *servus*, p. 141, N. America, *id. t. c.*

Eulachus hispidus, Oahu, Blkn., Tr. R. Dublin Soc. (2) iii. p. 141.

Endophlœus serratus, Japan, Sharp, J. L. S. xix. p. 61.

Tarphiosoma luridum, Ceylon, *id. t. c.* p. 119.

Colobicus granulosus, Japan, *id. t. c.* p 65.

Cicones oculatus, p. 67, *oblongus*, *niveus*, p. 68, *minimus*, *bitomoides*, p. 69, Japan, *minutus*, p. 121, Ceylon, *id. t. c.*

Xuthia parallela, Japan, p. 70, pl. vi. fig. 5, *id. t. c.*

Ithris sculpturata, Japan, p. 72, pl. iii. fig. 4, *oculata*, Ceylon, p. 122, *id. t. c.*

Gempylodes lewisii, Japan, p. 72, pl. iii. fig. 5, *id. t. c.*

Metopiestes tubulus, Ceylon, p. 123, pl. vi. fig. 6, *id. t. c.*

Erotylathris costatus, Japan, p. 75, pl. iii. fig 8, *cognatus*, Ceylon, p. 127, *id. t. c.*

Dastarcus longulus, Japan, p. 76, pl. iii. fig. 6, Sharp, J. L. S. xix.

Pycnomerus vilis, *sculpturatus*, p. 77, Japan, *distans*, Ceylon, p. 129, pl. vi. fig. 8, *id. t. c.*; *P. arboreus*, New Zealand, Broun, N. Z. J. Sci. ii. p. 385.

Philothermus depressus, Japan, p. 78, Sharp, *t. c.*

Cerylon crassipes, p. 80, *minimum*, *curticolle*, p. 81, Japan, *gracilipes*, *tibiale*, p. 130, *quadricolle*, p. 131, Ceylon, *id. t. c.*

Cossyphodes woodrooffei, S. Africa, Pering., Tr. S. Af. Soc. iii. p. 87.

Rhysodidæ.

Rhysodes lignarius, N. S. Wales, sp. n., Oll., P. Linn. Soc. N. S. W. x. p. 471.

Cucujidæ.

[*Cf.* Olliff (233).]

Silvanus surinamensis, L. Habits and food discussed; Ent. Nachr. xi. p. 139.

The following synonymy is given by Oll., P. Linn. Soc. N. S. W. x. pp. 203–224: *Hectarthrum brevifossum*, Newm. (= *cylindricum*, Sm., = *australicum*, Wat.); *Ipsaphes nitidulus*, Macl., is a heteromerous insect near *Sitophagus*; *Brontes lucius*, Pasc. (= *nigricans*, Pasc.); *Silvanus castaneus*, Macl. (? = *inæqualis*, Grouv.). And also *Cucujus ? incommodus*, Walk. (= *Psammœcus trimaculatus*, Motsch., = *P. breviusculus*, Reitt., = *Telephanus cruciger*, Waterh.) · Oll., *t. c.* p. 71.

New genus and species :—

Brontolæmus, for *B. elegans*, sp. n., Hawaiian Arch.; Sharp, Tr. R. Dublin Soc. (2) iii. p. 142, pl. iv. fig. 16.

Passandra deyrollei, Australia, *waterhousei*, Abyssinia, Grouv., Bull. Soc. Ent. Fr. (6) v. p. xxxi.

Hectarthrum apicale, Senegal, *id. t. c.* p. xxxii.

Cucujus coloniarius, Australia, Oll., P. Linn. Soc. N. S. W. x. p. 207.

Ipsaphes bicolor, Australia, *id. t. c.* p. 209.

Brontes macleayi, Australia, *id. t. c.* p. 218.

Læmophlœus amabilis, p. 211, *ramsayi*, p. 212, *articeps*, p. 213, *conterminus*, p. 214, *rigidus*, p. 216, *macleayi* (= *Placonotus longicornis*, Macl.), p. 216, *id. t. c.*; *L. insularis*, Sumatra, Grouv., Notes Leyd. Mus. vii. p. 47, pl. iv. fig. 1; *L. æneus*, Maui, Sharp, Tr. R. Dublin Soc. (2) iii. p. 143.

Telephanus insularis, Sharp, p. 143, *pallidipennis*, Blkn., Hawaiian Is., *t. c.*

Cryptamorpha optata, Tasmania, Oll., P. Linn. Soc. N. S. W. x. p. 221.

Silvanus congener, Australia, *id. t. c.* p. 223; *S. javanicus*, Java, Grouv., Notes Leyd. Mus. vii. p. 48, pl. iv. fig. 2.

Moanus brevicornis, Hawaiian Arch., Blkn., *t. c.* (*M. crenatus* figured, *t. c.* pl. iv. fig. 15.)

Cryptophagidæ.

Atomaria gutta (= *godarti*, Guil.); Reitt., Wien. ent. Z. iv. p. 317.

Cryptophagus beringensis, Tschuktscha Penins., sp. n., Sahl., Veg. exp. Vet. iv. p. 29.

Telmatophilus debilis, Oahu, sp. n., Sharp, Tr. R. Dublin Soc. (2) iii. p. 145.

Tomarus pilifer, Caucasus, sp. n., Reitt., Wien. ent. Z. iv. p. 315.

Lathridiidæ.

[*Cf.* Belon (22, 23).]

Belon, Rev. d'Ent. iv., describes or comments on *Neoplotera peregrina*, Bel., descr. gen. et spec. p. 239, *Reitteria lucifuga*, *Merophysia cretica* and *carinulata*, p. 240, *Holoparamecus similis*, Bel. (*cf. infrà*), p. 242, *Anommatus basalis*, Reitt., and *pusillus*, Schf., p. 243, *kiesenwetteri*, p. 244, *Metopthalmus raffrayi*, Bel. (*cf. infrà*), p. 245, *Lathridius constrictus*, p. 248, *Enicmus dubius*, p. 249, *Revelieria genei*, p. 250.

Cartodere costulata, Reitt., is redescribed from Germany; Wien. ent. Z. iv. p. 314.

New genus and species :—

Neoplotera, for *N. peregrina*, sp. n., France, Bel., Rev. d'Ent. iv. p. 239.

Merophysia madoni, Cyprus, *id. t. c.* p. 241.

Holoparamecus dispar, Brazil, *id. t. c.* p. 242.

Metophthalmus raffrayi and *Holoparamecus similis*, Aden, spp. nn., provisionally and informally characterized; Belon, Bull. Soc. Ent. Fr. (6) v. p. xxxix.

Enicmus alutaceus, Amur-land, Reitt., Deutsche e. Z. xxix. p. 305.

Abromus abeillei, Spain, Belon, Rev. d'Ent. iv. p. 244.

Lathridius humeralis, p. 246, *dimidiatus*, *fortuitus*, p. 247, Chili, *id. t. c.*

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Dermestidæ.

Anthrenus, habits of; Bull. Soc. Metz (2) vi. p. 7.

Cryptorhopalum brevicorne, *terminale*, spp. nn., Oahu, Sharp, Tr. R. Dublin Soc. (2) iii. p. 150.

Attagenus lætus, *jucundus*, p. 88, *floralis*, p. 89, S. Africa, Pering., Tr. S. Af. Soc. iii.; *A. plebeius*, Honolulu, Sharp, *t. c.* p. 147.

Labrocerus, g. n., near *Attagenus*, for *L. jaynei*, p. 148, *concolor*, p. 149, Sharp, and *obscurus*, Blkn., p. 149, *t. c.*, Hawaiian Arch.

Byrrhidæ.

Abnormal antenna in *Byrrhus pilula*; Chatin, Bull. Soc. Philom. (7) ix. p. 132.

Pseudonosoderma, g. n., near *Nosoderma*, p. 305, for *P. amurense*, sp. n., Amur-land, p. 306 ; Heyd., Deutsche e. Z. xxix. p. 307.

Morychastes, g. n., Fairm., Ann. Soc. Ent. Fr. (6) v. p. 43, for *Byrrhus australis*, Blanch.

Brachmys, g. n., near *Amphicyrta*, *id. t. c.* p. 44, for *B. puberulus*, sp. n., *t. c.* p. 45, New Year Sound.

Parnidæ.

Parnus pubescens, Blanch. (= *Dryops corpulentus*, Reitt.) ; Berg, Bull. Soc. Ent. Fr. (6) iv. p. cxxx.

Dryops (*Pomatinus*) *argentinus*, sp. n., Buenos Aires, *id.* An. Soc Arg. xix. p. 223.

Helichus cordubensis, sp. n., Cordoba, *id. t. c.* p. 224.

Hydora nitida, *obsoleta*, spp. nn., New Zealand, Broun, N. Z. J. Sci. ii. p. 385.

Latelmis insignis, sp. n., Caucasus, Reitt., Deutsche e. Z. xxii. p. 364.

Heteroceridæ.

Heterocerus. Note on the characters and nomenclature of the sections of ; Goz., Rev. d'Ent. iv. pp. 118–121.

Lucanidæ.

[*Cf.* Leuthner (191) ; Macleay (202).]

Abnormal specimen of *Lucanus cervus* ; Ent. Am. i. p. 27.

Neolucanus lama, Ol. (= *baladeva*, Hope), and *latipennis*, Hope (= *dejeani*, Reiche) ; *Odontolabis alces*, Fab. (= *dux*, West.) ; *siva*, Hope (= *carinatus*, auct.) ; *camelus*, Ol. (= *gouberti*, Waterh.) ; *sinensis*, West. (= *gazella*, auct.) ; *gazella*, Fab. (= *bicolor*, Ol.) ; *carinatus*, L. (= *nigritus*, Deyr.) : Leuth., Tr. Z. S. xi. p. 486.

Cladognathus occipitalis, Hope, *Odontolabis alces* and *bellicosa* noticed from Celebes ; Schauf., Hor. Ent. Ross. xix. p. 185.

Eurytrachelus arfakianus, Lansb., recorded from Queensland ; Ann. N. H. (5) xv. p. 342.

Gnaphaloryx aper, Gest., and *curtus*, Kirsch. Note on specific characters of ; Albers, Deutsche e. Z. xxix. pp. 232–236.

Figulus decipiens, Albers. Corrected tabulation of this and allies ; Deutsche e. Z. xxix. p. 248.

Metallactulus, n. n. for *Metallactus*, Alb. ; Rits., Notes Leyd. Mus. vii. p. 54.

Table of N. American species of *Platycerus*, by Casey, Bull. Cal. Ac. Sci. i. p. 332.

Platycerus agassii, Lec. Sexual characters of ; Tr. Am. Ent. Soc. xii. p. 169.

New genera and species :—

Phalacrognathus, for *Lamprima muelleri*, sp. n., *infrà* ; Mac., P. Linn. Soc. N. S. W. x. p. 473 : ♂ described, *t. c.* p. 474.

Homolamprima, for *H. crenulata*, sp. n., New South Wales; Macl., l. c. pp. 199 & 200.

Lamprima muelleri, p. 135, *insularis* (Lord Howe I.), *nigripennis*, p. 137, *violacea*, *minima*, p. 138, Australia, *id. t. c.*

Neolamprima mandibularis, Queensland, *id. t. c.* p. 139.

Rhyssonotus laticeps, Australia, *id. t. c.* p. 201.

Neolucanus lansbergii, Sumatra, p. 421, pl. lxxxiv. fig. 4, *pallescens*, China, p. 426, pl. lxxxv. fig. 2, *parryi*, China, Laos, p. 424, pl. lxxxv. fig. 4, *oberthueri*, China, p. 429, Leuth., Tr. Z. S. xi.

Odontolabis celebensis, Celebes, p. 442, pl. lxxxviii. figs. 6–8, *fratellus*, Manilla, p. 472, pl. xcvi. figs. 5 & 6, *id. t. c.*

Gnapholoryx perforatus, Sumatra, Rits., Notes Leyd. Mus. vii. p. 39, pl. iii. figs. 1, 1 *a*, & 1 *b*.

Ceratognathus (*Mitophyllus*) *gibbosus*, New Zealand, Broun, N. Z. J. Sci. ii. p. 385.

Platycerus californicus, Casey, Bull. Cal. Ac. Sci. i. p. 331.

Passalidæ.

Passalus transversus, Dalm. Larva and pupa described; Lucas, Bull. Soc. Ent. Fr. (6) v. p. lxxiii.

Leptaulax macassariensis, p. 186, *ursulus*, p. 187, Celebes, spp. nn., Schauf., Hor. Ent. Ross. xix.

Eriocnemis gelon, sp. n., Celebes, *id. t. c.*

Pertinax æquatorialis, sp. n., Columbia, Kirsch, B. E. Z. xxix. p. 208.

Petrejus alticola, sp. n., Ecuador, *id. t. c.* p. 209.

Popilius depressicornis, sp. n., Ecuador, *id. ibid.*

Scarabæidæ.

[*Cf.* Horn (148).]

Coprides.

[*Cf.* Lansberge (182).]

Ateuchus semipunctatus, note on habits of; Pouj., Bull. Soc. Ent. Fr. (6) v. p. cix.

Canthon. Table of N. American species of; Blanch., Tr. Am. Ent. Soc. xii. p. 163.

Phanæus. Table of N. American species of; *id. t. c.* p. 167.

Chæridium. Note on some N. American species of; *id. t. c.* p. 170.

Copris procidua, Say, in the United States; *id. t. c.* p. 171.

Heliocopris bucephalus, Fab., pupa of, described; Lucas, Bull. Soc. Ent. Fr. (6) v. p. xxiii.

Onthophagus suturellus, Br. (= *trochyscobius*, Kol.); Reitt., Wien. ent. Z. iv. p. 276.

New species.

Scarabæus cribricollis, Kilima-njaro, Waterh., P. Z. S. 1885, p. 231, pl. xv. fig. 1; *S. thomsoni*, Masai, *id.* Ann. N. H. (5) xv. p. 377.

Deltochilum haroldi, Columbia, Kirsch, B. E. Z. xxix. p. 211.

Temnoplectron æneolum, New Guinea, Lansb., Ann. Mus. Genov. (2) ii. p. 375.

Tesserodon gestroi, Cape York, p. 375, *elongatum*, New Guinea, p. 376, *id. t. c.*

Platyphymatia tuberculata, Mt. Ernest I., Torres Straits, *id. t. c.* p. 376.

Cassolus sumatranus, Sumatra, *id. t. c.* p. 377.

Catharsius quadridentatus, Burmah, *id. t. c.* p. 392.

Coptodactyla papua, New Guinea, *id. t. c.* p. 393.

Copris tiberius, Celebes, Schauf., Hor. Ent. Ross. xix. p. 188; *C. curvifrons*, Limpopo Riv., Pering., Tr. S. Af. Soc. iii. p. 89.

Pinotus acuminiger, Columbia, Kirsch, B. E. Z. xxix. p. 210.

Onthophagus centurio, New Guinea, p. 378, *occipitalis*, p. 379, *hastifer*, p. 380, *gibbicollis*, p. 381, *comottoi*, p. 382, and *heterorrhinus*, p. 383, Burmah, *riparius*, p. 384, and *investigator*, p. 385, New Guinea, *scatonomoides*, p. 386, Sumatra, *orbicularis*, p. 387, and *viduus*, p. 388, New Guinea, *decurio*, p. 389, Cape York, *griseoæneus*, p. 390, Celebes, *aspericollis*, New Guinea, and *granum*, Cape York, p. 391, Lansb., Ann. Mus. Genov. (2) ii.; *O. pacificus*, p. 18, *deliensis*, Sumatra, *forsteni*, Celebes, p. 18, *id.* Notes Leyd. Mus. vii.; *O. bradshawi*, Zambesi, Pering., Tr. S. Af. Soc. iii. p. 90; *O. johnstoni*, Kilima-njaro, Waterh., P. Z. S. 1885, p. 232, pl. xv. fig. 2.

Phalops rufo-signatus, S. Africa, Lansb., Notes Leyd. Mus. vii. p. 19.

Aphodiides.

Aphodius prodromus and *punctato-sulcatus*. Note on their differential characters; De Borre, Mat. Hainaut, iii. pp. 35–38.

Colobopterus erraticus, aberr. of; Rev. d'Ent. iv. p. 121. *Aphodius fœtus, immundus*, and allies; characters of, tabulated; *t. c.* p. 122.

Aphodius nigro-signatus, Zambezi, sp. n., Pering., Tr. S. Af. Soc. iii. p. 91.

Pleurophorus ovipennis, Bône, sp. n., Desb., Col. Nord. Afr. ii. p. 98.

Hybosorides.

Phæochrus suturalis, Burmah, sp. n., Lansb., Ann. Mus. Genov. (2) ii. p. 394.

Geotrupides.

Lethrus cephalotes, Fab. Metamorphoses described and figured; Emich, Math. Nat. Ber. Ung. ii. p. 184, pl. viii.

Lethrus dinotherium, sp. n., Fergana, Wilkins, Hor. Ent. Ross. xix. p. 292.

Bolboceras multicostatus, New Guinea, *birmanicus*, p. 395, *consanguineus*, p. 396, Burmah, spp. nn., Lansb., Ann. Mus. Genov. (2) ii.

Trogides.

Glaresis mendica, inducta, spp. nn., N. America, Horn, Tr. Am. Ent. Soc. xii. p. 117.

Liparochrus multistriatus, Har. (= *crenulatus*, Fairm.); Lansb., Ann. Mus. Genov. (2) ii. p. 398. *L. papuus*, N. Guinea, *pimelioides*, Cape York, spp. nn., *id. t. c.* p. 397.

Synarmostes pulcher, Sumatra, *id. t. c.* p. 398; *S. latericostatus*, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 227, Madagascar; spp. nn.

Glaphyrides.

Glaphyrus opulentus, sp. n., Bedel, Ann. Soc. Ent. Fr. (6) iv. p. 249, Algeria.

Melolonthides.

Hoplia trifasciata, Say. Variation in; Tr. Am. Ent. Soc. xii. p. 171.

Hypotrichia spissipes, Lec. Description of ♀, and note on habits of; Psyche, iv. p. 215.

Plectrodes palpalis. Characters of ♀; Horn, Tr. Am. Ent. Soc. xii. p. 119.

Amphimallus and *Rhizotrogus* to be united; Goz., Rev. d'Ent. iv. p. 123.

Rhizotrogus inundationis, Raffr., is the female of *R. amphytus*, Buq.; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 86.

Varieties of European species of *Melolontha*; *cf.* Kraatz (174).

New species:—

Hoplia uniformis, p. 377, *nigrina*, p. 378, Greece, Reitt., Deutsche e. Z. xxix.

Anisochelus gnomicus, p. 190, *ornatus*, with varr. *plagiatus*, *castaneus*, *pachypodoides*, p. 191, Celebes, Schauf., Hor. Ent. Ross. xix.

Lepitrix hirtipes, Namaqualand, Pering., Tr. S. Af. Soc. iii. p. 93.

Monochelus natalensis, Natal, p. 93, *M.* (*Heterochelus*) *pulcher*, p. 94, Transvaal, *id. t. c.*

Scelophysa trimeni, Namaqualand, *id. t. c.* p. 95.

Gymnoloma festiva, S. Africa, *id. ibid.*

Hymenoplia neydeni [*sic*], Oran, Desb., Col. Nord. Afr. ii. p. 98.

Odontria sandageri, New Zealand, Broun, N. Z. J. Sci. ii. p. 385.

Astæna foveicollis, p. 212, *pilosella*, p. 213, *pygidialis*, p. 214, Colombia, *æquatorialis*, p. 213, Ecuador, Kirsch, B. E. Z. xxix.

Clavipalpus blanchardi, Colombia, *sinuatus*, p. 215, *hirsutus*, p. 216, Ecuador, *id. t. c.*

Philochlænia anomala, *micans*, Ecuador, p. 217, *id. t. c.*

Macrodactylus thoracicus, Ecuador, p. 218, *æneus*, Bolivia, *felix*, Colombia, p. 219, *id. t. c.*

Lachnosterna rufiventris, Ecuador, *id. t. c.* p. 220.

Phytalus cephalicus, *robustus*, p. 120, *pallidus*, *vexatus*, p. 121, *debilis*, *georgianus*, p. 122, N. America, Horn, Tr. Am. Ent. Soc. xii.

Listrochelus flavipennis, *gracilis*, N. America, *id. t. c.* p. 123.

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Phyllopertha forbesi. Table of the species of the Mediterranean region; Reitt., Deutsche ix. p. 393. *P. lineolata*, Fab. (= *P. algerica*, Reiche., = *P. oberthuri*, Brenske.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 86.

Anomala smaragdina (= *A. morissæi*, Bl.); Dohrn, S. E. Z. xlvi. p. 139. *A. varians* destroying wheat crops; Riley, Rep. Ent. 1884, p. 412.

Antichira catomelæna, Dohrn, probably identical with *A. rufipes*, Kirsch ; Dohrn, S. E. Z. xlvi. p. 79.

Cœlidia marginata, Boisd. (= *Parastasia zoraidæ*, Gestro), and *P. rugosicollis*, Blanch. (= *P. degenerata*, Voll.) ; Rits., Notes Leyd. Mus. vii. p. 16.

Aglycoptera, g. n., near *Pelidnota*, for *A. lacerdæ*, Bahia, sp. u. ; Sharp, C.R. ent. Belg. 1885, p. xxiii. : but the species is *Pelidnota burmeisteri*, Burm., which was erroneously supposed to be from Guatemala ; Fairm., *t. c.* p. xxxix.

Phyllopertha ganglbaueri, hab. ?, sp. n., Reitt., Deutsche e. Z. xxix. p. 396.

Anomala (*Spilota*) *puncticollis*, Ecuador, sp. n., Kirsch, B. E. Z. xxix. p. 220.

Chlorota flavofemorata, Ecuador, sp. n., *id. t. c.* p. 221.

Odontognathus striatopunctatus, Bolivia, sp. n., *id. t. c.* p. 222.

Plusiotis woodii, Texas, sp. n., Horn, Tr. Am. Ent. Soc. xii. p. 124.

Dynastides.

Pentodon variolopunctatus, Fairm. (= *P. pygidialis*, Kr.) ; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 86.

Vertumnus cuniculus, Burm., found in Algeria ; Fairm., Bull. Soc. Ent. Fr. (6) v. p. viii.

Xyloryctes satyrus and *Strategus antæus*. Northern limit of distribution ; Canad. Ent. xvii. pp. 39, 40, & 58.

Note on *Dynastes* sp., stating that the thoracic horn is used for exciting a flow of sap to procure food ; Bull. Brooklyn Soc. vii. p. 120.

Alcidosoma siamensis, from Chantaboun, noticed ; Lucas, Bull. Soc. Ent. Fr. (6) v. p. cv.

Cyclocephala atacazo, Ecuador, sp. n , Kirsch, B. E. Z. xxix. p. 223.

Megacerus stubellii, Brazil, sp. n., *id. ibid.* pl. ix.*c.*

Orizabus snowii, p. 124, pl. iv. fig. 5, *ligyroides*, p. 125, fig. 6, N. America, spp. nn., Horn, Tr. Am. Ent. Soc. xii.

Xylotrupes lorquini (Deyr.), Moluccas, p. 194, *clinias*, p. 192, *baumeisteri*, p. 193, Celebes, *beckeri*, Singapore, p. 193, spp. nn., Schauf., Hor. Ent. Ross. xix.

Cetoniides.

[*Cf.* Bergé (24, 25), Blanchard (35), Janson (157), Kraatz (175–178).]

Goliathus albosignatus, Boh., note on ; Kr., Deutsche e. Z. xxix. p. 17.

Clithria cucnemis, Burm., recharacterized, and var. n. *nigricollis* described ; *id. t. c.* p. 74.

Clerota budda. *Macronota vitigera*, West., is certainly variety of ; Dohrn, S. E. Z. xlvi. p. 143.

Lomaptera. Ueber den systematischen Werth der Forceps-bildung bei den mit *Lomaptera* verwandten Gattungen ; Kr., De[illegible] Z. xxix. pp. 349–352, pl. v. (pt.) : refers to *Lomaptera*, *Ischiopsorn*, Tr. *Baumastopeus*, and *Agestrata* : he considers that this organ [illegible] only of great importance in all the orders of insects for the discrimination of species, but may afford valuable generic characters. *L. validipes* var. *lansbergei*, Kr., = (*L. xanthopus*, Gest., *validipes*, Wall., in parte) ; *id. t. c.* pp. 82–84.

Agestrata. Variations of the species, and difficulty of defining the latter; Bergé, Ann. Ent. Belg. xxix. 2, pp. 11–14.

Heterorrhina africana (= *H. infuscata*, Voll.), *Gymnetis liturata* (= *G. hamata*, Fauv.), *Glycyphana fulvistemma*, Mots. (= *Euryomia sieboldi*, Voll.); Rits., Notes Leyd. Mus. vii. p. 16. *H. malayana*, Wall. figured; Waterh., Aid, iii. pl. cliii. fig. 5.

Note on the characters of *Melinesthes*, and on *M. umbonata* and *M. elongata*; Jans., Cist. Ent. iii. p. 139. *Heterorrhina picturata*, Har., does not belong to this genus, but to *Chondrorrhina*; *id. t. c.* p. 140.

Glycyphana aromatica var. n. *contristrata*, Ternate, p. 77; *rufovittata*, Wall., var. *melanaria*, Nias I., p. 80: *id. t. c.* Suggestion that *G. rufovittata*, Wall., is not really the same as *rufovittata*, Guer., and the name *vittata* proposed for the former should this supposition prove correct; Kr., Deutsche e. Z. xxix. *G. papua*, Wall.: of this, *G. fallaciosa*, Kr., and *pulchra*, Macl., are varieties; *id. t. c.* p. 92. A variety of *G. fallaciosa* figd., pl. i. fig. 4, as *G. lateraria*.

Cetonia ciliata, Ol., ♂ (= *porcina*, Wall.); *Glycyphana andamanensis*, Jans. (= *Euryomia andamana*, Th.); *Leucocelis helenæ*, Sch. (= *collaris*, Har., = *cinctipennis*, Lansb.): Kr., Deutsche e. Z. xxix. p. 15.

Pachnoda sinuata, Fab. *P. flaviventris* (= *calceata*, Har.), Gory, and *P. frontalis*, Harold, are varieties of this; many varieties described and named, pp. 341–348, and figured on pl. v.: *id. t. c.*

Allorhina mutabilis and *nitida*. Differential characters of; Tr. Am. Ent. Soc. xii. p. 172.

Euphoria subtomentosa and *leucographa*. Occurrence in United States of N. America; *ibid.*

Gnorimus variabilis, L. Discussion as to habits; Ent. Nachr. xi. pp. 34, 124, & 310–316.

New genera, new species, and some new varieties :—

Microlomaptera, near *Lomaptera* and *Digenethle*, p. 87, for *M. ænea*, sp. n., Aru Is., p. 88, pl. i. fig. 5; Kr., Deutsche e. Z. xxix.

Dichrosoma, p. 89, near *Sternoplus*, for *D. lansbergei*, sp. n., Aru Is., p. 90, pl. i. figs. 6 & 6a; *id. t. c.*

Thamastopeus, for *Lomaptera pulla*, &c.; *id.* Ber. Brenske, xvii. 1883, pp. 27 & 28 [*cf.* Deutsche e. Z. xxix. p. 350, note].

Ischnostoma picta, p. 96, pl. i. fig. 7, *albonotata*, p. 97, Transvaal, Pering., Tr. S. Af. Soc. iii.

Lomaptera gilnickii (Deyr., in litt.?), *ribbei*, Aru Is., Kr., Deutsche e. Z. xxix. p. 85.

Digenethle spilophora var. *nigerrima*, Aru Is., *id. t. c.* p. 86.

Clithria bicostata (? *cucnemis*, ♀), no locality, p. 75, pl. i. fig. 3, *albersi*, N. Australia, p. 75, pl. i. fig. 1 ♂, fig. 2 ♀, *id. t. c.*

Clinteria forbesi, Timor, Jans., in Forbes' "Naturalist's Wanderings," p. 496.

Macronota tricolor, Mohn., varr. *bispilota* and *lucernæ*, *Cetonia celebica* var. *obscura*, from Celebes, Schauf., Hor. Ent. Ross. xix. pp. 195–198.

Glycyphana regalis var. *nickerli*, *G. celebensis* varr. *thoracica*, *elegantula*,

Schauf., *t. c.* p. 194; *G. rufo-picta*, New Britain, *bisignata*, Nias I., p. 78, *bimaculata*, Andaman Is., p. 79, Kraatz, Deutsche e. Z. xxix.

Cetonia (?) *strigicollis*, Sumatra, *id. t. c.* p. 246, pl. i. fig. 7, allied to *C.? mixta*, Fab., which is also described, p. 245, and figured, fig. 8; *C. vetusta*, Sumatra, Rits., Notes Leyd. Mus. vii. p. 123; *C.* (*Trichostetha*) *placida* var. n. *algoensis*, Delagoa Bay, Pering., Tr. S. Af. Soc. iii. p. 98; *C. scutellaris*, Celebes, Schauf., Hor. Ent. Ross. xix. p. 198; *C. aurata* var. n. *oertzeni*, Crete, Reitt., Deutsche e. Z. xxix. p. 379.

Protætia hageni, Sumatra, Rits., Notes Leyd. Mus. vii. p. 124, pl. iv. fig. 4; *P. indecora*, Aru Is., Kr., Deutsche e. Z. xxix. p. 91.

Pachnoda nachtigali, Congo, *id. t. c.* p. 247, pl. i. fig. 9.

Argyripa subfasciata, probably from New Grenada, Rits., Notes Leyd. Mus. vii. p. 41, pl. iii. fig. 2.

Porphyrhyba raffrayi, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 235 (*P. chalybeata*, *id.* p. 236), spp. nn., Madagascar. *P. chalybeata* is same species as *P. raffrayi*, and the latter name to stand; Fairm., *op. cit.* p. 242.

Melinesthes calcipes, p. 140, *hamula*, *exilis*, p. 141, Natal, *serripes*, p. 142, E. Africa, Jans., Cist. Ent. iii.

Gnathocera hyacinthina, p. 143, Nyamnyams, *pubescens*, p. 144, *marginata*, p. 145, Congo, *id. t. c.*

Desicasta metallica, Costa Rica, *id. t. c.* p. 147.

Anochilia incilis, Madagascar, *id. ibid.*

Coptomia villosula, Madagascar, *id. t. c.* p. 148.

Schizorrhina (*Diaphonia*) *jansoni*, W. Australia, Oll., Cist. Ent. iii. p. 147.

Ptychophorus rubronotatus, Delagoa Bay, Pering., Tr. S. Af. Soc. iii. p. 99.

Cremastochilus spinifer, p. 126, pl. iv. fig. 1, *planipes*, fig. 2, *ineptus*, fig. 3, p. 127, N. America, Horn, Tr. Am. Ent. Soc. xii. p. 127.

Myoderma rufa, Zululand, Waterh., Ann. N. H. (5) xv. p. 379, Africa [*cf.* Gest., Ann. Mus. Genov. (2) ii. pp. 179 & 534].

Stringophorus morulus, Old Calabar, Jans., Cist. Ent. iii. p. 150.

Incala nubila, p. 149, *resima*, p. 150, W. Africa, *id. t. c.*

Clastocnemis simulus, W. Africa, *id. t. c.* p. 151.

Trichius japonicus, Japan, *id. t. c.* p. 152.

Agenius grandis, *namaquensis*, Namaqualand, p. 100, *plagosus*, Transvaal, p. 101, Pering., Tr. S. Af. Soc. iii.; *A. suturalis*, Cape of Good Hope, Waterh., Ann. N. H. (5) xv. p. 379.

Calometopus (?) *planatus*, Kilima-njaro, *id.* P. Z. S. 1885, p. 233, pl. xv. fig. 3.

Buprestidæ.

[Catalogue of, *cf.* Kerremans (163).]

Chrysodema lambii, Saund., *Coræbus pascoei*, Saund, figured by Waterhouse, Aid, iii. pl. cliii. figs. 6 & 8.

Chalcophora virginica, Drury, recorded from Guatemala; Dohrn, S. E. Z. xlvi. p. 142.

Cyphogastra javanica (= *C. splendens*, Wat.). The species is not Javanese, but from the Aru Islands and Timor-Laut ; Rits., Notes Leyd. Mus. vii. p. 16.

Psiloptera ornata (= *impressa*, Burm.) ; Berg, Bull. Soc. Ent. Fr. (6) v. p. civ.

Chrysobothris. Buprestis desmaresti, Cast. (= *Psiloptera desmaresti*, Cat. Gemm. Har., = *Chrysobothris maxima*, Burm.), to be assigned to this genus ; *id. op. cit.* iv. p. cxxx.

Tylauchenia, Burm. *Ptosima irrorata*, Gory (*attenuata*, Fairm.) to be assigned to this ; *id. ibid.*

Melanophila. The forgotten *Buprestis nigrita*, Fab., Supp. Ent. Syst. p. 133, is certainly a species of the "*acuminata*, Deg., group" of this genus ; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 86.

Dystaxia lecontei, Thoms., noticed ; Horn, Tr. Am. Ent. Soc. xii. p. 146.

Anthaxia. Table of species of the *Cratomerus* group ; Gangl., Deutsche e. Z. xxix. pp. 317–320. *A. bimaculata*, Gory (= *Anthaxia debilipennis*, Steinl., = *Curis hemiptera*, Burm.), belongs rather to *Curis* than to *Anthaxia*, but the two genera are difficult to separate ; Berg, Bull. Soc. Ent. Fr. (6) iv. p. cxxx. *A. orientalis*, Burm., is a species of *Melanophila* ; *id. op. cit.* v. p. civ.

Dactylozodes jucundissima (= *cribricollis*, Fairm.) ; *id. ibid.*

Kisanthobia ariasi, Rob. Habitat and habits ; Rev. d'Ent. iv. p. 155.

Habits of *Corœbus bifasciatus*, Ol. ; Paszlavszky, Rov. Lapok, ii. pp. 232–238, fig. 21, & Suppl. p. xxix.

Agrilus frigidus and *insanus*, Gory, are one species ; Berg, Bull. Soc. Ent. Fr. (6) v. p. civ. *A. insanus*, Gory (= *A. mendozanus*, Stein.) ; *id. op. cit.* iv. p. cxxx.

Cylindromorphus parallelus. Habits of ; Rev. d'Ent. iv. p. 156.

New species :—

Amblysterna johnstoni, Kilima-njaro, Waterhouse, P. Z. S. 1885, p. 233, pl. xv. fig. 4.

Julodis gariepina, Orange Riv., Pering., Tr. S. Af. Soc. iii. p. 101, pl. i. fig. 8.

Chrysochroa lata, Celebes, Schauf., Hor. Ent. Ross. xix. p. 199.

Chrysodema occulta, p. 379, Solomon Is., *brownii*, p. 380, Duke of York I., *ventralis*, p. 381, Ladrone Is., Waterh., Ann. N. H. (5) xv.

Cyphogastra reidelii, Timor Laut, Aru, *æripennis*, Amboyna, p. 113, *auriventris*, Duke of York I., p. 114, Kirsch, B. E. Z. xxix. ; *C. terminata*, Solomon Is., *abdominalis*, Duke of York I., p. 381, *macfarlani*, Murray I., *sodalis*, Cornwallis I., p. 382, Waterh., Ann. N. H. (5) xv.

Halecia gentilis, Texas and Mexico, Horn, Tr. Am. Ent. Soc. xii. p. 141.

Psiloptera lata, Kilima-njaro, Waterh., P. Z. S. 1885, p. 234, pl. xv. fig. 5 ; *P. comottoi* (Burmah, probably), Lansb., Ann. Mus. Genov. (2) ii. p. 399.

Schizopus sallei, California, Horn, Tr. Am. Ent. Soc. xii. p. 145, pl. iv. fig. 14.

Anthaxia eugeniæ, p. 317, *kruperi*, p. 319, Smyrna, Gangl., Deutsche e. Z. xxix.

Calodema ribbei, Aru Is., Poll., Notes Leyd. Mus. vii. p. 31, pl. iii. fig. 5.

Tyndaris cincta, Texas, Horn, Tr. Am. Ent. Soc. xii. p. 147, pl. iv fig. 13.

Ptosima patagiata, Buenos Aires, Berg, An. Soc. Arg. xix. p. 225.

Acmœodera lata, Turkestan, Heyd., Deutsche e. Z. xxix. p. 287.

Sphenoptera prosternalis, p. 130, *curta*, *balassogloi*, p. 131, *striatipennis*, p. 132, *turkestanica*, *protracta*, p. 132, Turkestan, Jak., Hor. Ent. Ross. xix.

Belionota omissa, Celebes, Schauf., Hor. Ent. Ross. xix. p. 199.

Thrincopyge latifica, Texas, Horn, Tr. Am. Ent. Soc. xii. p. 146.

Chrysobothris ignicollis, N. America, *id. t. c.* p. 145.

Eucnemidæ and Throscidæ.

[*Cf.* Horn (157).]

Fauvel, —. *Throscides* et *Eucnémides* gallo-rhénans. Rev. d'Ent. iv. pp. 330-351, pl. i. fig. 2.

Consists of analytical tables of the genera and species found in the district, with catalogue of localities and synonymy. 1 new species is described, and *Hypocœlus procerulus* and *Anelastes barbarus* are figured. *Throscus pyrenæus*, Bonv. (= *heydeni*, Kr.), p. 339.

Fornax bonvouloiri, Sharp, p. 151, pl. iv. fig. 17, *F. sculpturatus*, p. 151, *parallelus*, *longicornis*, *obtusus*, Blkn., Tr. R. Dublin Soc. (2) iii. : spp. nn.

Phlegon konigi, Siberia, p. 379, sp. n., Reitt., Deutsche e. Z. xxix.

Throscus invisus, p. 201, *convergens*, *pugnax*, p. 202, *mendax*, p. 203, *sejunctus*, p. 204, *debilis*, p. 205, N. America, Horn, Tr. Am. Ent. Soc. xii.; *T. rougeti*, France, Fauvel, Rev. d'Ent. iv. p. 333 : spp. nn.

Trixagus aurociliatus, Austria, sp. n., Reitt., Wien. ent. Z. iv. p. 314 [*cf.* Fauv., Rev. d'Ent. iv. p. 334].

Elateridæ.

[*Cf.* Horn (145), Leconte (184).]

Leconte revises in a monographic manner the N. American species of *Drasterius*, p. 4, *Megapenthes*, p. 6, *Elater*, p. 8, *Agriotes*, p. 15; and records *Dolopius macer*, Lec., and *simplex*, Motsch., as merely varieties of *D. lateralis*, p. 19; Tr. Am. Ent. Soc. xii.

Horn, *t. c.*, specially notices—frequently at length—the following N. American genera and species: *Horistonotus*, species tabulated and redescribed, pp. 32-40; *Esthesopus* similarly treated, pp. 41-44; *Ludius*, pp. 45-49; *Anchastus militaris* and *bicolor*, pp. 49 & 50; *Ischiodontus*, p. 50.

Adelocera tristis, Kr. (= *funebris*, Sols.); Heyd., Deutsche e. Z. xxix. p. 281.

Chalcolepidius zonatus, Esch. Metamorphoses; Dugès, Ann. Ent. Belg. xxix. 2, pp. 32–39, pl. ii. figs. 16–35.

Isidus moreli. Habits noted; Rev. d'Ent. iv. p. 157.

Agriotes. Ravages of larvæ; Orm., Rep. viii. p. 36.

Agriotes inversus, Cand., is *Sericosomus flavipennis*, Motsch.; Horn, Tr. Am. Ent. Soc. xii. p. 16, note.

Phosphænus rougeti, Ol. This is really an insect near *Homalisus*; Oliv., Notes comp. p. 3.

New genera and species:—

Pyrapractus, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 228, very near *Pyrophorus*, for *P. sycophanta*, Madagascar, sp. n., *ibid.*

Eniconyx, near *Aphricus*, p. 51, for *E. pullatus*, Arizona, *gracilis*, N. Mexico, p. 52, spp. nn.; Horn, Tr. Am. Ent. Soc. xii.

Leptoschema, near *Limonius* and *Athous*, to include *Agriotes protractus*, Horn, *Athous bicolor*, Lec., and *discalceatum*, Say; *id. t. c.* p. 50.

Eopenthes, p. 153, for *E. basalis*, *ibid.*, *obscurus*, pl. iv. fig. 19, and *debilis*, p. 154, *satelles*, p. 155, Sharp, *konæ*, p. 154, *ambiguus*, p. 155, Blkn., spp. nn., Hawaiian Arch.; Tr. R. Dublin Soc. (2) iii.

Itodacnus, for *I. gracilis*, Oahu, sp. n.; Sharp, *t. c.* p. 156, pl. iv. fig. 18.

Melantho raffrayi, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 227, Madagascar.

Alaus debyi, Sumatra, Cand., C.R. ent. Belg. 1885, p. cxxx.

Oxynopterus harmseni, Sumatra, Candèze, Notes Leyd. Mus. vii. p. 120, pl. iv. figs. 6 & 6*a*.

Æolus ballioni, Turkestan, Heyd., Deutsche e. Z. xxix. p. 287.

Drasterius asper, *cribratus*, Texas, *debilis*, Lake Superior, Lec., Tr. Am. Ent. Soc. xii. p. 5.

Megapenthes lepidus, *nigriventris*, California, *id. t. c.* p. 7.

Elater insignis, *fastus*, p. 11, *rubriventris*, *melinus*, *ater*, *longicornis*, *subtilis*, *lateralis*, *torquatus*, p. 12, *nevadensis*, *affinis*, p. 13, N. America, *id. t. c.*

Agriotes imperfectus, p. 16, *sparsus*, *hispidus*, *nevadensis*, p. 17, *apicalis*, *torquatus*, *montanus*, p. 18, N. America, *id. t. c.*

Horistonotus vulneratus, *pullatus*, Arizona, p. 35, *basalis*, California, p. 36, *gracilis*, Nevada, p. 39, *mitis*, Utah, p. 40, Horn, *t. c.*

Esthesopus præditus, *parcus*, p. 42, *dispersus*, *pusio*, p. 43, S. United States, *id. t. c.*

Aptopus peregrinus, Texas, *id. t. c.* p. 44.

Ludius pinguis, Oregon, *id. t. c.* p. 47.

Anchastus frontalis, New Mexico, *id. t. c.* p. 49.

Cryptohypnus (*Hypolithus*) *barbatus*, Tschuktscha Penins., Sahl., Veg. exp. Vet. iv. p. 30.

Cardiophorus inclusus in copal from Benguela; Qued., B. E. Z. xxix. p. 363.

Deromecus canaliculatus, Fairm., Ann. Soc. Ent. Fr. (6) v. p. 45, Orange Bay.

Corymbites fuegensis, *id. t. c.* p. 46, Orange Bay.

Lepturoides miniata, Japan, Candèze, Notes Leyd. Mus. vii. p. 121.

Cebrionidæ and Rhipidoceridæ.

Cebriorhipis piceiventris, Cochin China, Fairm., Bull. Soc. Ent. Fr. (6) v. p. cv.; *C. basipennis*, Sumatra or Borneo, *id.* C.R. ent. Belg. 1885, p. cv.: spp. nn.

Callirhipis angustior, sp. n., Sumatra or Borneo, *id. t. c.* p. cvi.

Dascyllidæ.

Eucinetus. [See Reitter in *Silphidæ*, *ante*, p. 75.]

Euscaphurus, g. n. (*Eucinetini*), p. 328, for *E. saltator*, sp. n., California, p. 329; Casey, Bull. Cal. Ac. Sci. i.

Cyphon pallicolor, sp. n., Fairm., Ann. Soc. Ent. Fr. (6) v. p. 47, Orange Bay.

Telephoridæ.

[*Cf.* Bourgeois (37–40), Gorham (124).]

Lycides.

Lycus (*Lycostomus*) *ferrugineus*, Fab., and *L. similis*, Hope, commented on and considered two valid species, and a new variety of the former described from Celebes and the Moluccas; Bourg., Ann. Soc. Ent. Fr. (6) v. p. 72. *L.* (*Lycostomus*) *suturalis*, Redt.: *L. patruelis*, Bourg., is only a variety of this; *id. t. c.* p. 73. *L.* (*Lycostomus*) *nigripes*: variation and habitat described; *id. t. c.* p. 75. *L. thoracicus*: variation; *id. t. c.* p. 77.

Lycostomus modestus, Waterh., *nec* Kies., to be called *L. honestus*; *id. t. c.* p. 73.

Lycus ambiguus, Waterh. The supposed sexes are 2 species; the name *ambiguus* to be preserved for the insect considered by Waterhouse to be the male; the suppositious female is named and described as *Lycus* (*Lycostomus*) *restitutus*, Northern India: *id. t. c.* p. 75.

Lygistopterus flabellatus, Motsch. (= *Cerceros pectinicornis*, Kr., = *Celetes pectinifer*, Gorh.). This synonymy maintained notwithstanding Gorham's doubts; *id. t. c.* p. 71.

Thonalmus. Calopteron denominatum, dominicatum, nigritarse (Chevr., Ann. Soc. Ent. Fr. 1870), belong to this genus; *id.* Bull. Soc. Ent. Fr. (6) v. p. cxlviii.

"*Coenia dohrnii, coquerelii, klugii, angulata, torquata, baillyi*, me semblent rentrer dans le genre *Cautires*, Wat."; Fairm., Ann. Soc. Ent. Fr. (6) iv. p. 229.

Lipernes perspectus, Waterh. ♂ described; Bourg., Ann. Soc. Ent. Fr. (6) v. p. 71.

Conderis velutinus, Waterh., is not the same as *signicollis*, Kirsch; *id. t. c.* p. 81.

New genus and species:—

Coloberos, g. n., p. 82, between *Taphes* and *Pyropterus*, for *C. tenellus*, sp. n., p. 83, Darjeeling; Bourg., Ann. Soc. Ent. Fr. (6) v.

Lycus (*Lycostomus*) *elongatulus*, Burmah, p. 73, *L.* (*Thoracocalon*) *umbraticeps*, New-Grenada, p. 77, *id. t. c.*

Calopteron opulentum, p. 77, Ecuador, *pretiosum*, p. 78, New Grenada, *id. t. c.*; *C. biplectile*, Argentine Rep., Berg, An. Soc. Arg. xix. p. 228.

Lygistopterus missionum, Argentine Rep., *id. t. c.* p. 226.

Plateros correntinus, Corrientes, *id. t. c.* p. 229.

Lyponia himalegica, Darjeeling, Bourg., Ann. Soc. Ent. Fr. (6) v. p. 79.

Xylobanus alveolus and *approximans*, Darjeeling, *id. t. c.* p. 80 (*X. fastidiosus* recorded from Himalaya, *id.*).

Conderis waterhousei, Darjeeling, *id. t. c.* p. 81.

Trichalus olivieri, p. 83, and *pygoxanthus*, p. 84, Moluccas, *id. t. c.*

Cautires holomelas, Fairm., Ann. Soc. Ent. Fr. (6) iv. p. 229, Madagascar.

Lycaina discoidalis, Texas, Horn, Tr. Am. Ent. Soc. xii. p. 150.

Lampyrides.

[*Cf.* Olivier (230–232).]

Calopteron albicolle, Chev., probably belongs to this group; Bourg., Bull. Soc. Ent. Fr. (6) v. p. cxlviii.

Phosphænus rougeti, Ol. This does not belong to *Phosphænus* nor to the *Lampyrides*, but is perhaps the ♀ sex of a species near *Homalisus suturalis*; Oliv., Notes comp. p. 3.

Lamprocera latreillei, *flavo-fasciata*, *tristior*. Notes on; *id.* Ann. Soc. Ent. Fr. (6) v. pp. 126 & 127.

Lampyris lucida, L., is not a *Lamprocera*, as given in Mun. Cat., but a *Photinus*; *id. t. c.* p. 128.

Lucio, Cast., reinstated, and definition given of *Lamprocera*; *id. t. c.* p. 125. *L. abdominalis*, *brunnea*, *picta*, *blattina*: comments on; *id. t. c.* pp. 128–131.

Hyas differentiated; *id. t. c.* p. 132 *Lamprocera flavo-quadrata*, Blanch., belongs to it; *id. t. c.* p. 133. *H. denticornis*, *flabellata*: notes on; *id. t. c.* p. 135.

Cratomorphus subcostatus. ♀ described; *id.* Ann. Ent. Belg. xxix. 2, p. 24.

Tenaspis. Characters of; *id.* Ann. Soc. Ent. Fr. (6) v. p. 135. *Hyas semifusca* belongs to it; p. 136.

Cladodes. Noted on, with table of known species; *id. t. c.* pp. 136–138. *C. ater*, *lamellicornis*, *demoulini*, *flabellicornis*, *ventralis* noticed; *id. t. c.*

Phænolis noticed; *id. t. c.* p. 142.

Calyptocephalus noticed; *id. t. c.* p. 143.

Megalophthalmus. Characters of; *id. t. c.* p. 144.

Megalophthalmus collaris, *costatus* (= *obsoletus*, Blanch.), *marginatus* noticed; *id. t. c.* *M. melanurus*, Cast., is an *Æthra*; *id. t. c.* p. 147.

Psilocladus, Blanch. (= *Drilolampadius*, Gorh.). Characters of genus and table of species; *id. t. c.* pp. 147–149. *P. miltoderus* (type): note on; p. 151.

Luciola italica, light of [*cf.* Emery (97)]. *L. madagascariensis*, Guer.,

and *goudotii*, Cast., redescribed; Fairm., Ann. Soc. Ent. Fr. (6) iv. pp. 229 & 230.

Lampyris depressiuscula, Motsch.: ♀ described at length; Bourg., Bull. Soc. Ent. Fr. (6) v. pl. lxiii. *L. attenuata*, Fairm.: amended description of ♀; Oliv., Bull. Soc. Ent. Fr. (6) v. p. ix. *L. cribricollis*, Klug, Ins. Mad, probably near *Luciola maculiscutum*; Fairm., Ann. Soc. Ent. Fr. (6) iv. p. 231.

Nyctophila molesta, J. du V. Note on; Oliv., Notes comp. p. 1.

Gorham, Biol. Centr. Am. *Col.* iii. (2), specially notices or figures the following known forms:—*Photuris hectica* (sub *Lampyris*) Fab., p. 273, *frontalis*, Lec., p. 274, *amœna* var. ? *nitida*, *lucidicollis* var. n. *sordida*, pl. xii. fig. 11, Panama, *simplex*, of which *scapularis*, Gorh., *ante*, p. 62, is now considered a var., p. 276.

The following species and genera are specially noticed (some of them being redescribed) by Olivier, Ann. Mus. Genov. (2) ii.:—*Vesta*, its limits &c.; *V. menetriesi*, *V. proxima*, *V. urens*, pp. 334-336; *Lucidota banoni*, p. 336, *atra*, p. 337; *Photinus coruscus*, *lunicollis*, p. 337, *sturmii*, *impressicollis*, Motsch., *pyralis*, L. (= *consanguineus*, Gorh.), p. 338, *ardens*, *longipennis*, *vittiger*, *blandus*, p. 339; *Cratomorphus insignis*, *bifenestratus*, p. 341; *Aspidosoma maculatum*, *ignitum*, *hesperum*, p. 342; *ælianum*, *bilineatum*, *Lamprophorus nepalensis*, p. 343, *boyei*, p. 344; *Diaphanes* (= *Lychnebius*, Motsch.), p. 345; *Pyrocælia*, *P. terminata*, *bicolor*, p. 348; *Lampyris attenuata*, p. 349, *lareynei*, p. 351; *Nyctophila* proposed as valid genus, p. 352, *N. molesta*, p. 353; *Lampyroidea*, *L. maculithorax*, *curtos*, *mongolicus*, p. 355; *Luciola*, *L. pallescens*, p. 356, *testacea*, p. 357, *carinata*, p. 358, *chinensis*, p. 359, *picticollis*, *discicollis*, Cast. (= *discoidea*, Gorh.), *coxalis*, p. 361, *lusitanica*, *australis*, p. 362, *zanzibarica*, p. 363, *circumdata*, p. 364; *Colophotia*, Motsch., p. 367, *C. præusta*, p. 368; *Photuris collaris*, *lividipennis*, *lucidicollis*, p. 371, *tristissima*, p. 372.

New genera and species:—

Phænopyrus, near *Diaphanes*, for *P. birmanensis*, pl. v. fig. 1, sp. n., Oliv., Ann. Mus. Genov. (2) ii. p. 347.

Pyrophanes, p. 368, to include *Luciola indica*, Motsch., and *P. beccarii*, Aru I., *appendiculata*, New Guinea, p. 369, *similis*, pl. v. fig. 12, p. 370, Celebes, spp. nn., *id. t. c.*

Spathizus, between *Cenophengus* and *Tytthonyx*, p. 20, for *S. bicolor*, Arizona, p. 21, sp. n., Lec., Tr. Am. Ent. Soc. xii.

Lamprocera diluta, Cayenne, Oliv., Ann. Soc. Ent. Fr. (6) v. p. 127.

Lucio ruficentris, hab. ?, *splendens*, Paraguay, Brazil, p. 129, pl. iii. fig. 1, *melanura*, p. 130, *dimidiata*, p. 131, Amazons, *obscura*, New Grenada, p. 132, *id. t. c.*

Hyas quadrimaculata, Brazil, *luctuosa*, fig. 2, *afflicta*, p. 133, Ecuador, *fallax*, Colombia, *fasciata*, Amazons, p. 134, *id. t. c.*

Cladodes humeralis, fig. 3, *delandei*, p. 139, *bourgeoisi*, fig. 4, (*Ledocas*) *parallelus*, fig. 5, p. 140, (*Dodacles*) *attenuatus*, (*D.*) *elegans*, fig. 7, p. 141, Brazil, *id. t. c.*; *P. attenuatus*, Montevideo, *id.* Ann. Mus. Genov. (2) ii. p. 333.

Vesta rotundata, Sumatra, *id. t. c.* p. 335.

Pleatomus nigripennis, Arizona, Lec., Tr. Am. Ent. Soc. xii. p. 20.

Scalyptocephalus gratiosus, fig. 8, p. 143, *mimicus*, p. 144, Amazon, Ol., Ann. Soc. Ent. Fr. (6) v.

Phænolis gorhami, *sternalis*, Amazon, *id. t. c.* p. 142.

Lucidota approximans, p. 22, *perpusilla*, *parvicollis*, p. 23, Brazil, *id.* Ann. Ent. Belg. xxix. (2).

Photinus omissus, Argentine Rep., *id.* Ann. Mus. Genov. (2) ii. p. 340; *P. lineatus*, Rio de Janeiro, *id.* Ann. Ent. Belg. xxix. (2) p. 23.

Pyropyga simplex, Arizona, Lec., Tr. Am. Ent. Soc. xii. p. 20.

Aspidosoma lætum, Argentine Rep., p. 230, *argutum*, Corrientes, p. 231, Berg, An. Soc. Arg. xix.; *A. fusiforme*, Buenos Ayres, p. 24, *rotundata*, Brazil, p. 25, Oliv., Ann. Ent. Belg. xxix. (2) p. 25.

Lamprophorus nitens, Borneo, p. 344, *minor*, Burmah, p. 345, *id.* Ann. Mus. Genov. (2) ii.

Lampyris longicollis, Abyssinia, *id. t. c.* p. 351, pl. v. fig. 3.

Diaphanes humeralis, Sumatra, p. 346, Oliv., Ann. Mus. Genov. (2) ii.

Pyrocœlia opaca, Borneo, *id. t. c.* p. 349, pl. v. fig. 2.

Lamprohiza riversi, California, Lec., Tr. Am. Ent. Soc. xii. p. 20.

Luciola hamulata, Borneo, p. 357, *doriæ*, p. 358, and *cingulata*, pl. v. fig. 5, Ceylon, p. 359, *tarsalis*, pl. v. fig. 6, p. 360, *anthracina*, p. 363, *microthorax*, pl. v. fig. 7, p. 364, and *antennata*, fig. 8, New Guinea, *tenuicornis*, Celebes, fig. 9, p. 365, *gestroi*, Cape York, fig. 10, p. 366, Oliv., Ann. Mus. Genov. (2) ii.; *L. maculiscutum*, p. 231, *fulvago*, *vitticollis*, p. 232, *transversicollis*, *costipennis*, p. 233, Madagascar, Fairmaire, Ann. Soc. Ent. Fr. (6) iv.

Colophotia dives, Manilla, Oliv., Ann. Mus. Genov. (2) ii. p. 367.

Photuris livida, p. 273, Panama, *crassa*, p. 274, pl. xii. figs. 12 & 13, with varr., Mexico, Panama, Gorh., Biol. Centr. Am. *Col.* iii. (2); *P. coxalis*, Brazil, Oliv., Ann. Ent. Belg. xxix. (2) p. 25.

Rhagophthalmus sumatrensis, Mt. Singalang, *id.* Ann. Mus. Genov. (2) ii. p. 372.

Megalophthalmus obscurus, Brazil, *decorus*, p. 146, *spiloceras*, p. 147, Amazon, *id.* Ann. Soc. Ent. Fr. (6) v.

Psilocladus melas, p. 149, *formosus*, Amazon, *suturalis*, Colombia, fig. 9, p. 150, *inauditus*, Cayenne, *pulcher*, Brazil, p. 151, *nebulosus*, fig. 10, Colombia, p. 152, *lineolatus*, Brazil, *guerini*, fig. 11, Colombia, p. 153, *id. t. c.*

Zarhipis riversi, California, Horn, Tr. Am. Ent. Soc. xii. p. 148.

Telephorides.

Phengodes. The supposed larva "Astraptor" is really the female of *Phengodes*; SB. Ges. Isis. 1885, p. 10.

fulvicollis, Gorham, Biol. Centr. Am. *Col.* iii. 2, specially notices or figures the name for any known *Telephorides*:—*Phengodes bimaculata*, p. 276; *Daiphron testaceum*, *ochraceum*, *proteum*, p. 277; *Chauliognathus heros*, Guer., p. 277, *tripartitus*, *distinguendus*, *togatus*, *profundus*, Lec., p. 278, *bilineatus* var., pl. xii. fig. 16, *exsanguis*, p. 279, *scutellaris*, *limbicollis*, p. 283; *Discodon erosum*, *carbonarium*, p. 285, *marginatum*, *vitticolle*, p. 286, *flavicolle*, *normale*,

perplexum, *cleroides*, p. 287, *difficile*, p. 288; *Telephorus lampyroides*, Gorh., *ante*, p. 89, belongs to *Discodon*, p. 288; *Silis lycoides*, p. 290, *varians* var., pp. 291 & 292, *hæmatodes*, p. 294, *eroides*, *lineata*, p. —. *Belotus abdominalis*, p. 308, *maculatus*, p. 309; *Maronius dichrous* var., p. 309, pl. xii. fig. 17; *Thinalmus centrolineatus*, *Malthinus terminalis*, p. 309, *cruenticeps*, *flavipes*, *Malthodes pallipes*, p. 310; *Euryopa fusca*, *singularis*, p. 312.

Larvæ and pupæ of *Cantharis alpina*, Payk., *abdominalis*, Fabr., *violacea*, Payk., *fusca*, L., *rustica*, Fall., *nigricans*, Müll., *pellucida*, Fabr., *livida*, L., *rufa*, L., *discoidea*, Ahr., *fulca*, Scop., described at greater or less length; Beling, B. E. Z. xxix. pp. 352–361.

Pyractomena (*Chauliognathus*) *bioculata*, Blanchd. Suggestion that *Lampyris obscura*, Fab., Syst. Ent. p. 200, may be this species; Fairm., Ann. Soc. Ent. Fr. (6) v. p. 47.

Malthodes pellucidus. Larva and pupa described; Beling, B. E. Z. xxix. p. 362.

New genera and species :—

Cylistus, representing in the Mediterranean fauna the American *Phengodes*, and to be placed at the head of the *Cantharini*; Bourg., Bull. Soc. Ent. Fr. (6) p. xxxvii., for *C. reitteri*, sp. n., Caiffa, p. xxxviii. : re-described and figured, Ann. Soc. Ent. Fr. (6) v. p. 273, pl. v. fig 5.

Haplous, near *Telephorus*, for *H. segmentarius*, sp. n., Orange Bay; Fairm., Ann. Soc. Ent. Fr. (6) v. p. 47. (Suggestion that *Telephorus magellanicus*, Le Guill., should be assigned to this genus, *id.* p. 48.)

Parasilis, p. 307, for *P. colyphoides* and *vittata*, spp. nn., p. 308, Panama; Gorh., Biol. Centr. Am. *Col.* iii. (2).

Malthaster, near *Malthinus*, p. 311, for *M. suturalis*, sp. n.; *id. t. c.*

Caccodes, near *Malthodes*, for *C. debilis*, sp. n.; Sharp, Tr. R. Dublin Soc. (2) iii. p. 157.

Phengodes pallens, Buenos Aires, Berg, An. Soc. Arg. xix. p. 232.

Cantharis (*Telephorus*) *forticornis*, p. 287, *pumilio*, p. 288, Turkestan, Heyd., Deutsche e. Z. xxix.

Telephorus (*Cantharis*) *cordubensis*, Cordoba, p. 233, *postangularis*, Buenos Aires, p. 234, Berg., *t. c.*; *T. costipennis*, Florida, Lec., Tr. Am. Ent. Soc. xii. p. 21; *T.* (*Silis*) *cephalotes*, Panama, *T.* (*Chauliognathus* ?) *hæreticus*, Nicaragua and Panama, p. 289, Gorh., Biol. Centr. Am. *Col.* iii. (2).

Chauliognathus ineptus, *misellus*, Arizona, Horn, Tr. Am. Ent. Soc. xii. p. 150; *C. faustus*, p. 278, pl. xii. fig. 14, Costa Rica, Panama, *submarginatus*, p. 279, Nicaragua, Panama, *sticticus*, *sagittarius*, *pardalinus*, Panama, p. 280, *corvinus*, Guatemala to Panama, *obliquus*, fig. 15, p. 281, *forreri*, *hieroglyphicus*, *subulipennis*, p. 282, Mexico, *exiguus*, p. 283, Panama, spp. nn., Gorh., *t. c.*

Podabrus mexicanus, Mexico, p. 284, *id. t. c.*; *P.* (*Dichelotarsus*) *salvador*, *lusus*, p. 31, *Rhagonycha latiuscula*, p. 32, Tschuktscha penins., San., Veg. exp. Vet. iv.

Discodon calidum, Panama, p. 285, *tenue*, *cinereum*, Guatemala, p. 286, *serricorne*, p. 288, Gorh., Biol. Centr. Am. *Col.* iii. (2).

Polemius princeps and *strenuus*, Arizona, *marginicollis*, New Mexico, Lec., Tr. Am. Ent. Soc. xii. p. 21.

Silis nodicollis, Guatemala, Panama, *plateroides*, p. 291, *diversa*, Panama, *serrigera* (= *varians* var. on pl. vi. fig. 1), p. 292, Guatemala, Panama, *combusta*, *ocularis*, p. 293, *sepulchralis*, *melanocephala*, p. 294, Guatemala, *aurita*, Costa Rica, *transfixa*, *fulvipes*, p. 295, Panama, *lineola*, p. 296, Mexico to Panama, *oblita*, p. 297, *ardua*, Panama, *sicula*, *proxima*, p. 298, Guatemala, *paupercula*, Guatemala, Panama, *amicula*, p. 299, *nigroplectum*, *chalybeipennis*, pl. xii. fig. 18, p. 300, *jocosa*, *torticollis*, *festiva*, p. 301, Panama, *ludicra*, p. 302, *longicornis*, *sallei*, *coarctata*, p. 303, *analis*, Mexico, *appendicularis*, Panama, *pauxilla*, p. 304, Guatemala, Panama, *minuscula*, *minuta*, p. 305, Guatemala, *hilara*, Mexico, p. 306, Gorh., Biol. Centr. Am. *Col.* iii. (2); *S. atra*, N. America, Lec., Tr. Am. Ent. Soc. xii. p. 22; *S. bihamaticollis*, *spurcaticornis*, (*S.* ?) *apicicornis*, Borneo or Sumatra, Fairm., C.R. ent. Belg. 1885, p. cvi.

Plectonotum labiale, Panama, p. 307, Gorh., Biol. Centr. Am. *Col.* iii. (2).

Malthinus dromioides, Greece, Bourg., Bull. Soc. Ent. Fr. (6) v. p. cxxvi.

Malthodes bivulor, Arizona. Lec., Tr. Am. Ent. Soc. xii. p. 22; *M. tetra*, p. 310, Panama, Gorh., Biol. Centr. Am. *Col.* iii. (2).

Drilides.

Selasia pallida, Delagoa Bay, Pering., Tr. S. Af. Soc. iii. p. 102, sp. n.

Melyrides.

Abeille de Perrin, Catalogus *Malachiidarum*, Europæ et Circa; Deutsche e. Z. xxix. pp. 257–263: *id.* (2).

Malachius faldermanni, Ksw., Fald. Synonymy discussed; Reitter, Wien. ent. Z. iv. p. 229.

Malachius. For notes on various Mediterranean species of, *vide* Ab., Rev. d'Ent. iv. pp. 18 & 19.

Cyrtosus cyprius, Baudi, is a *Malachius*; *C. corniculatus* and *albifrons* noticed: Ab., Rev. d'Ent. iv. p. 20.

Abeille de Perrin, Rev. d'Ent. iv. p. 153, records the following synonymy from examination of types: *Cyrtosus ovalis* var. (= *armifrons*, Kr.), *nitidicollis* (= *celatus*, Peyr.); *Malachius angustatus* (= *furcatus*, Peyr., = *macer*, Ksw.), *debilis*, Ksw. (= *opacus*, Ksw.); *Attalus maculicollis* (= *ecaudatus*, Peyr.), *limbatus* (= *ulicis*, Er.), *lusitanicus* (= *miniaticollis*, Tourn.), *siculus* (= *viridifrons*, Schf.); *Ebæus tricolor* (= *decorus*, Ab.); *Charopus rotundatus* (= *multicaudis*, Ksw.), *rotundatus* var. (= *marginatus*, Ksw.); *Antidipnis cinctus* (= *palpator*, Mars.); *Apalochrus fulvicollis* (= *flavicollis*, Schf.). *Attalus dasytiformis* is proposed as a new name for *A. dasytoides*, Ab.; and *Anthocomus sellatus*, Solsk., is rehabilitated as a valid species.

Troglops marginatus, Waltl, and allies. Synonymy; Ab., *t. c.* p. 17.

Cyrtosus, *Anthocomus*, and *Troglops* discussed; species of the latter tabulated: *id. t. c.* pp. 23–27.

Attalus (sub *Malachius*) *limbatus*, Fab. (= *A. ulicis*, Er.), and *A. maculicollis*, Luc. (= *ecaudatus* sub *Axinotarsus*, Peyr.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 86.

Uebersicht der bekannten *Dasytiscus*-Arten, by Reitter; an analytical table for the discrimination of the species; Ent. Nachr. xi. pp. 241–247. *D. graminicola*, Kies. (= *affinis*, Moraw.), p. 246.

New species:—

Collops abrinoides, Kaldjo, Abeille, Bull. Soc. Ent. Fr. (6) v. p. cxvi.

Cyrtosus dolorosus, Batna, p. 4, *rufifrons*, Syria, *meridionalis*, Europe, Algeria, p. 140, *afer*, Algeria, p. 142, *strangulatus*, Orenburg, p. 143, *id.* Rev. d'Ent. iv.

Malachius quadricollis, Askold I., p. 5, *mariæ*, Turkey, p. 6, *fausti*, Persia, *judex*, Baku, p. 7, *allochromus*, Ourmiah, p. 8, *id. t. c.*

Axinotarsus nigritarsis, Spain, *id. t. c.* p. 10.

Anthocomus azureus, Siberia, *id. t. c.* p. 143.

Attalus peucedani, n. n. for *A. pulchellus*, Muls., Rey., *nec* Kl., *id.* Rev. d'Ent. iv. p. 10; *A. leptocephalus*, *bonnairei*, p. 144, *punctifer*, Algeria, (*Pelochrus*) *brevicollis*, Caucasus, p. 145, spp. nn., *id. ibid.*

Charopus philoctetes, Caucasus, *id. t. c.* p. 13.

Ebæus nigrocaudatus, Italy ?, *modestus*, Dahuria, p. 11, *decorus*, Persia, p. 12, *epipleuralis*, Siberia, *turkestanicus*, p. 146, *hystrix*, p. 147, *oculifer*, *personatus*, p. 149, Turkestan, *mirandus*, p. 148, Siberia, *id. t. c.*

Hypebæus virgineus, p. 13, *cedrorum*, p. 150, Algeria, *id. t. c.*

Troglops diminutus, Europe, p. 14, *bourgeoisi*, *pyriventris*, Algeria, p. 15, *punctatulus*, Spain (= *nigripes*, Peyr.), p. 16, *furcatus*, *bisignatus*, Algeria, p. 151, (*Psiloderes*) *diabolicus*, Egypt, p. 152, *T.? planicollis*, Turkestan, p. 152, *id. t. c.*

Julistus griseo-hirtus, Crete, Reitt., Deutsche e. Z. xxix. p. 380.

Dasytiscus transcaspicus, p. 256, pl. v. fig. 1, Turkestan, *abeillei*, Palestine, p. 261, *puberulus*, Lebanon, p. 262, *syrticus*, Tunis, p. 266, *laticollis*, Mesopotamia, p. 267, *sedilloti*, p. 268, pl. fig. 4, Tunis, *rufimanus*, Turkestan, p. 269, *melitensis*, Malta, p. 270, Bourg., Ann. Soc. Ent. Fr. (6) v.; *D. hybridus*, Lebanon, *fulvipes*, Syria, *nigropilosus*, Spain, p. 244, *danacæoides*, Greece, *syriacus*, Syria, *subtilis*, Crete, *impressicollis*, Morea, p. 245, *æqualis*, Greece, *rotundicollis*, Syria, p. 246, *hirtulus*, Baku, p. 247, Reitter, Ent. Nachr. xi.

Helcogaster pectinatus, Honolulu, Sharp, Tr. R. Dublin Soc. (2) iii. p. 157, pl. iv. fig. 20.

Melyris limbata, S. Africa, Pering., Tr. S. Af. Soc. iii. p. 103.

Cleridæ.

Colyphus signaticollis and *cinctipennis* are no doubt Mexican and not North American; *C. rufipennis* and *interceptus* also are probably Mexican: Horn, Tr. Am. Ent. Soc. xii. p. 151.

Clerus sanguinosus, Chev. Note on variation, &c; Ent. Nachr. xi. pp. 76 & 185.

New genera and species :—

Diplocladus, near *Cladiscus*, for *D. oculicollis*, sp. n., E. Africa ; Fairm., C.R. ent. Belg. 1885, p. viii.

Aphelochroa, near *Opilus*, p. 267, for *A. carnèipennis*, sp. n., p. 268, W. Trop. Africa ; Qued., B. E. Z. xxix.

Cardiostichus, near *Placocerus*, p. 268, for *C. mechowi*, sp. n., p. 269, pl. ix.B, W. Trop. Africa ; *id. t. c.*

Opilus cyaneo-purpureus, E. Africa, Fairm., C.R. ent. Belg. 1885, p. viii.

Clerus (*Cleronomus*?) *fulvus*, W. Trop. Africa, Qued., B. E. Z. xxix. p. 270 ; *C. ocreatus*, Kansas, Horn, Tr. Am. Ent. Soc. xii. p. 54.

Hydnocera longa, Arizona, Lec., Tr. Am. Ent. Soc. xii. p. 22.

Cymatodera turbata, p. 151, *sirpata*, p. 152, *fallax*, p. 153, N. America, Horn, Tr. Am. Ent. Soc. xii.

Stigmatium granigerum, W. Trop. Africa, Qued., B. E. Z. xxix. p. 271.

Lymexylonidæ and Cupesidæ.

Atractocerus fissicollis, sp. n., Borneo or Sumatra, Fairm., C.R. ent. Belg. 1885, p. cviii.

Cupes raffrayi, sp. n., *id.* Ann. Soc. Ent. Fr. (5) iv. p. 234, Madagascar.

Ptinidæ.

Ptinides.

Gibbium psylloides and allies : synonymy of ; Reitt., Wien. ent. Z iv. p. 59. *G. scotias* : biological note; Bull. Soc. Metz (2) vi. p. 5.

Niptus hololeucus. Development in peculiar conditions ; JB. westf. Ver. xiii. p. 32.

Anobiides.

Buddeberg, JB. nass. Ver. xxxviii., contributes observations to the life-histories of *Hedobia imperialis*, L., p. 81, *Xestobium plumbeum*, Ill., p. 83, *Anobium fagicola*, Muls., p. 84.

Xyletobius insignis, p. 158, *serricornis*, p. 159, Blkn., *affinis*, p. 158, *lineatus*, p. 159, Sharp, Hawaiian Arch., spp. nn., Tr. R. Dublin Soc. (2) iii. ; *X. marmoratus* figured, *t. c.* pl. iv. fig. 23.

Holcobius major figured, *t. c.* pl. iv. fig. 24.

Catorama pusilla, sp. n., Maui, Sharp, *t. c.* p. 160.

Mirosternus acutus, sp. n., Maui, Blkn., *t. c.* p. 160.

Cenocara occidens, sp. n., California, Casey, Bull. Cal. Ac. Sci. i. p. 330.

Theca italica, Italy, p. 380, *dorcatomoides*, Syria, p. 381, Reitt., Deutsche Z. xxix. ; *T. striatopunctata*, California, Lec., Tr. Am. Ent. Soc. xii. p. 22?, spp. nn.

Bostrichidæ.

Bostrichus (= *Amphicerus*, Lec., that author's *Bostrichus* being different from the European) ; Sharp, Tr. R. Dublin Soc. (2) iii. p. 161. *B. migrator*, sp. n., *id. t. c.* p. 160.

Silvanus retrahens, Walk., is a species of *Lyctus*; Oll., P. Linn. Soc. N. S. W. x. p. 71.

Ditoma rugicollis, Walk., is a *Lyctus*; Sharp, J. L. S. xix. p. 117.

Apoleon, g. n., near *Polycaon*, p. 51, for *A. edax*, sp. n., Laos and Borneo, p. 52; Gorham, Notes Leyd. Mus. vii.

Sinoxylon simplex, floridanum, spp. nn., N. America, Horn, Tr. Am. Ent. Soc. xii. p. 155.

Cioidæ.

Analytical table of genera of this family; Reitt., Deutsche e. Z. xxix. p. 210.

Cisarthron, g. n., near *Ennearthron*, p. 208, for *C. lævicolle*, sp. n., Bosnia; *id. t. c.*

Diphyllocis, g. n., near the preceding, for *Ennearthron opaculum*, Reitt.; *id. t. c.* p. 209.

Cisdygma, g. n., for *C. clavicornis*, Baudi; *id. t. c.* p. 209.

Cis bimaculatus, p. 161, *longipennis*, *apicalis*, *setarius*, p. 162, *concolor*, p. 163, *chloroticus*, *calidus*, *insularis*, p. 164, *roridus*, *attenuatus*, *ephistemoides*, p. 165, pl. iv. fig. 21, Sharp, *nigrofasciatus*, p. 162, *vagepunctatus*, p. 166, Blkn., Hawaiian Arch., spp. nn., Tr. R. Dublin Soc. (2) iii.; *C. setarius* and *apicalis* may be one species, Blkn., *t. c.* p. 163; *C. bicolor* figured, *id. t. c.* pl. iv. fig. 22; *C. juglandis*, sp. n., Bosnia, Reitt., Deutsche e. Z. xxix. p. 208.

Tenebrionidæ.

[*Cf.* Quedenfeldt (261).]

Adesmiides and *Megagenides*.

[*Cf.* Allard (4).]

New species:—

Macropoda maculicollis, Quango, Qued., B. E. Z. xxix. p. 2.

Adesmia andersoni, p. 103, *sulcipyga*, *palgravei*, p. 105, *fossulata*, p. 106, *epiphysoides*, *stenocaroides*, p. 106, Damara-land, *namaquensis*, p. 104, Namaqualand, Pering., Tr. S. Af. Soc. iii.; *A. duponchelii*, Algeria, *æthiopia*, Abyssinia, *indica*, N. India, All., Le Nat. vii. p. 39; *A. æthiopia*, Abyssinia, p. 182, All., Ann. Soc. Ent. Fr. (6) v.

Physosterna lævis, N'Gami, *punctiger*, Angola, All., Le Nat. vii. p. 39, and Ann. Soc. Ent. Fr. (6) v. pp. 169 & 170.

Stenocara sericeiceps, p. 108, *damarensis*, p. 109, Damara-land, Pering., Tr. S. Af. Soc. iii.

Oteroscelis de vecchi, Persia, Syria, p. 189, *fossulata*, Arabia, p. 191, *indica*, N. India, p. 192, All., Ann. Soc. Ent. Fr. (6) v.

Tentyriides.

Conœcus, g. n., for *C. ovipennis*, sp. n., Texas; Horn, Tr. Am. Ent. Soc. xii. p. 159, pl. v. fig. 12.

Epitragides.

Himatismus nigrosulcatus, sp. n., W. Africa, Qued., B. E. Z. xxix. p. 3.

Zopherides.

Zopherus granicollis, sp. n., Lower California, Horn, Tr. Am. Ent. Soc. xii. p. 160.

Adelostomides.

Adelostoma bedeli, sp. n., Algeria, Reitt., Wien. ent. Z. iv. p. 317.

Stenosides.

Tagenia alternicostis, sp. n., Abyssinia, Mars., Nouv. et faits, No. 36, p. cxlvii.

Scaurides.

Champion, Biol. Centr. Am. *Col.* iv. (1), notices or figures the following known forms of this group:—*Argoporis bicolor*, pl. v. fig. 1, *Ammophorus denticollis*, p. 96.

Argoporis rufipes, pl. v. fig. 2, *crassicornis*, fig. 3, *brevicollis*, p. 94, *quadripes* (Horn), fig. 4, *cavifrons*, fig. 5, p. 95, Mexico, spp. nn., Champion, *t. c.*

Blaptides.

Champion, Biol. Centr. Am. *Col.* iv. pt. 1, pp. 89–93, notices or figures the following forms:—*Elæodes solieri*, pl. iv. fig. 20, *impolita*, fig. 22, *gravida*, *angulata*, *sulcata* (sub *Xysta*), Esch., fig. 24, and proposes *brevicollis*, n. n., for the *Elæodes obsoleta*, Sol., nom. præoc.

Blaps propheta, Reiche (= *B. pubescens*, Allard). The insect that Allard, *op. cit.* 1881, p. 165, considered to be *B. propheta*, was not that species; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 87.

Prosodes ballionis, n. n. for *P. lucida*, Kr. (*nec* Ball.), Turkestan; Kr., Deutsche e. Z. xxix. p. 288.

New species:—

Elæodes sallæi, p. 89, pl. iv. fig. 21, *coarctata*, *högei*, fig. 23, p. 91, *stolida*, p. 92, Mexico, Champion, *t. c.*

Prosodes consanguineus, Astrabad, All., Wien. ent. Z. iv. p. 180; *P. alaiensis*, p. 288, *nitida*, p. 289, *rugosicollis*, p. 290, Turkestan, Kr., Deutsche e. Z. xxix.

Blaps mæander, p. 291, *B.* (*Dineria*) *gracilicollis*, p. 292, Turkestan, *id. t. c.*

Uroblaps reitteri, Turcomania, All., Wien. ent. Z. iv. p. 180.

Nycteliides.

Callyntra paulsenii, Chili, sp. n., Fairm., Bull. Soc. Ent. Fr. (6) v. p. clvi.

Pimeliides.

Pimelia oblonga, Mogador, p. lxxi., *brisonti*, Algeria, p. lxxii., spp. nn., Sénac, Bull. Soc. Ent. Fr. (6) v.

Lasiostola hirtipes, Turkestan, sp. n., Kr., Deutsche e. Z. xxix. p. 293.

Molurides.

New species :—

Melanolophus ater, Kilima-njaro, Waterh., P. Z. S. 1885, p. 235, pl. xv. fig. 6.

Phrynocolus placidus, Gondokoro, Kolbe, B. E. Z. xxix. p. 112.

Psammodes sulcicollis, Zambezi River, Pering., Tr. S. Af. Soc. iii. p. 110; *P. expletus*, p. 4, *propinquus*, p. 5, W. Africa, Qued., B. E. Z. xxix.

Distretus mechowi, Quango, *id. t. c.* p. 6, pl. iii. fig. 1.

Sepidium angolense, Angola, *id. t. c.* p. 7, pl. iii. fig. 2.

Trachynotus scrobiculatus, p. 110, *impressicollis*, p. 111, *serratus*, *pilosus*, p. 112, *lutosus*, p. 113, Cape Colony, *terrenus*, Orange Riv., *dubius*, Damaraland ?, p. 114, Pering., Tr. S. Af. Soc. iii.

Clinocranion latemarginatum, Transvaal, p. 116, *alstoni*, Cape Colony, p. 117, *id. t. c.*

Pedinides.

Champion, Biol. Centr. Am. *Col.* iv. (1), figures, pl. vi. fig. 16, *Blapstinus interstitialis*, adopting this name for *Opatrinus punctulatus*, Duv. (*nec* Sol.).

Colpotus pectoralis, Muls., var. (= *Pandarinus ruficornis*, Reitt.); Reitt., Wien. ent. Z. iv. p. 82.

Isocerus ferrugineus and *purpurascens*, Herbst, are probably the sexes of one species; Kr., Deutsche e. Z. xxix. p. 16.

New genus and species :—

Penichrus (Dej. Cat.), Champion, *t. c.* p. 134, for *P. blapstinoides*, sp. n., Panama, p. 135, pl. vi. fig. 23.

Blapstinus mexicanus, Mexico, p. 124, *tibialis*, pl. vi. fig. 9, Guatemala, Nicaragua, *grandis*, fig. 18, Nicaragua, p. 125, *longicollis*, Guatemala, Nicaragua, p. 126, *errabundus*, Mexico to Panama, *insularis*, Panama, *umbrosus*, p. 127, *palmeri*, *substriatus*, Mexico, *buqueti*, fig. 17, Panama to S. America, p. 128, *egenus*, Guatemala to S. America, *sulcipennis*, fig. 21, Guatemala, *intermedius*, Mexico to Nicaragua, p. 129, *nitidus*, fig. 15, *longipennis*, Mexico, p. 130, *atratus*, Mexico to Panama, *emmenastoides*, fig. 22, Mexico and Guatemala, p. 131, *obliteratus*, Panama, p. 132, *id. t. c.*

Notibius affinis, pl. vi. fig. 11, *rugipes*, Mexico, p. 132, *id. t. c.*

Ulus hirsutus, p. 133, pl. vi. fig. 13, Mexico to Panama, *lineatulus*, p. 134, fig. 14, Guatemala, *id. t. c.*

Conibius brunnipes, Mexico and Guatemala, *id. t. c.* p. 133, pl. vi. fig. 12.

Opatrinus atratus, W. Africa, Qued., B. E. Z. xxix. p. 8.

Opatrides.

Melambius teinturieri, Muls. (= *M. asperocostatus*, Fairm.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 87.

Paraphylax squamiger, Broun, figured; Waterh., Aid, iii. pl. cliii. fig. 2.

Trichoton lapidicola, Nicaragua, Venezuela, *curvipes*, Panama, pl. vi. fig. 25, p. 136, spp. nn., Champion, Biol. Centr. Am. *Col.* iv. (1).

Cnemeplatia laticollis, Panama, sp. n., p. 136, pl. vi. fig. 24, *id. t. c.*

Anomalipus decosteri, Delagoa Bay, sp. n., Pering., Tr. S. Af. Soc. iii. p. 117.

Brachyidium aspericolle, Sumatra or Borneo, sp. n., Fairm., C.R. ent. Belg. 1885, p. cviii.

Penthicus vulneratus, Turkestan, sp. n., Kr., Deutsche e. Z. xxix. p. 293.

Trachyscelides.

The three species of *Phaleria* found in France discussed; Fauv., Rev. d'Ent. iv. pp. 318–320.

Bycrea villosa, Pasc. Metamorphoses; Dugès, Ann. Ent. Belg. xxix. (2) pp. 51–54, pl. iv. figs. 1–25.

Anemia crispa, Quango, sp. n., Qued., B. E. Z. xxix. p. 9.

Bolitophagides.

Heledona hellenica, Eubœa, sp. n., Reitt., Deutsche e. Z. xxix. p. 381.

Diaperides.

Tritoma bifacies, Walk. [*cf. Nitidulidæ, ante* !].

Ceropria anthracina, Lac.? Diagnosis of; Qued., B. E. Z. xxix. p. 11.

Platydema obscurum, sp. n., Sharp, Tr. R. Dublin Soc. (2) iii. p 166.

Hemicera alternicolor, Borneo or Sumatra, sp. n., Fairm., C.R. ent. Belg. 1885, p. cx.

Ulomides.

Sciophagus, g. n., for *Heterophaga pandanicola*, Esch., figured on pl. v. fig. 27; Sharp, Tr. R. Dublin Soc. (2) iii. p. 167.

Stenoscapha, g. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 234 (next to *Pygidiophorus caroli*), for *S. spissicornis*, sp. n., Fairm., *op. cit.* p. 235, Madagascar.

Holaniara picescens, Sumatra or Borneo, sp. n., *id.* C.R. ent. Belg. 1885, p. cix.

Toxicum giganteum, Java, *gazellæ* and var. *obtusum*, p. 201, *diversepunctatum*, p. 202, Celebes, *nitidifrons*, p. 201, *opacum*, p 202, Caffraria, *tenuiclavum*, Old Calabar, *indicum*, India, *elongatum*, Philippines, p. 202, spp. nn., Schauf., Hor. Ent. Ross. xix.

Cossyphides.

Endustomus bicaudatus, Quango, sp. n., Qued., B. E. Z. xxix. p. 12, pl. iii. fig. 3.

Eutelides.

Diceroderes mexicanus noticed; Champion, Biol. Centr. Am. *Col.* iv. (1) p. 96.

Conophthalmus, g. n., p. 13, for *C. setulosus*, sp. n., Quango, p. 14; Qued., B. E. Z. xxix.

Tenebrionides.

Champion, Biol. Centr. Am. *Col.* iv. (1), notices or figures certain forms already known, viz.:—*Scotobænus*, Lec., *Centronopus suppressus*, pl. v. fig. 9; *Rhinandrus*, Lec., of which *Exerestus*, Bates, and *Proderops*, Fairm., are synonyms, *R. elongatus*, Horn. (= *E. jansoni*, Bates,

= *P. foraminosus*, Fairm.), *foveolatus*, pl. v. fig. 11, *helopioides*, fig. 12; *Zophobas laticollis*, fig. 14; *Tauroceras angulatum*, fig. 17.

New genera and species :—

Mitys, Champion, *t. c.* p. 97, for *M. inflatus*, p. 97, pl. v. fig. 7, *lævis*, fig. 6, *opacus*, p. 98, Mexico, spp. nn.

Œnopion, *id. t. c.* p. 98, for *Œ. gibbosus*, sp. n., p. 99, pl. v. fig. 8.

Pyres, *id. t. c.* p. 100, for *P. metallicus*, Nicaragua, pl. v. fig. 10, *batesi*, Bogota, p. 101.

Nuptis (? Motsch.), *id. t. c.* p. 107, for *N. cornutus*, Guatemala to Brazil, p. 108, *inquinatus*, pl. v. fig. 21, Guatemala, *caliginosus*, fig. 20, p. 109, Mexico, *validus*, fig. 22, *tenebrosus*, fig. 23, Mexico and Guatemala, *corticalis*, Nicaragua, Panama, spp. nn., Champion, *t. c.*

Œatus, *id. t. c.* p. 111, for *Œ. chevrolati*, sp. n., Mexico to Costa Rica, *ibid.* pl. v. fig. 18.

Hicetaon, *id. ibid.*, for *H. frontalis*, sp. n., Mexico and Honduras, p. 112, pl. vi. fig. 8.

Sthenobœa, *id. t. c.* p. 112, for *S. apicalis*, sp. n., Mexico, p. 113, pl. vi. fig. 1, and one or two undescribed S. American species, viz., *Ipthimus brevicollis*, Laf., and *I. undulatus*, Chev.

Isicerdes, *id. t. c.* p. 114, for *I. occultus*, Mexico to Panama, pl. vi. fig. 2, *funebris*, Guatemala, p. 114, *attenuatus*, Colombia, p. 115.

Hesiodus, *id. t. c.* p. 115, to include (? *Haplandrus ater*, Lec.) *H. longitarsis*, p. 115, pl. vi. fig. 7, Mexico, Nicaragua, *sordidus*, Mexico, Brazil, *jansoni*, Nicaragua, *conspurcatus*, Panama, *brasiliensis*, Ega, p. 116, *debilis*, Guatemala, p. 117, spp. nn.

Ilus, *id. t. c.* p. 117, for *I. apicicornis*, sp. n., Costa Rica, p. 118, pl. vi. fig. 3.

Choaspes, *id. t. c.* p. 118, for *C. purpureus*, pl. vi. fig. 4, Brit. Honduras to Panama, *angulicollis*, fig. 5, Nicaragua, p. 119, spp. nn., and one or two undescribed species from Brazil.

Rhacius (position doubtful, perhaps near *Bius*, Muls.), *id. t. c.* p. 120, for *R. sulcatulus*, pl. vi. fig. 9, Central and S. America and Antillles, *quadricollis*, fig. 10, Brit. Honduras to Colombia, p. 121, spp. nn., *id. t. c.*

Centronopus grandicollis, p. 100, Champion, *t. c.*

Rhinandrus sublævis, Arizona, Horn, Tr. Am. Ent. Soc. xii. p. 160; *R. obsoletus*, p. 102, pl. v. fig. 15, Mexico, Champion, *t. c.*

Zophobas pedestris, p. 103, pl. v. fig. 16, Nicaragua, *signatus*, fig. 13, p. 104, Brit. Honduras, Nicaragua, *kraatzi*, p. 105, Guatemala, *id. t. c.*

Nyctobates procerus, p. 107, pl. v. fig. 19, Mexico to S. America, *id. t. c.*; *N. brevitarsis*, *bifasciatus*, pl. iii. figs. 5 & 5*a*, *b*, p. 16, *N.* (*Hemerobates*) *iphthinoides*, p. 15, Quango, Qued., B. E. Z. xxix.

Glyptotus nitidus, p. 113, pl. v. fig. 24, Mexico, Nicaragua, Champion, *t. c.*

Eupsophus horni (position doubtful), Mexico, *id. t. c.* p. 122.

Cnodalonides.

Camaria sp.? noticed in note on Orchis beetles; Gard. Chron. (2) xxiii. p. 642.

Waterhouse, Aid, iii. pl. cliii., figures *Immedia occulta*, Pasc., fig. 1, and *Calydonis refulgens*, Pasc., fig. 7.

Perichilus, g. n., p. 18, near *Titæna*, for *P. brevicornis*, Quango, sp. n., p. 19, pl. iii. fig. 6. ; Qued., B. E. Z. xxix.

Chremolamus villosipes, sp. n., Fairm., Ann. Soc. Ent. Fr. (6) iv. p. 236, Madagascar.

Eucyrtus punctato-lineatus, carbunculus, spp. nn., Borneo or Sumatra, *id.* C.R. ent. Belg. 1885, p. cix.

Helopides.

Diopethes arachnoides, Pasc., fig. 3, *Phymæus pustulosus*, Pasc., fig. 4, *Gnesis helopioides*, Pasc., fig. 6, figured by Waterh., Aid, iii. pl. clviii.

Mylops, Fairm., is a synonym of *Hydromedion*, Waterh., but *M. magellanicum*, Fairm., for which it was proposed, is a distinct species from *H. elongatum*, Waterh. ; both are characterized : Fairm., Ann. Soc. Ent. Fr. (6) v. pp. 51 & 52. Also suggested, p. 53, that *Helops oblongiusculus*, Blanchd., belongs to the genus.

Perimylops, Müller, considered as a genus intermediate between *Chitoniscus* and *Hydromedion*; Fairm., *t. c.* p. 49.

Two species of *Helops*, mixed in Belgian collections as *H. striatus*, have very different forms of spermatozoa; De Borre, C.R. ent. Belg. 1885, p. xxvi.

Helops grajus var. n. *cubæicus*, Reitt., Deutsche e. Z. xxix. p. 382.

Læna. Table of species of ; *id. t. c.* p. 398.

New genus and species :—

Brachyhelops, very near *Parahelops*, Fairm., Ann. Soc. Ent. Fr. (6) v. p. 57, for *B. hahnii*, sp. n., *ibid.*, Orange Bay.

Adelium hanseni, nigritulum, New Zealand, Broun, N. Z. J. Sci. ii. pp. 385 & 386.

Læna alternata, Turkey, *oertzeni*, Crete, *libanotica*, p. 401, *parvula*, Lebanon, *schwarzi*, Corfu, p. 402, Reitt., Deutsche e. Z. xxix.

Hydromedion distinguendum, Cape St. Martin, p. 53, *anomocerum*, summit of Choungougon, p. 54, Fairm , Ann. Soc. Ent. Fr. (6) v.

Parahelops angulicollis, *id. t. c.* p. 56, Terra del Fuego.

Helops strigicollis, California, Horn, Tr. Am. Ent. Soc. xii. p. 161 ; *H. glabriventris*, Eubœa, Reitt., Deutsche e. Z. xxix. p. 382.

Megacanthides.

Note on Lacordaire's definition of the tribe ; Qued., B. E. Z. xxix. p. 20.

Alymon prolatus, Pasc., figured; Waterh., Aid, iii. pl. clviii. fig. 8.

Asthenochirus, g. n., near *Hoplonyx*, for *A. nigropunctatus, velutinus*, E. Africa, spp. nn. ; Fairm., C.R. ent. Belg. 1885, p. viii.

Hoplonyx anthracinus, p. 21, *brunneus*, p. 22, *ocipennis*, p. 23, pl. iii. figs. 7 & 7*a*, *b*, Quango, spp. nn.; Qued., B. E. Z. xxix.

Amarygmides.

Paramarygmus, g n., between *Amarygmus* and *Nesioticus*, for *P.*

nigroæneus, sp. n., Quango ; Qued., B. E. Z. xxix. pp. 24 & 25, pl. iii. figs. 9 & 9*a*, *b*.

Eupezus rufipes, W. Africa, sp. n., *id. t. c.* p. 24, pl. iii. figs. 8 & 8*a*, *b*.

Strongyliides.

Œnomia femorata, Pasc., fig. 5, *Diestica viridipennis*, Pasc., fig. 9, figured by Waterh., Aid, iii. pl. clviii.

Strongylium cærulescens, *marginipenne*, p. 27, *semiæneum*, p. 28, Quango, spp. nn., Qued., B. E. Z. xxix.

Praogena aurichalcea, p. 30, *gracilis*, p. 31, *æneola*, p. 32, *subovata*, p. 33, pl. iii. fig. 10, spp. nn., *id. t. c.*

Dysgena fuliginosa, Quango, sp. n., *id. t. c.* p. 33.

Cistelidæ.

[*Cf.* Quedenfeldt (261).]

Chromomæa picta, Pasc., figured ; Waterh., Aid, iii. pl. clviii. fig. 1.

Labetis tibialis, Waterh., ♂ described ; Blkn., Tr. R. Dublin Soc. (2) iii. p. 167.

Cteniopus græcus, Heyd., ♂ described ; Reitt., Wien. ent. Z. iv. p. 273. =

Podonta tenuis, Kr. (= *hirtipennis*, Sols.), Heyd., Deutsche e. Z. xxix. p. 281. *P. morio*, Kies. (= *elongata*, Faust), Reitt., Deutsche e. Z. xxix. p. 383.

Allecula cinnamomea, p. 35, *mechowi*, p. 36, Quango, spp. nn., Qued., B. E. Z. xxix.

Cistela æreo-nitens, Quango, *id. t. c.* p. 37 ; *C. crassicornis*, Oahu, Sharp, Tr. R. Dublin Soc. (2) iii. p. 168, pl. iv. fig. 25 : spp. nn.

Isomira bispilosa, Oran, sp. n., Desb., Col. Nord. Afr. ii. p. 99.

Podonta daghestanica, Caucasus, sp. n., Reitt., Deutsche e. Z. xxix. p. 383.

Melandryidæ.

The genera *Phlœotrya*, *Dircæa*, and *Dolotarsus* ; nomenclature discussed, *Dircæa* being treated as a synonym of *Serropalpus*, while *Dolotarsus* is to be suppressed, as founded on a monstrosity ; the synonymy of some of the species is also noticed : Fauv., Rev. d'Ent. iv. pp. 133–137.

Dircæa riversi, California, sp. n., Lec., Tr. Am. Ent. Soc. xii. p. 29.

Lagriidæ.

Adynata entrapeloides, Transvaal, sp. n., Pering., Tr. S. Af. Soc. iii. p. 117.

Entrapela plagiata, p. 118, *cingulata*, p. 119, *metallescens*, p. 120, Natal, *amabilis*, p. 119, *flavipennis*, p. 120, Transvaal, *proxima*, *unicolor*, Cape Colony, p. 121, spp. nn., *id. t. c.*

Pedilidæ.

Macratria leprieuri, Reiche (= *Steropes hungaricus*, Hampe), Reitt., Deutsche e. Z. xxix. p. 385.

Scraptia revelieri, Corsica, sp. n., Ab., Rev. d'Ent. iv. p. 157.

Euglenes sericornis, Mehadia, *punctatissimus*, Greece, *nodicollis*, Dalmatia, spp. nn., Reitt., Deutsche e. Z. xxix. p. 384.

Anthicidæ.

Note on validity and specific characters of *Notoxus delicatus*; Casey, Bull. Cal. Ac. Sci. i. p. 333.

Anthicus antherinus and *laeviceps*, characters of; Rev. d'Ent. iv. p. 125. *A. lameyi* and *coniceps*, characters of; *t. c.* p. 158.

Anthicus gracilior, S. France, p. 159, *4-decoratus*, Corsica, p. 60, Ab., *t. c.*; *A. minor*, New Zealand, Broun, N. Z. J. Sci. ii. p. 386; *A. mundulus*, Oahu, Sharp, Tr. R. Dublin Soc. (2) iii. p. 168: spp. nn.

Formicomus rufescens, Natal, sp. n., Pering., Tr. S. Af. Soc. iii. p. 122.

Notoxus sericeus, Cape Colony, *id. ibid.*; *N. sectator*, p. 51, *insitus*, p. 54, Cent. Africa, Qued., Ent. Nachr. xi.: spp. nn.

Mordellidæ.

Anaspis defarguesi, S. France, sp. n., Ab., Rev. d'Ent. iv. p. 161.

Rhipidiphoridæ.

Metœcus paradoxus excretes a fluid agreeable to the wasps amongst which it is found; Ent. Nachr. xi. p. 34.

Cantharidæ.

Cantharide [sic]. Note on early stages of; Beauregard, Bull. Soc. Ent. Fr. (6) v. p. cxviii. *Meloidæ*, *cf.* Horn (147).

Melœtyphus fuscus figured; Waterh., Aid, iii. pl. clxi. fig. 4.

**Meloe*. Monographie der europäischen Arten der Gattung *Meloe*, von Dr. Fred. Katter, Beiheft to Jahrbüch des Pädagogiums zu Putbus 1882–1883 & 1884–1885. [*Cf.* S. E. Z. xlvi p. 382.]

Meloe sulcicollis, Kr. (= *xanthomelas*, Sols.), Heyd., Deutsche e. Z. xxix. p. 281.

Mylabris baulnyi, Mars., is a variety of *M. tenebrosa*, Cast.; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 87.

Cerocoma. Table of the species; Reitter, Deutsche e. Z. xxix. pp. 12–14, with *C. ephesica*, sp. n., Ephesus, p. 12.

Epicauta verticalis is parasitic in the nests of crickets; C.R. Soc. Biol. (8) i. p. 264.

Epicauta maculata, Say, var. (= *conspersa*, Lec., = *C. punctuata*, Dug.); *C. ocellata* is another var. of same; *E. corvina*, Lec. (= *C. nigerrima*, Dug.); *E. cinerea*, Forst. (= var.? *cinctipennis*, Chev.); another var. of same (= *C. stigmata*, Dug.); *Cantharis puberula*, Lec. (= *variabilis*, Dug.); *Tetranonyx fulvus*, Lec. (= *rufus*, Dug): Horn, Tr. Am. Ent. Soc. xii. pp. 107 & 108. *Macrobasis longicollis*, Lec. (= *sublineata*, Lec.); *id. t. c.* p. 109.

Meloe cinereovariegatus, Turkestan, Heyd., Deutsche e. Z. xxix. p. 294 ; *M. hottentotus*, *caffer*, S. Africa, Pering., Tr. S. Af. Soc. iii. p. 123 : spp. nn.

Horia anguliceps, sp. n., Borneo or Sumatra, Fairm., C.R. ent. Belg. 1885, p. cxi.

Cissites debyi, sp. n., Borneo or Sumatra, *id. ibid.*

Diaphorocera obscuritarsis, sp. n., Biskra, *id.* Bull. Soc. Ent. Fr. (6) v. p. xxxviii.

Cantharis sanguiniceps, sp. n., Biskra, *id. ibid.* : belongs to *Epicauta* ; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 87. *C. molesta*, California, sp. n., Horn, *t. c.* p. 111.

Mylabris lameyi, sp. n., Algeria, Mars., Nouv. et faits, 36', p. cxlvii.

Macrobasis lauta, Arizona, sp. n., Horn, Tr. Am. Ent. Soc. xii. p. 108.

Epicauta insignis, p. 110, *fallax*, p. 111, spp. nn., N. America, Horn, *t. c.*

Pyrota invita, p. 114, *bilineata*, p. 115, *dubitabilis* (= *vittigera*, Lec.), p. 113, N. America, spp. nn., Horn, *t. c.*

Œdemeridæ.

Œdemera immunda, Lenkoran, *rubricollis*, Syria, *ostralis*, Caucasus, spp. nn., Reitt., Deutsche e. Z. xxix. p. 386.

Ananca collaris, sp. n., Oahu, Sharp, Tr. R. Dublin Soc. (2) iii. p. 169.

Aglycyderidæ.

Proterhinus, synopsis of species of ; Blkn., Tr. R. Dublin Soc. (2) iii. pp. 174–176. *P. linearis*, *scutatus*, p. 169, *similis*, *laticollis*, p. 170, *tarsalis*, *robustus*, p. 171, Blkn., *ineptus*, *ibid.*, *integer*, *detritus*, p. 172, *longicornis*, p. 173, *insignis*, *ibid.* pl. v. figs 44 & 45, Sharp, spp. nn., Hawaiian Arch. *P. paradoxus*, fig. 36, *vestitus*, figs. 37 & 38, *sternalis*, fig. 39, *dispar*, figs. 40 & 41, *lecontei*, figs. 42 & 43, figured, *t. c.* pl. v.

Curculionidæ.

[*Cf.* Aurivillius (12), Bedel (19), Desbrochers (89), Faust (102–105), Pascoe (240), Rœlofs (289), Stierlin (333).]

Food plants and habits of *Curculionidæ* ; Bargagli (17).

Pseudophytobius N. 6 [*sic*], presumably g. n., without indication of allies or systematic position ; Desb., Col. Nord. Afr. ii. p. 96, for *P. saltator*, sp. n., Algeria, p. 97.

Microcerides.

Gyllenhalia, g. n., placed in *Microcerinæ*, for *Brachycerus spectrum*, Fab.; Auriv., Œfv. Ak. Förh. 1885, No. 7, p. 20.

Episus elongatus, p. 8, *peringueyi*, *westermanni*, p. 9, Cape G. H., *fahræi*, *decylderi*, Damara, *robustus*, *opalinus*, p. 10, *impressicollis*, p. 11, Cape

G. H., *gravidus*, Vaal River, *dohrni*, Caffraria, p. 11, *bohemani*, Damara, *oberthuri*, Senegal, p. 12, *rotundicollis*, Cape G. H., *gibbosus*, Caffraria, p. 13, *rœlofsi*, *nodicollis*, Cape G. H., p. 14, *punctatus*, Cape G. H., p. 15, *angulicollis*, Caffraria, p. 16, Auriv., *t. c.*, spp. nn.

Microcerus borrei, Afr. mer. occ., p. 18, *depressus*, Caffraria, p. 19, *oblongus*, Namaqua, p. 20, *id. t. c.*, spp nn.

Protomantus peringueyi, *elegans*, Cape G. H., spp. nn., *id. t. c.* p. 21.

Brachyderides.

Curculionidæ Adelognathi: Faust has some important observations on the classification of; Deutsche e. Z. xxix. pp. 164–167.

Leptolepyrus (sub *Cneorhinus*) *meridionalis*, Duv. (= *Rhinognathus globulatus*, Fairm.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 87.

Thylacites and *Scythropus*. Desb., Col. Nord Afr. ii. pp. 13 *et seq.*, redescribes numerous species of these genera; tabulates the latter, pp. 18–22; the former, pp. 53–76; and gives, pp. 77–80, notes on species of *Thylacites* unknown to him, and, p. 81, a catalogue of the described species (61 in number).

Sitones fallax, Rosenh. (= *S. blanchardi*, Allard); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 88.

Sitona lineata and other species. Ravages and remedies; Orm., Rep., viii. p. 3.

Polydrusus cervinus var. (= *P. nodulosus*, Chev.); Rev. d'Ent. iv. p. 128.

Ecophthalmus doublieri, Guer. Note on specific validity of; Dohrn, S. E. Z. xlvi. p. 63.

Brachyomus quadrinosus, Boh. An example of this Brazilian species captured at large at Vernet, in France; Buysson, Bull. Soc. Ent. Fr. (6) v. p. xl.

Shelopius, Desb. (= *Tanycnemus*, Faust). Systematic position and characters discussed; Faust, S. E. Z. xlvi. pp. 158 & 159.

Apocyrtus nitidulus, *wallacei*, and *? satelles*, are probably varr. of *Cuculio æneus*, Fab.; Pasc., Ann. Mus. Genov. (2) ii. p. 208.

New genera and species:—

Antarctobius, p. 58, near *Barynotus* and *Catoptes*, for *A. hyadesii*, *ibid.*, Beagle Straits, and *lacunosus*, p. 59, *dissimilis*, p. 60, spp. nn., Orange Bay; Fairm., Ann. Soc. Ent. Fr. (6) v.

Anomoederus, g. n. *Tanymecinorum*, p. 65, to include *Dereodus acuminatus*, Er., and *A. gerstaeckeri*, sp. n., Riv. Quango; Faust, Ent. Nachr. xi. p. 66.

Orthomias, g. n. *Tanymecinorum*, for *O. seriatus*, sp. n., Transvaal; *id. t. c.* p. 72.

Ischnomias, g. n. *Cyphinorum*, p. 87, for *I. nobilis*, sp. n., Quango Riv., p. 88; *id. t. c.*

Platyrhamphus, near *Shelopius*, p. 158, for *P. akini*, sp. n., p. 159, Turkestan; *id.* S. E. Z. xlvi.

Blosyrus? trivialis, Turkestan, *id.* Deutsche e. Z. xxix. p. 162.

Catapionus peregrinus, *molitor*, p. 150, *eximius*, *insulsus*, p. 151, Turkestan, Faust, S. E. Z. xlvi.

Strophosomus (*Neliocarus*) *kirschi*, Lake Nyassa, *id.* Ent. Nachr. xi. p. 90; *S. globosus*, p. 100, *reitteri*, Spain, *pusillus*, S. Portugal, p. 103, Stierl., MT. schw. ent. Ges. vii.

Strophomorphus caspicus, West Persia, p. 106, *hebræus*, Syria, *barbarus*, Algeria, p. 108, *id. t. c*; *S. virescens*, Turkestan, Faust, S. E. Z. xlvi. p. 149.

Eusomus laticeps, p. 111, Dobrudscha, *aurovittatus*, p. 114, Portugal, Stierl., MT. schw. ent. Ges. vii.

Brachyderes auriger, Oran, Desb., Col. Nord. Afr. ii. p 9; *B. reitteri*, Spain, Stierl., MT. schw. ent. Ges. vii. p. 121.

Thylacites biskrensis, p. 41, *aurovittatus*, p. 42, *multiseriatus*, p. 44, *depilatus*, p. 49, *æneseens*, p. 51, N. Africa, *lusitanicus*, p. 55, Portugal, *squameus*, p. 57, Hispan. mer., *intermedius*, p. 58, Portugal, *substriatus*, p. 61, *perezi*, p. 71, Desb., Col. Nord. Afr. ii.

Ottistira irrorata, p. 202, N. Guinea, *mixta*, p. 203, Aru I., Pasc., Ann. Mus. Genov. (2) ii.

Rhinoscapha generosa, *albertisii*, p. 204, *perversa*, N. Guinea, *albipennis*, Yule I., *scalaris*, pl. i. fig. 12, Moluccas, p. 205, *beccarii*, *doriæ*, fig. 11, N. Guinea, p. 206, *id. t. c.*; *R. uniformis*, Aneiteum and Solomon I., Waterh., Ann N H. (5) xv. p. 382.

Dermatodes elevatus, Java, *designatus*, Sumatra, Pasc., Ann. Mus. Genov. (2) ii. p. 207.

Platyomicus quadrituberculatus, Quango Riv., Faust, Ent. Nachr. xi. p. 75.

Tanymecus (*Esamus*) *albilaterus*, p. 183, (*E.*) *nothus*, p. 184, Turkestan, *id.* Deutsche e. Z. xxix.; *T. fausti*, N. Africa, Desb., Col. Nord. Afr. ii. p. 26.

Cimbus umbratus, Quango Riv., p. 67, *barbicauda*, Lake N'Gami, p. 68, Faust, Ent. Nachr. xi.

Dereodus schönherri, p. 69, Damara-land, *vagabundus*, p. 71, Quango Riv., *id. t. c.*

Molybdotus angustus, Somali, *id. t. c.* p. 73.

Hypomeces impressicollis, Zambesi, p. 125, *modestus*, Transvaal, p. 126, Pering., Tr. S. Af. Soc. iii.

Polyclæis maculatus, p. 124, *variegatus*, p. 125, Zambesi, *id. t. c.*

Mesagroicus affaber, p. 152, *petræus*, *insipidus*, p. 153, Faust, S. E. Z. xlvi.

Sitones bedeli, Turkestan, *id. t. c.* p. 157; *S. hipponensis*, p. 2, *hirsutus*, p. 4, *argentellus*, p. 5, Algeria, Desb., Col. Nord. Afr. ii.; *S. damascenus*, p. 125, *syriacus*, *hebræus*, p. 127, Syria, Stierl., MT. schw. ent. Ges. vii.

Polydrusus oberthuri, Algeria, Desb., Col. Nord. Afr. ii. p. 6.

Phacephorus russicus, p. 181, *hirtellus*, p. 182, Turkestan, Faust, Deutsche e. Z. xxix.

Xylinophorus prodromus, Turkestan, *id. t. c.* p. 177.

Piazomias modestus, p. 178, *vermiculosus*, p. 180, *nanus*, p. 181, Turkestan, *id. t. c.*

Geochus rugulosus, New Zealand, Bronn, N. Z. J. Sci. ii. p. 386.

Nicevana cinerea, New Zealand, *id. ibid.*

Otiorrhynchides.

Epicærus imbricatus, Say. Depredations, p. 300; figured, pl. iii. fig. 5; Riley, Rep. Ent.

Siteutes cæruleatus, Pasc., figured; Waterh., Aid, iii. pl. clxi. fig. 5.

Coptorhynchus albolineatus var. (= *I. scaposus*, Pasc.); Pasc., Ann. Mus. Genov. (2) ii. p. 210.

Otiorrhynchus, Germ., divided into subgenera (with three new names); Goz., Rev. d'Ent. iv. p. 126.

Table of distinctive characters of *Cyrtolepus*, *Holcorhinus*, *Cyclomaurus*, and *Mylacus*; Faust, B. E. Z. xxix. p. 235.

Omias hanaki. Note on; Weise, Deutsche e. Z. xxix. p. 408.

Corigetini. Table of this and allied groups; Faust, Deutsche e. Z. xxix. pp. 164–167.

Corigetus. To this genus refer *Platytrachelus exquisitus* and *marmoratus*, Faust, the former trivial name being now replaced by that of *kirghisicus*; *id. t. c.* pp. 164 & 170.

New genera and species:—

Phraotes, near *Celeuthetes*, p. 208, for *P. tuberculatus*, pl. i. fig. 4, p. 209, New Guinea, sp. n.; Pasc, Ann. Mus. Genov. (2) ii.

Rhyncogonus, p. 176, near *Elytrogonus*, for *R. blackburni*, pl. v. fig. 28, and *vestitus*, p. 177, Hawaiian Arch., spp. nn.; Sharp, Tr. R. Dublin Soc. (2) iii. p. 177.

Synomus, near *Myllocerus*, for *S. cephalotes*, Cape York, sp. n.; Pasc., Ann. Mus. Genov. (2) ii. p. 217.

Apirocalus gestroi, Yule I., *id. t. c.* p. 209, pl. i. fig. 3.

Celeuthetes setiger, Yule I., *id. t. c.* p. 210.

Coptorhynchus gestroi, Cape York, *griseus*, Goram, *inornatus*, Ternate, *servilis*, p. 211, *ligatus*, *mœrens*, *immitis*, p. 212, *crassirostris*, New Guinea, *beccarii*, *disjunctus*, Celebes, p. 213, *quinarius*, *leucostictus*, New Guinea, *guttatus*, pl. ii. fig. 4, Yule I., p. 214, *id. t. c.*

Otiorrhynchus retowski, Caucasus, Reitt., Deutsche e. Z. xxix. p. 387; *O. tenuis*, Turkestan, Stierl., *t. c.* p. 294; *O. tuberculatus*, *obtusioides*, Karst., *id. t. c.* p. 272; *O.* (*Tournieria*) *starcki*, W. Caucasus, Retowski, Wien. ent. Z. iv. p. 10.

Axyrœus oertzeni, Crete, Reitt., Deutsche e. Z. xxix. p. 388.

Cyrtolepus insidiosus, Algeria, Faust, B. E. Z. xxix. p. 234.

Cyclomaurus bonnairei, Algeria, *id. t. c.* p. 233.

Mylacus pennatus, Algeria, *id. t. c.* p. 235.

Nastus luteosquamosus, Turkestan, Heyd., Deutsche e. Z. xxix. p. 295.

Barypeithes nitidulus, Algeria, Faust, B. E. Z. xxix. p. 236; *B. carpathicus*, Carpathians, Reitt., Deutsche e. Z. xxix. p. 388.

Piochus aurichalceus, Turkestan, Faust, Deutsche e. Z. xxix. p. 163.

Trachyphlœus maroccanus, p. 139, Morocco, *desbrochersi*, Oran, *muricatus*, Spain, p. 141, Stierl., MT. schw. ent. Ges. vii.; *T. rugosus*, New Zealand, Broun, N. Z. J. Sci. ii. p. 386.

Cathormiocerus carpetanus, p. 365, *porculus*, p. 367, *bolivari*, p. 370, *proximus*, p. 372, *elongatulus*, p. 374, Spain, Uhag., An. Soc. Esp. xiv.; *C.*

syriacus, p. 142, Syria, *reitteri*, p. 143, Spain, *maroccanus*, p. 144, Morocco, Stierl., MT. schw. ent. Ges. vii.

Pholicodes desbrochersi, p. 109, *pusillus*, p. 110, Asia Minor, *id. t. c.*

Phyllobius fulvagoides, Crete, p. 387, *euchromus*, Greece, p. 392, Reitt., Deutsche e. Z. xxix. ; *P. exaquatus*, p. 162, *solskyi*, p. 163, Turkestan, Faust, Deutsche e. Z. xxix. p. 163.

Mylloceras trepidus, *duplicatus*, p. 215, *modestus*, *chrysideus*, *gratus*, p. 216, Cape York, Pasc., Ann. Mus. Genov. (2) ii.

Corigetus sellatocollis, p. 170, *trepidus*, p. 171, *capito*, *heydeni*, p. 172, *armiger*, p. 173, *turkestanicus*, p. 174, *paradoxus*, p. 175 ; *Eusomidius* subg. n., p. 176, *E. clavator*, p. 176, *angustus*, p. 177, Turkestan : Faust, Deutsche e. Z. xxix.

Eremnides.

Chloëbius contractus, p. 184, *latifrons*, p. 185, spp. nn., Faust, Deutsche e. Z. xxix.

Phytoscaphus onustus, Celebes, *erro*, Java, &c., p. 217, *suturalis*, Sumatra, p. 218, spp. nn., Pasc., Ann. Mus. Genov. (2) ii.

Leptopsides.

Lysizone alternata and *Lipothyrea chloris*, Pasc., figured; Waterh., Aid, iii. pl. clvii. figs. 6 & 7.

Stenocorynus marginatus, Cape York, sp. n., Pasc., Ann. Mus. Genov. (2) ii. p. 218.

Deracanthus costatus, Turkestan, sp. n., Heyd., Deutsche e. Z. xxix. p. 295.

Brachycerides.

[*Cf.* Aurivillius (12).]

Brachycerus tursio var. *insignis*, p. 127, pl. ii. fig. 3, *squamosus*, p. 128, pl. ii. fig. 4, *albotectus*, p. 129, pl. ii. fig. 5, *lobaticollis*, p. 131, pl ii. fig. 2, *rotundatus*, p. 136, pl. ii. fig. 6, Damara-land, *intermedius*, p. 127, *impressicollis*, p. 130, pl. ii. figs. 1 & 1*a*, Transvaal, *speciosus*, p. 131, pl. iii. fig. 1, Namaqualand, *consimilis*, p 133, pl. iii. fig. 2, *spinipes*, p. 133, pl. iii. fig. 4, *cristatus*, p. 134, pl. ii. fig. 7, *nudus*, p. 135, pl. iii. fig. 3, spp. nn., Pering., Tr. S. Af. Soc. iii.

Theates ludificator, N'Gami, sp. n., Auriv., Œfv. Ak. Förh. 1885, No. 7, p. 22.

Dinomorphides.

Brachyceropsis, g. n., placed in *Dinomorphinæ*, for *Brachycerus tuberculosus*, Gyl. (= *verrucosus*, Fab.) ; Auriv., *t. c.* p. 24.

Byrsopsides.

Rhytirhinus saintpierrei, Allard (= *R. gentilis*, Fairm.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 88.

Rhytirhinus socius, Algeria, sp. n., Faust, B. E. Z. xxix. p. 237.

Gronops oranensis, Algeria, sp. n , *id. t. c.* p. 238.

Synthocus paradoxus, p. 137, pl. iii. figs. 5 & 5*a*, *plagosus*, p. 138, S.

Africa, *sagittarius*, p. 139, *sordidus*, p. 140, Damara-land, spp. nn., Pering., Tr. S. Af. Soc. iii.

Somatodides.

Somatodes bidentatus, Cape of Good Hope, sp. n., Pering., Tr. S. Af. Soc. iii. p. 141.

Oncylotrachelus punctifrons, Transvaal, sp. n., *id. t. c.* p. 142.

Hipporhinides.

Hipporhinus transvaalensis, sp. n., *id. t. c.* p. 142.

Rhyparosomides.

Ergias, g. n., for *E. turbatus*, New Guinea, sp. n.; Pasc., Ann. Mus. Genov. (2) ii. p. 219.

Miotus, g. n., for *M. styphloides*, New Guinea, sp. n.; *id. t. c.* pp. 219 & 220.

Erymneus longulus, *cœnosus*, New Zealand, spp. nn., Broun, N. Z. J. Sci. ii. p. 386.

Cylindrorhinides.

Macrotarsus faldermanni var. *asininus*, Turkestan, Faust, S. E. Z. xlvi. p. 160; *M. baskarensis*, Turkestan, sp. n., *id. t. c.* p. 161.

Inophlœus costifer, New Zealand, Broun, sp. n., N. Z. J. Sci. ii. p. 386.

Empœotes æquus, New Zealand, sp. n., *id. t. c.* p. 387.

Molytides.

Acrisius noticed by Lec., Tr. Am. Ent. Soc. xii. p. 29.

Euthycus, g. n., for *E. macilentus*, Java, sp. n.; Pasc., Ann. Mus. Genov. (2) ii. p. 220, pl. i. fig. 6.

Euthycodes, g. n., for *E. beccarii*, Sumatra, sp. n.; *id. t. c.* p. 221.

Apachiscelus (Desb.) *alternans*, Turkestan, sp. n., Faust, S. E. Z. xlvi. p. 173.

Scythropides.

Scythropus oxycedri, Fairm. (= *S. longus*, Desb.), and *S. pineti*, Fairm. (= *socius*, Desb.); *S. phœnicius*, Fairm. (= *Polydrusus oberthuri*, Desb.), but the species belongs really to *Polydrusus*: Fairm., Bull. Soc. Ent. Fr. (6) v. p. liii.

Scythropus longus, p. 11, *socius*, p. 13, Algeria, *metallicus*, U. S. N. America, p. 21, note, spp. nn., Desb., Col. Nord Afr. ii.

Hyperides.

Bubalocephalus, *Macrotarsus*, and allied genera, important note on, with table; Faust, B. E. Z. xxix. pp. 115–118.

Phytonomus punctatus, Fab. Appearance in America; Rep. E. Soc. Ont. xv. p. 32, &c.

Alophus subnudus, p. 154, *eximius*, p. 155, *pauperculus*, p. 156, Faust, S. E. Z. xlvi.; *A. stierlini*, Bosnia, Reitt., Deutsche e. Z. xxix. p. 211: spp. nn.

Cleonides.

Temnorhinus elongatus, Gyll. (= *Bothynoderes nasutus*, Hoch.), Faust, S. E. Z. xlvi. p. 162.

Bothynoderes carinatus, Zoub., varieties of; *id. ibid.* *B. crispicollis* noticed; *id. t. c.* p. 165.

Xanthochelus nomas, Pall. (= *firmus*, Gyll., = *montivagus*, Chev. ?, = *eversmanni*, Faust); *X. eversmanni*, Fähr. (= *nomas*, Faust, = *firmus*, Faust): *id. t. c.* p. 166.

Lixus (sub *Bothynoderes*) *soricinus*, Mars. (= *Cleonus sycophanta*, Fairm.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 88. *L. dubitalis*, Fairm., is probably the southern var. known as *wagneri* of the northern *L. ascanii*; *id. ibid.*

Larinus chevrolati, Boh. (= *L. interruptus*, Desb.); *id. ibid.*

Mecaspis obsoletus var. n. *sinuatus*, Turkestan; Faust, S. E. Z. xlvi. p. 165.

New species:—

Cleonus implicatus, Quango Riv., Faust, Ent. Nachr. xi. p. 90.

Leucosomus insignis, Algeria, p. 84, *quadratithorax*, Spain, p. 85, *L. ophthalmicus* var. *cœcus*, p. 86, Desb., Col. Nord Afr. ii.

Bothynoderes partitus, Turkestan, Faust, S. E. Z. xlvi. p. 164.

Pachycerus taciturnus, p. 166, *atrox*, p. 167, Turkestan, *id. t. c.*

Larinus lanuginosus, p. 168, *capiomonti*, p. 169, *contractus*, p. 170, Turkestan, *id. t. c.*; *L. interruptus*, Oran, Desb., Col. Nord. Afr. ii. p. 88.

Lixus professus, Algeria, *id.* B. E. Z. xxix. p. 239; *L. mucoreus*, Java, *vulpinus*, Sumatra, p. 222, *conformis*, New Guinea, p. 223, Pasc., Ann. Mus. Genov. (2) ii.

Hylobiides.

Leconte, Tr. Am. Ent. Soc. xii. pp. 29–32, notices the following:— *Pachylobius picivorus*, Germ. (= *Hylobius stupidus*, Boh.); *H. pales*, Hbst. (= *H. assimilis*); *Chalcodermus spinifer*, Boh., *Tachygonus tardipes*, Lec., *Toxotropis pusilla*, Lec.

Dryopais, g. n., for *D. variabilis*, New Zealand, sp. n., Broun, N. Z. J. Sci. ii. p. 387.

Eiratus suavis, New Zealand, sp. n., *id. ibid.*

Lepyrus nordenskiöldi, Tschuktscha-Penins., sp. n., Sahl., Veg. exp. Vet. iv. p. 34.

Hylobius rusticus, Sumatra, *crassirostris*, New Guinea, p. 224, *aclecoides*, Celebes, p. 225, spp. nn., Pasc., Ann. Mus. Genov. (2) ii.

Orthorhinus patruelis, p. 225, Somerset, *perversus*, *brachypus*, p. 226, New Guinea, spp. nn., *id. t. c.*

Erirhinides.

Eugnomides. Note on *Metacinops* and *Auchmeresthes*, and table of genera of this group; Faust, B. E. Z. xxix. pp. 118–120.

Mecinus pyraster, Hbst. Metamorphoses of, described; Budd., JB. nass. Ver. xxxviii. p. 86.

Bagous binodulus, Hbst. Larva described; Gad. de K., Bull. Soc. Rouen, 1884, p. 378.

New genera and species :—

Ctylindra, for *C. rhomboidea*, New Guinea, sp. n., Pasc., Ann. Mus. Genov. (2) ii. p. 227, pl. i. fig. 2.

Hexeria, near *Xeda*, for *H. concinna*, Celebes, *id. t. c.* p. 228.

Stenodema, p. 91, for *S. ferruginea*, Lake Nyassa, p. 92, sp. n., Faust, Ent. Nachr. xi.

Notaris imprudens, p. 170, *oberti*, p. 171, Turkestan, Faust, S. E. Z. xlvi.

Sharpia soluta, Turkestan, *id. t. c.* p. 171.

Geranorhinus virens, Turkestan, *id. t. c.* p. 177.

Hydronomus sinuatocollis, Turkestan, *id. t. c.* p. 178.

Smicronyx robustus, p. 175, *balassogloi*, p. 176, *præcox*, p. 177, Turkestan, *id. t. c.*

Aneuma compta, New Zealand, Broun, N. Z. J. Sci. ii. p. 387.

Mecinus erinaceus, Bedel, Faune Col. Seine, ii. p. 147, France.

Oxycorinides.

Metrioxena decisa, Ternate, sp. n., Pasc., Ann. Mus. Gen. (2) ii. p. 228.

Belides.

Belus divisus, Cape York, sp. n., *id. t. c.* p. 229.

Apionides.

Metamorphoses of *Apion scdi*, Germ., and *immune*, Kby., noticed; Budd., JB. nass. Ver. xxxviii. p. 90.

Apion perraudieri, N. Africa, Desb., Col. Nord Afr. iii. p. 89; *A. uniseriatum*, p. 185, *gemulum*, p. 186, *causticum*, p. 187, *merale*, *gelidum*, p. 188, *gaudiale*, p. 189, Faust, Deutsche e. Z. xxix.; *A. occultum*, Algeria, *id.* B. E. Z. xxix. p. 244; *A. albertisii*, Cape York, Pasc., Ann. Mus. Genov. (2) ii. p. 230; *A. parpanensis*,* Die Ins. Welt., No. 17, Dec. 1885, p. 100 [*cf.* Wien. ent. Z. v. p. 32] : spp. nn.

Attelabides.

Apoderus satelles, Sarawak, p. 230, *discoideus*, *picticornis*, Sumatra, *ferrarii*, *clavatus*, p. 231, Java, *doriæ*, Sumatra, p. 232, spp. nn., Pasc., Ann. Mus. Genov. (2) ii.

Rhinomacerides.

Rhynchites corvinus, Sumatra, *femoralis*, *beccarii*, Celebes, p. 233, *hirtellus*, Sumatra, p. 234, Pasc., Ann. Mus. Genov. (2) ii.; *R. semicyaneus*, Bed., Bull. Soc. Ent. Fr. (6) iv. p. cxl., Algeria: spp. nn.

Eugnamptus tenuicollis, Sumatra, sp. n., Pasc., *t. c.* p. 234.

Auletes picticornis, N. Guinea, *id. ibid.*; *A. akinini*, Turkestan, Faust, Deutsche e. Z. xxix. p. 161 : spp. nn.

Ectemnorhinides and *Erodiscides.*

Ectemnorhinus similis, *parvulus*, Marion Is., Waterh., Ann. N. H. (5) xvi. p. 122, spp. nn.

Erodiscus tinamus, Florida, sp. n., Lec., Tr. Am. Ent. Soc. xii. p. 31.

Magdalinides.

Magdalis. Table of the German species, and critical remarks on, Weise, Deutsche e. Z. xxix. pp. 410–416.

Magdalis egregia, Turkestan, Faust, S. E. Z. xlvi. p. 180; *M. grilati*, Algeria, Bed., Bull. Soc. Ent. Fr. (6) v. p. cii.: spp. nn.

Balaninides.

Balaninus tersus, New Guinea, sp. n., Pasc., Ann. Mus. Genov. (2) ii. p. 235.

Anthonomides.

Telphasia, g. n., p. 235, for *T. diluta*, sp. n., p. 236, Sumatra; Pasc., Ann. Mus. Genov. (2) ii.

Niseida, g. n., near *Acalyptus*, for *N. virginea*, sp. n., Aru; *id. t. c.* p. 236.

Imera, g. n., p. 236, near *Acalyptus*, for *I. pedestris*, sp. n., p. 237, Celebes; *id. t. c.*

Orchestes flavescens, Turkestan, Faust, S. E. Z. xlvi. p. 188; *O. biplagiatus*, p. 92, *flavipes*, p. 94, *habelmanni*, p. 95, Desb., Col. Nord. Afr. ii.; *O. betuleti*, N. America, Horn, Tr. Am. Ent. Soc ii. p. 161: spp. nn.

Toplithus or *Toplethus*? The spelling of this subgeneric name discussed at full length; Goz., Rev. d'Ent. iv. pp. 279 & 280.

Coryssomerides.

Coryssomerus scolopax, Algeria, sp. n., Faust, B. E. Z. xxix. p. 243.

Prionomerides.

Piazorhinus pictus, Lec. Amplified description; Canad. Ent. xvii. p. 105.

Synnada sylviella, sp. n., Celebes, Pasc., Ann. Mus. Genov. (2) ii. p. 237.

Tychiides.

Biology of *Tychius crassirostris*, Kirsch; Mik., Wien. ent. Z. iv. pp. 289–292, pl. iv.

Apeltarius multilineatus, Desbr., is probably a synonym of *Tychius amplicollis*, Aubé; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 89.

Sibynes (sub *Ceuthorhynchus*) *cupulifer*, Ch. Bris. (= *S. cretososparsus*, Fairm.), and will form the new genus *Dichotychius*, Bedel; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 88. *S. planiuscula*, Desbr.: the habitat is Algeria; *id. t. c.* p. 89.

Pachytychius kirschi, Tourn. (= *puncticollis*, Reitt.); Reitt., Wien. ent. Z. iv. p. 83. *P. granulicollis*, Tourn. (= *Aubeonymus granicollis*, Reitt.); *id. t. c.* p. 274. *P. leucoloma*, Jekel, was described from Senegal, not from Algeria, as given in the Munich Catalogue; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 88.

New genus and species :—

Eudela, p. 237, for *E. rufescens*, Sarawak, p. 238, sp. n.; Pasc., Ann. Mus. Genov. (2) ii.

Tychius biskrensis, Algeria, Faust, B. E. Z. xxix. p. 240; *T. gigas*,

retusus, p. 181, *kuschakewitschi*, p. 182, *bedeli*, p. 183, *conformis*, *urbanus*, p. 184, *mixtus*, *oschianus*, p. 185, *distans*, p. 186, Turkestan, *id.* S. E. Z. xlvi.

Miccotrogus chevrolati, Algeria, *id.* B. E. Z. xxix. p. 241.

Sibinia exigua, Algeria, *id. t. c.* p. 241 ; *S. subirrorata*, Turkestan, *id.* S. E. Z. xlvi. p. 186.

Pachytychius crassirostris, *planiusculus*, p. 174, *solidus*, p. 175, *id. t. c.*; *P.* (*Styphlotychius*) *avulsus*, Algeria, *id.* B. E. Z. xxix. p. 237.

Cionides.

Stereonychus. Synonymy of species ; see Wien. ent. Z. iv. p. 275.

Stereonychus fraxini, Deg. *Cionus phyllireæ*, Chev., is a variety of this, not a synonym of *S. gibbifrons*, Kies. ; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 88.

Corimalia, g. n., for *Nanophyes pallidus* and allies ; Goz., Rev. d'Ent. iv. p. 129.

Nanophyes pruinosus, Turkestan, sp. n., Faust, S. E. Z. xlvi. p. 188.

Cionus (*Platylæmus*) *perlatus*, Lake Nyassa, sp. n., *id.* Ent. Nachr. xi. p. 93.

Gymnetrides.

Gymnetron sim s, food plant of ; Rev. d'Ent. iv. p. 161.

Gymnetron apicale, Turkestan, Faust, S. E. Z. xlvi. p. 187 ; *G. sapiens*, Algeria, *id.* B. E. Z. xxxx. p. 242 : spp. nn.

Læmosaccides and *Alcidides.*

Læmosaccus insularis, Yule I., *petulans*, New Guinea, spp. nn., Pasc., Ann. Mus. Genov. (2) ii. p. 238.

Alcides profluens, New Guinea, p. 239, *detentus*, *decursus*, Java, *intrusus*, Borneo, p. 240, *rostratus*, New Guinea, *naso*, Borneo, p. 241, *gestroi*, New Guinea, pl. i. fig. 8, *zonatus*, fig. 10, p. 242, *geometricus*, fig. 9, Sumatra, *brevicollis*, fig. 7, *pusillus*, New Guinea, p. 243, *id. t. c.* ; *A. glanvillei*, Cape Colony, Pering., Tr. S. Af. Soc. iii. p. 143 : spp. nn.

Alcides trifidus, *crassus*, Pasc., figured ; Waterh., Aid, iii. pl. clxi. figs. 7 & 8.

Menemachides.

Acicnemis longirostris, New Guinea, *filigera*, Sumatra, p. 244, *laticollis*, *linea*, *gestroi*, New Guinea, p. 245, *doriæ*, Sarawak, *clypeifera*, Ansus, p. 246, *angustula*, Aru, *spilonota*, Yule I., *sororia*, Cape York, p. 247, spp. nn., Pasc., Ann. Mus. Genov. (2) ii.

Acicnemis variegata, Fairm., belongs to *Berethia* ; *id. t. c.* p. 244.

Cryptorhynchides.

Die Stridulationsapparat bei *Cryptorhynchus lapathi* ; Ent. Nachr. xi. p. 179.

Amphialus turgidus, Pasc., figured ; Waterh., Aid, iii. pl. clvii. fig. 8.

Psepholax coronatus and *tibialis* discussed, and validity of latter still queried ; Hudson, N. Z. J. Sci. ii. p. 515.

New genera and species :—

Polyzelus, allied to *Psepholax*, for *P. crassicollis*, sp. n., New Guinea, p. 248, pl. iii. fig. 7; Pasc., Ann. Mus. Genov. (2) ii.

Magaris, p. 249, near *Empleurus*, for *M. variabilis*, sp. n., New Guinea, p. 250, pl. ii. fig. 2 ; *id. t. c.*

Thisus (*Ithyporinæ*), for *T. biguttatus*, Sumatra, sp. n. ; *id. t. c.* p. 250.

Imathia, near *Melanterius*, but without pectoral canal, for *I. bella*, *unicolor*, New Guinea, spp. nn. ; *id. t. c.* p. 251.

Eurysia (*Ithyporinæ*), p. 251, for *E. fulvicornis*, sp. n., p. 252, Celebes ; *id. t. c.*

Dystropicus (*Sophroninæ*), for *D. squalidus*, sp. n., Yule I. ; *id. t. c.* p. 252.

Tadius (*Sophroninæ*), for *T. crirhinoides*, sp. n., Macassar ; *id. t. c.* p. 253.

Theoclia (*Sophroninæ*), for *T. bifasciata*, sp. n., Yule I. ; *id. ibid.* pl. iii. fig. 3.

Praodes (*Sophroninæ*), for *P. acalloides*, sp. n., Java ; *id. t. c.* p. 254.

Emydica, genus incertæ sedis, after *Camptorhini*, something like *Delocrania* in *Cassididæ*, for *E. platynota*, sp. n., pl. ii. fig. 1, Ansus ; *id. t. c.* p. 255.

Diathryptus, p. 255, near *Lembodes*, for *D. asper*, New Guinea, sp. n., p. 256 ; *id. t. c.*

Anchithyrus, near *Salcus*, for *A. obesus*, Yule I., p. 257, *gestroi*, New Guinea, p. 258, spp. nn. ; *id. t. c.*

Ptolycus, also near *Salcus*, for *P. trachypterus*, pl. ii. fig. 13, p. 258, *carinirostris*, *fuligineus*, p. 259, New Guinea, spp. nn. ; *id. t. c.*

Hybicus, near *Salcus*, for *H. rotundatus*, sp. n., Yule I. ; *id. t. c.* p. 260.

Chirogonia, related to *Deretiosus*, but with facies of an *Opatrum*, for *C. opatroides*, sp. n., New Guinea ; *id. t. c.* p. 260.

Aporonotus, near *Poropterus*, for *A. simplex*, sp. n., Yule I. ; *id. t. c.* p. 264.

Cleobis, near *Tragopus*, for *C. gemmatus*, sp. n., New Guinea ; *id. t. c.* p. 266.

Berosicus, near *Berosiris*, for *B. persona*, sp. n., pl. iii. fig. 10, New Guinea ; *id. t. c.* p. 269.

Eudyasmus, near *Cyamobolus*, for *E. albertisii*, sp. n., pl. ii. fig. 5, New Guinea ; *id. t. c.*

Hyparinus (*Cryptorhynchides vrais*), p. 275, for *H. dispar*, sp. n., p. 276, pl. ii. fig. 3, New Guinea ; *id. t. c.*

Amadus, near *Menios*, for *A. gestroi*, sp. n., New Guinea, &c. ; *id. t. c.* p. 278.

Chænosternum, resembling *Omias*, p. 181, for *C. konanum*, sp. n., p. 182, Oahu ; Blkn., Tr. R. Dublin Soc. (2) iii.

Hyperomorpha, near *Acalles*, Blkn., *t. c.*, for *H. squamosa*, sp. n., p. 183, Oahu ; *id. t. c.*

Ithyporus transversus, p. 237, Nossi-Bé, *gracilirostris*, p. 238, Madagascar, Fairm., Ann. Soc. Ent. Fr. (6) iv.

Arthrostenus fur, Turkestan, Faust, S. E. Z. xlvi. p. 179.

Orobitis nigrinus, Bosnia, Reitt., Deutsche e. Z. xxix. p. 213.

Mecistocerus quedenfeldti, Quango Riv., Faust, Ent. Nachr. xi. p. 94.

Perrhœbius deponens, Java, Pasc., Ann. Mus. Genov. (2) ii. p. 248

Melanterius aratus, Cape York, *id. t. c.* p. 249.

Camptorhinus doriæ, Borneo, &c., *id. t. c.* p. 254.

Salcus granulatus, Yule I., *id. t. c.* p. 256.

Acalles rugosus, p. 256, *doriæ*, p. 257, pl. ii. fig. 12, Cape York, *id. t. c.*; *A. brisouti*, Corfu, Reitt., Deutsche e. Z. xxix. p. 388; *A. costifer*, *sulcicollis*, Texas, Lec., Tr. Am. Ent. Soc. xii. p. 30; *A. lateralis*, *duplex*, p. 178, *angusticollis*, p. 179, Sharp, *mauiensis*, *ignotus*, *decoratus*, p. 180, Blkn., Hawaiian Arch., Tr. R. Dublin Soc. (2) iii.; *A. terricola*, New Zealand, Broun, N. Z. J. Sci. ii. p. 387.

Tychanus ventralis, New Zealand, *id. ibid.*

Sympedius lepidus, New Zealand, *id. ibid.*

Asytesta bivirgata, New Guinea, Pasc., Ann. Mus. Genov. (2) ii. p. 259.

Anaballus scabrosus, Yule I., *id. t. c.* p. 261.

Poropterus glanis, pl. ii. fig. 11, *gemmifer*, p. 261, New Guinea, *socius*, *echimys*, Yule I., *concretus*, *mitratus*, p. 262, *vicarius*, *pertinax*, New Guinea, *archaicus*, Aru, *sciureus*, Yule I., p. 263, *ordinarius*, New Guinea, p. 264, *id. t. c.*

Mormosintes nodosus, New Guinea, *id. t. c.* p. 265.

Eribaces ater, pl. ii. fig. 9, p. 265, *beccarii*, p. 266, New Guinea, *id. t. c.*

Berosiris calidis, New Guinea, &c., *tristis*, Yule I., p. 267, *incertus*, Aru, *irroratus*, *sparsus*, Java, *pauper*, Sumatra, p. 268, *id. t. c.*

Diatassa picta, New Guinea, *id. t. c.* p. 269.

Nechyrus indignus, Yule I., *restrictus*, Aru, p. 270, *decisus*, New Guinea, p. 271, *id. t. c.*

Syrichius rusticus, Yule I., *id. t. c.* p. 271.

Tyrtæosus concretus, p. 271, *pardalis*, *bicolor*, Cape York, *aversandus*, New Guinea, *discrepans*, Yule I., p. 272, *id. t. c.*

Gygæus prodigus, New Guinea, pl. ii. fig. 10, p. 273, *id. t. c.*

Cyamobolus mimicus, p. 273, *ludiosus*, *trivittatus*, pl. ii. fig. 7, *funereus*, p. 274, New Guinea, *id. t. c.*

Odosyllis ingens, pl. ii. fig. 8, p. 276, New Guinea, *gemmata*, Yule I., *crucigera*, New Guinea, Cape York, p. 277, *id. t. c.*

Chatectetorus histrio, p. 277, *gronopoides*, p. 278, Yule I., *id. t. c.*

Blepiarda simulator, New Guinea, p. 279, *id. t. c.*

Cryptorhynchus lutosus, Florida, *brachialis*, Texas, Lec., Tr. Am. Ent. Soc. xii. p. 31.

Pseudomus inflatus, Florida, *id. t. c.* p. 31.

Zygopides.

New genera and species :—

Pantiala, near *Semiathe*, for *P. illusa*, New Guinea, sp. n.; Pasc., Ann. Mus. Genov. (2) ii. p. 284.

Diomia, near *Thyestetha*, for *D. tetragramma*, New Guinea, sp. n.; *id. t. c.* p. 285.

Idogenia, near *Idotasia*, for *I. croccicornis*, Java, &c., sp. n. ; Pasc., *t. c.* p. 287.

Camia, p. 287, near *Semiathe*, for *C. superciliaris*, New Guinea, sp. n., p. 288 ; *id. t. c.*

Zygara, for *Asytesta doriæ*, Kirsch. (figured, pl. iii. fig. 2) ; *id. t. c.* p. 288.

Cœnochira, p. 289, systematic position rather doubtful, for *C. doriæ*, New Guinea, sp. n., p. 290, pl. iii. fig. 6 ; *id. t. c.*

Mecopus onca, New Guinea, *id. t. c.* p. 280.

Arachnopus patronus, New Guinea, *id. t. c.* p. 281.

Chirozetes marmoreus, New Guinea, *id. t. c.* p. 282.

Phylaitis confusa, New Guinea, *id. ibid.*

Osphilia affinis, Goram, *id. t. c.* p. 283.

Telaugia assimilis, New Guinea, *id. ibid.*

Idotasia honesta, Ternate, p. 285, *ampliata*, *rufipennis*, *pulicaris*, p. 286, *pulchella*, New Guinea, *oblonga*, Aru Is., p. 287, *id. t. c.*

Isorhynchides.

Lobotrachelus marginatus, Java, *exilis*, Cape York, spp. nn., *id. t. c.* p. 290.

Othippia guttula, Cape York, sp. n., *id. t. c.* p. 291.

Ceuthorhynchides.

Rhinoncus longulus, Lec., corrected description of ; Canad. Ent. xvii. p. 104.

Ceuthorhynchidius troglodytes, Fab. Metamorphoses described ; JB. nass. Ver. xxxviii. p. 88.

Ceuthorhynchus. In this genus are sunk by Bedel *Cœliodes*, *Rhytidosoma*, *Tapinotus*, *Poophagus*, and numerous other less generally accepted genera ; Faune Col. Seine, ii. p. 161.

Ceuthorhynchus volgensis, characters of ; Faust, S. E. Z. xlvi. p. 194.

New genus and species :—

Phrydiuchus, g. n., for *Rhinoncus topiarius*, with tabulation of the European genera allied to *Ceuthorhynchus* ; Goz., Rev. d'Ent. iv. p. 129.

Cœliodes frater, *dohrni*, p. 189, *venustus*, p. 190, *brisouti* (*Oxyonyx*), p. 192, *solskyi* (*Oxyonyx*), p. 193, Turkestan, Faust, S. E. Z. xlvi.

Phytobius taschkenticus, Turkestan, *id. t. c.* p. 194.

Ceuthorhynchus formosus, p. 195, *sulphureus*, *viator*, p. 196, *optabilis*, p. 197, *sordidus*, *biseriatus*, p. 198, (*C.?*) *transversus*, p. 199, Turkestan, *id. t. c.* ; *C. ilicis*, sp. n. (= *Cœliodes schonherri*, Bris. i. litt.), Bed., Faune Col. Seine, ii. p. 164 ; *C. symphyti*, n. n. (= *raphani*, auct., *nec* Fab.), *id. t. c.* p. 168.

Rhytidosomus dentipes, Carinthia, Reitt., Deutsche e. Z. xxix. p. 389.

Baridiides.

Baris. Under this genus must be united *Eumycterus*, Schön., and *Melaleucus*, Chev., the characters attributed to the latter being purely imaginary ; Bed., Faune Col. Seine, p. 183.

Orchis weevil (g. ?, sp. ?) figured and noticed ; Gard. Chron. (2) xxiii. pp. 633 & 635.

Trichobaris trinotatus, Say, destroying potatoes ; Riley, Rep. Ent. 1884, p. 411.

Baris t-album var. n. *sculpturatum*, Faust, S. E. Z. xlvi. p. 201.

New genera and species :—

Limnobaris, for *Baris t-album*, auct. ; Bed., Faune Seine, p. 183.

Oxynia, near *Myctides*, for *O. lineata*, Sumatra, sp. n. ; Pasc., Ann. Mus. Genov. (2) ii. p. 98, pl. iii. fig. 5.

Degis, near *Myctides*, for *D. trigonopterus*, New Guinea, sp. n. ; *id. t. c.* pl. iii. fig. 4.

Theogama, near *Pseudocholus*, for *T. lugubris*, Celebes, sp. n. ; *id. t. c.* p. 295, pl. iii. fig. 1.

Zena, near *Cynethia*, p. 295, for *Z. cynethioides*, Malay Is., sp. n. ; *id. t. c.* p. 296, pl. iii. fig. 11.

Plaxes, for *P. impar*, Borneo, &c., sp. n. ; *id. t. c.* p. 296.

Baris balassogloi, intercalaris, p. 200, *fimbriata*, p. 202, Turkestan, Faust, S. E. Z. xlvi. ; *B. leucospila*, p. 291, *fulvicornis, ebenina*, New Guinea, *mutica*, Celebes, p. 292, Pasc., Ann. Mus. Genov. (2) ii.

Myctides familiaris, Cape York, *nitidulus*, New Guinea, *æneus*, Sarawak, *id. t. c.* p. 293.

Pseudocholus querulus, Yule I., *id. t. c.* p. 297.

Calandrides.

[*Cf.* Chevrolat (73).]

Rhyncophorus ferrugineus, Ol. Varieties of ; MT. schw. ent. Ges. vii. p. 198.

Sphenophorus robustus, Horn, and *S. sculptilis*, Uhl., destroying corn ; Riley, Rep. Ent. 1884, p. 413. *S. meridionalis* (= *pumilus*, All., = *grandini*, Mars., = *sanguipennis*, Chev.) ; Bed., Faune Col. Seine, p. 191, note.

Rhodobænus tredecimpunctatus var. n. β *duodecimmaculatus*, var. n. γ *metropalitanus* [sic] ; *R. quinquepunctatus*, Say, var. n. β *thoracicus* ; *R. cinctus* varr. β, γ, δ *funerarius*, ε *obliquus*, varr. nn. : Chev., Ann. Soc. Ent. Fr. (6) v. p. 277 ; *R. implicatus*, Gyl., var. *variabilis*, Sch., described ; *id. t. c.* p. 279.

Phylleruthrus, subg. n., for the four species classed as *Sphenophorus* by the author, *op. cit. infrà*, 1882, p. 578, and *Sphenophorus aurofasciatus*, de Brême ; Chev., Ann. Soc. Ent. Fr. (6) iv. p. 92.

New genera and species :—

Phrynoides, to be placed before *Crepidotus*, Chev., Ann. Soc. Ent. Fr. (6) v. p. 94, for *P. luteus*, sp. n., Para ; *id. t. c.* p. 95.

Polyaulax, to be placed after *Liocalandra*, for *Sphenophorus castaneipennis*, Boh., Natal ; *id. t. c.* p. 95.

Meroplus (written *Meraphus*, but corrected on p. 292), p. 95, near *Sphenophorus*, for *M. serrirostris* (type), Celebes, *denticulatus*, p. 96, *alternans*, Amboyna, *cinereiventris*, Moluccas, p. 97, *nigrocinctus*, Philippines, *geniculatus*, Celebes, *lineanigra*, Java, p. 98, *hæmaticus*, Ceylon, *subscutellaris*, Cochin China, *flavolineatus*, Manilla, spp. nn., *id. t. c.*

Aplotes, near *Meroplus*, to include *Sphen. carinicollis*, Schön., *rælofsi*, Chev., *cruciger*, Motsch., and *A. alienus*, Java, *diversilineis*, Moluccas, spp. nn., Chev., Ann. Soc. Ent. Fr. (6) v. p. 100.

Homalostylus, after *Rhodobænus*, for *Sphenophorus latiscapus*, Kirsch ; *id. t. c.* p. 287.

Paradiaphorus, for *Sphenophorus crenatus*, Bilb. ; *id. t. c.*

Odoiporus, for *Calandra longicollis*, Oliv., which is from East India, not St. Domingo, and has for synonyms *Sphen. planipennis* and *glabricollis*, Gyll. ; *id. t. c.* p. 288.

Temnoschoita, for *Sphenophorus quadrimaculatus*, Gyll. (= *quadripustulatus*, Ol.) ; *id. t. c.* p. 289.

Cosmopolites, for *Calandra sordida*, Germ. ; *id. t. c.* p. 289.

Merothricus, p. 290, for *Sphenophorus rusticus*, Gyl., and *M. nigroscutellatus, campestris*, Cayenne, p. 291, spp. nn. ; *id. t. c.*

Anathymus, near *Megaproctus*, for *A. singularis*, sp. n., pl. iii. fig. 13, p. 299 ; Pasc., Ann. Mus. Genov. (2) ii.

Ganaë, for *G. pulchella*, pl. iii. fig. 9, Aru I., *amœna*, New Guinea, spp. nn., p. 307 ; *id. t. c.*

Nephius, near *Strombocerus* (placed in *Calandrinæ* probably by error), for *N. gestroi*, sp. n., Sumatra ; *id. t. c.* p. 308.

Rhynchophorus glabrirostris, Celebes, Schauf., Hor. Ent. Ross. xix. p. 203.

Cercidocerus trichopygus, Sylhet, Chev., Ann. Soc. Ent. Fr. (6) v. p. 91.

Trachorhopalon reflexus, Ceram, p. 102, *leucogrammus*, Ceylon, *humeralis*, China, *cincticauda*, Malacca, p. 103, *lineolatus, horsfieldi*, Java, *fissicauda*, Cambodia, p. 104, *inversicornis*, Ind. or ?, p. 105, *id. t. c.*

Sphenophorus sanguinipennis, Marseilles, p. 107, *geminatus*, Chili, Peru, *glabripes, sulcifrons*, Mexico, p. 110, *id. t. c.* ; *S. promissus*, New Guinea, p. 300, *atomarius*, Sumatra, *tincturatus*, Ternate, *beccarii*, Bura, p. 301, *doriæ*, Sarawak, *torridus*, Aru, Pasc., *t. c.* ; *S. interruptecostatus*, Celebes, Schauf., Hor. Ent. Ross. xix. p. 204 ; *S. morreni*, Ecuador (?), Rœl., Ann. Ent. Belg. xxix. p. 10.

Rhodobænus femoralis, p. 277, *auctus, hæmatidus, elegans*, p. 278, *deltoides, andreæ*, p. 279, *ypsilon, corniculatus*, Mexico, *centromaculatus*, Cayenne, p. 280, *miniatus* (Dej.), *nigricornis, crucicollis*, p. 281, *bipunctatus*, Brazil, *lebasi, bicinctus, lineiger*, Colombia, p. 282, *pinguis*, p. 283, *quinquemaculatus, alboscutellatus, varieguttatus*, p. 284, *nigrolineatus, suturellus, confusus*, p. 285, Mexico, Chev., Ann. Soc. Ent. Fr. (6) v.

Sphenocorynes melanaspis, Sumatra, &c., Pasc., Ann. Mus. Genov. (2) ii. p. 298.

Prodioctes amœnus, Sarawak, *id. t. c.* p. 300.

Barystethus tropicus (" is this *Dialtates dispar*, Chev., and is *Dialtates* a misprint for *Diathetes* ? "), New Guinea, *id. t. c.* p. 303.

Diathetes nigripennis, Ternate, p. 303, *imparatus, pictus*, New Guinea, p. 304, *id. t. c.*

Laogenia longicollis, Sumatra, *id. t. c.* p. 305.

Calandra punctigera, Celebes, &c., p. 305, *cribrosa, porcata*, Sumatra, *rugosula*, Ramoi, *fuliginosa*, New Guinea, p. 306, *id. t. c.* ; *C. remota*, Oahu, Sharp, Tr. R. Dublin Soc. (2) iii. p. 183, pl. v. fig. 29.

Strombocerides, Oxyrhynchides, and *Sipalides.*

Orthosinus sculpticollis, Motsch. (= *Xerodermus porcellus*, Lac.); Chev., Ann. Soc. Ent. Fr. (6) v. p. 112.

Cryptoderma, new name for *Oxyrhynchus*, Schön.; Rits., Notes Leyd. Mus. vii. p. 54.

Sipalus cristatus, Celebes, sp. n., Schauf., Hor. Ent. Ross. xix. p. 204.

Rhina affaber, Farh., ♂, ♀, = *ebriosa*; Chev., Ann. Soc. Ent. Fr. (6) v. p. 112.

Cossonides.

In this group, specially, Bedel, Faune Col. Seine, ii., introduces many generic and specific changes and rectifications.

Amaurorrhinus. The supposed distinct Mediterranean species are probably all one; Bedel, Bull. Soc. Ent. Fr. (6) v. p. cxxxix.

Wollastonia quercicola. Larva is lignivorous; Bull. Brooklyn Soc. vii. p. 150.

Cossonus planatus, n. n. for *C. linearis*, auct.; Bed., *t. c.* p. 195.

Phlœophagosoma. Rhyncolus tenuis, Gem., belongs to this; Sharp, Tr. R. Dublin Soc. (2) iii. p. 189.

Oodemas. Table of species of the genus, p. 185; *O. nivicola* figured, pl. v. fig. 35: Tr. R. Dublin Soc. (2) iii.

Pentarthrum prolixum, fig. 26, *Anotheorus montanus*, fig. 34, *Dryophthorus modestus*, fig. 30, figured; *t. c.*

Glœodema spatula figured (*ruficollis*, Woll., is its ♀, p. 315); Pasc., Ann. Mus. Genov. (2) ii. pl. iii. fig. 8.

New genera and species:—

Codiosoma; type, *Curc. spadix*, Hbst.: Bed., Faune Seine, p. 194.

Dolichotelus, appears to connect *Cossonidæ* and *Scolytidæ*; Blkn., Tr. R. Dublin Soc. (2) iii. p. 190, for *D. apicalis*, sp. n., p. 191.

Heteramphus, p. 187, for *H. wollastoni*, pl. v. fig. 31, and *foveatus*, p. 188, *cylindricus*, fig. 32, and *hirtellus*, p. 189, spp. nn., Hawaiian Arch., Sharp, Tr. R. Dublin Soc. (2) iii.

Pseudolus, g. n., for *Rhyncolus longulus*, Boh. (the species figured, pl. v. fig. 33); *id. t. c.* p. 190.

Tetraspartus, near *Dryophthorus*, for *T. bagoides*, sp. n., Java; Pasc., Ann. Mus. Genov. (2) ii. p. 309.

Elatticus, next *Chœrorhinus*, for *E. beccarii*, sp. n., New Guinea; *id. t. c.* p. 310.

Dexipeus, near *Synommatus*, for *D. famosus*, Java, *costatus*, Sumatra, p. 311; *id. t. c.*

Allœotes, near *Synommatus*, for *A. griseus*, Amboina, sp. n.; *id. t. c.* p. 312.

Anius, near *Coptorhamphus*, p. 312, for *A. pauperatus*, sp. n., p. 313, Sarawak; *id. t. c.*

Ochronanus, p. 313, near *Pholidonotus*, for *O. pygmæus*, Java, p. 314, sp. n.; *id. t. c.*

Tarchius, near *Phlœophagus*, for *T. pinguis*, Mt. Singalang, sp. n.; *id. t. c.* p. 314.

Psilotrogus, near *Cossonus*, for *P. extensus*, New Guinea, sp. n.; Pasc., *t. c.* p. 318.

Rhypax, for *R. obscurus*, Borneo, &c., sp. n.; *id. t. c.* p. 323.

Synommatus lineatus, p. 310, *interruptus*, p. 311, Java, *id. t. c.*

Stenotrupis exilis, Aru, *id. t. c.* p. 313.

Homalotrogus arctatus, Cape York, *id. t. c.* p. 315.

Cossonus anxius, p. 315, *macer*, New Guinea, *indigens*, *excavatus*, p. 316, *albertisi*, Cape York, *incisus*, Celebes, *basalis*, p. 317, *thoracicus*, p. 318, New Guinea, *id. t. c.*

Isotrogus bilineatus, Cape York, *id. t. c.* p. 318.

Heterophasis fulvipennis, *erro*, Java, *id. t. c.* p. 319.

Stereoborus inductus, Cape York, *id. t. c.* p. 320.

Stereoderus longipennis, New Guinea, p. 320, *teres*, Ternate, p. 321, *id. t. c.*

Oxydema naso, New Guinea, *elongata*, Singalang, p. 321, *id. t. c.*

Orthotemnus disparilis, Cape York, *id. t. c.* p. 322.

Xenotrupis congruens, Tawau Is., *id. t. c.*

Pachyops pusilla, Java, *id. t. c.* p. 323.

Phænomerus (genus incertæ sedis) *lineatus*, New Guinea, *id. t. c.* p. 324.

Oodemas tardum, *æquale*, *crassicorne*, Hawaiian Arch., Blkn., Tr. R. Dublin Soc. (2) iii. p. 184.

Scolytidæ.

Fauvel, —. Supplément aux *Xylophages* d'Europe. Rev. d'Ent. iv. pp. 326–329.

Comprises additional localities, and table of *Tomicus acuminatus* and allies.

Glyptoderes, *Hypothenemus* (*Stephanoderes*), are at best only subgenera of *Cryphalus*, and *Liparthrum* of *Hypoborus*; Goz., Rev. d'Ent. iv. p. 278.

Scolytus pyri and *rugulosus*, Ratz., biology of; Budd., JB. nass. Ver. xxxviii. pp. 91–97: also of *Ernoporus fagi*, Nördl, p. 97, and *Xylocleptes bispinus*, Dft., p. 98; *id.*

Chapuisia, g. n., very aberrant, for *C. mexicana*, sp. n.; Dugès, Ann. Ent. Belg. xxix. 2, p. 58, pl. v., with description of metamorphoses.

Xyleborus obliquus, *truncatus*, p. 192, *insularis*, p. 193, Sharp, *rugatus*, p. 192, *immaturus*, *frigidus*, p. 193, Blkn., Hawaiian Arch., spp. nn., Tr. R. Dublin Soc. (2) iii.

Hypothenemus griseus, Oahu, sp. n., Blkn., *t. c.* p. 194.

Crypturgus gaunersdorferi, Eubœa, sp. n., Reitt., Deutsche e. Z. xxix. p. 390.

Brenthidæ.

Anisognathus augurius, Caffraria, sp. n., Kolbe, Ent. Nachr. xi. p. 187.

Amorphocephalus hospes, Zanzibar, sp. n., *id. t. c.* p. 188.

Miolispa bicanaliculata, *semivelata*, Celebes, *striata*, New South Wales, spp. nn., Schauf., Hor. Ent. Ross. xix. p. 206.

Orychodes femoratus, Celebes, sp. n., *id. ibid.*

ANTHOTRIBIDÆ.

Leconte notices variation of *Toxotropis pusilla*, and the occurrence in Florida and Texas of *Xenorchestes americanus*, Motsch.; Tr. Am. Ent. Soc. xii. p. 32.

Toxotropis fasciatus, Texas, sp. n., Lec., *t. c.*

Choragus vittatus, Russ. mer., Reitt., Wien. ent. Z. iv. p. 276; *C. nitens*, Massachusetts, Lec., *ibid.* : spp. nn.

Mauia, g. n., allied to *Ozotomerus*, Blkn., Tr. R. Dublin Soc. (2) iii. p. 194, for *M. satelles*, sp. n., Maui, *t. c.* p. 195.

BRUCHIDÆ.

Bruchus spinipes, Er. The correct habitat is probably Chili, not China; Ent. Nachr. xi. p. 285.

Caryoborus nucleorum, Fab.: larva, pupa, and perfect insect described and figured; found in fruits of *Orbignyia* (sp. n. near *O. humilis*, Mart.) brought from Paraguay: Lefevre & Poujade, Ann. Soc. Ent. Fr. (6) iv. pp. 243–248, pl. xi. *C. nucleorum* and its metamorphoses described and figured; Franch., Bull. Soc. Philom. (7) ix. p. 11, pl. i. *C. pallidus*, Ol.: Fairm. records its capture at Lisbon and Kustendjé; Bull. Soc. Ent. Fr. (6) v. p. lxv.

Mylabris gilvipes, Chev., (= *diffinis*, Ab.); Ab. de Perrin, Bull. Soc. Ent. Fr. (6) v. p. xxxix.

Sharp, Biol. Centr. Am. *Col.* v. pp. 437–492, rejects (p. 439) the reversal, proposed by Des Gozis and others, of the names *Mylabris* and *Bruchus*, and notices the following known forms of the family:—*Bruchus brasiliensis, longicollis, scutellaris, obsoletus, humeralis, impiger*, pl. xxvi. fig. 17; *Spermophagus*, of which *Zabrotes*, Horn, is a section, p. 492.

Pachymerus incapable of definition at present, and *Andromisus*, Des Goz., therefore to be placed as a synonym under *Bruchus*; Sharp, *t. c.* p. 439.

Bruchus longifrons, p. 440, pl. xxvi. fig. 1, Panama, *albotectus*, p. 441, Mexico to Panama, fig. 2, *cristicollis*, Mexico, p. 442, *serratissimus*, Guatemala, *juno*, Guatemala and Panama, p. 443, *godmani*, fig. 3, *calderensis*, Panama, *confinis*, Guatemala, Panama, p. 444, *incensus*, fig. 4, Panama, p. 445, *pictifemur*, Mexico, *salvini*, fig. 5, p. 446, *columbinus*, fig. 6, Guatemala, p. 447, *aberrans*, fig. 7, Panama, *mundulus*, Mexico, p. 448, *cordifer*, Guatemala, *celatus*, Panama, p. 449, *lituratus*, Panama, *suaveolus*, fig. 8, Nicaragua, Panama, p. 450, *ruficoxis*, Guatemala, Nicaragua, p. 451, *difficilis, argillaceus*, Guatemala, *argutus*, Mexico, Guatemala, p. 452, *vexatus, pertinax*, Mexico, p. 453, *ornatus*, p. 454, Mexico, *serenus*, Guatemala, *submuticus*, Mexico, p. 455, *limpidus, solitarius, elevatus*, Guatemala, p. 456, *crassulus*, Panama, *vacillator*, Mexico, p. 457, *puellus*, Panama, p. 458, *mexicanus*, Mexico, *ptinoides*, Guatemala, p. 459, *cyanipennis*, fig. 9, Guatemala, Panama, *serraticulus*, Mexico, p. 460, *modestus, multisignatus*, p. 461, *ophthalmicus, debilicornis*, p. 462, Guatemala, *obscuriceps*, Mexico, *brevicornis*, Brit. Honduras, p. 463, *muricatus*, Panama, *inanis*, Mexico, Brit. Honduras, p. 464, *guttifer*, Mexico, Guatemala, *alticola*, fig. 10 p. 465, *laminifer*, Guatemala, *instabilis*, Mexico to Honduras, p. 466,

morosus, Mexico, Guatemala, *usticolor*, Mexico, p. 467, *militaris*, Mexico, fig. 11, *obesulus*, Guatemala, p. 468, *trisignatus*, Panama, p. 469, *flaviventris*, Guatemala, *medialis*, Mexico, *interruptus*, Mexico, Guatemala, p. 470, *seclusus*, Panama, *monachus*, p. 471, *ægrotus*, *semicolon*, Guatemala, *cognatus*, Mexico, p. 472, *piger*, Mexico, Guatemala, p. 473, *immunis*, *viduatus*, Panama, p. 474, *sallæi*, Mexico, Guatemala, p. 475, *longiventris*, Arizona, Sonora, *insolitus*, p. 476, *lineaticollis*, fig. 12, Guatemala, *championi*, Panama, p. 477, *pullatus*, Mexico to Panama, p. 478, *stylifer*, Mexico, *pedicularius*, Guatemala, *pusillimus*, Mexico, Guatemala, p 479, *flavicornis*, Mexico, *brevipes*, fig. 14, p. 480, *infirmus*, *probus*, Guatemala, *æqualis*, Mexico, p. 481, *longulus*, fig. 15, *apicalis*, p. 482, *filarius*, *restrictus*, *optatus*, p. 483, *viduus*, Guatemala, *cubiciformis*, p. 484, fig. 16, *leucurus*, p. 485, Mexico, Guatemala, *callirhipis*, Nicaragua, *contaminatus*, Mexico, p. 486, *compactus*, fig. 18, p. 487, Guatemala, *leucosomus*, Mexico to Panama, p. 488, *leucospilus*, fig. 19, Mexico, *reticulatus*, p. 489, *excellens*, Panama, *porosus*, Guatemala, p. 490, spp. nn., Sharp, Biol. Centr. Am. *Col.* v.

Spermophagus pectoralis, Mexico to Panama, p. 492, *propinquus*, fig. 20, Guatemala, Panama, *gravidus*, Mexico, Guatemala, *dispar*, fig. 21, Panama, p. 494, *pollens*, Brit. Honduras, *obductus*, Panama, *obscurus*, Mexico to Panama, p. 495, *togatus*, Guatemala, p. 496, *spectabilis*, Panama, *leporinus*, *luctuosus*, Guatemala, Panama, p. 497, *perfectus*, Mexico, *trisignatus*, Mexico to Panama, p. 498, *geminatus*, Panama, *rufulus*, Guatemala, p. 499, *dytiscinus*, fig. 22, Guatemala, *scutellaris*, *centralis*, fig. 23, Guatemala to Panama, p. 500, *marmoratus*, fig. 24, Mexico, Panama, p. 501, *pictus*, Mexico, *irroratus*, fig. 25, Guatemala, Panama, p. 502, spp. nn., *id. t. c.*

Caryoborus chiriquensis, Panama, sp. n., p. 504, fig. 13, *id. t. c.*

Andromisus mariæ, Bordeaux, but imported from America, sp. n., Goz., Rev. d'Ent. iv. p. 125.

Zabrotes, g. n., p. 156 (= *Spermophagus*, pars, *cf.* Sharp, Biol. Centr. Am. *Col.* v. p. 492), for *Z. cruciger*, *spectabilis*, p. 157, *obliteratus*, *subnitens*, *densus*, *planifrons*, p. 158, spp. nn., N. America, Horn, Tr. Am. Ent. Soc. xii.

Trictenotomidæ.

Trictenotoma templetoni, West., is valid species; Dohrn, S. E. Z. xlvi. p. 145.

Cerambycidæ.

[*Cf.* Bates (124), Pascoe (241), Horn (150), Leng (188).]

Hibernation of Longicorns discussed; Rev. d'Ent. iv. p. 35.

Prionides.

Hypocephalus armatus. Outline fig. of the two sexes; Le Nat. vii. p. 126.

Psalidognathus modestus, Fries., and *mygaloides*, Thoms., not one; the latter name to be suppressed, and *thomsoni*, Lam. (n. n.), used; Lam., C.R. ent. Belg. vii. p. ix.

Meroscelisus apicalis, White, and allies : note on ; *id. t. c.* p. x.
Eurynassa odewahni, Pasc. ♀ described ; *id. ibid.*
Dioclides prionoides, Thoms. Note on ; *id. t. c.* p. xi.

Dugès, Eug. Métamorphoses du *Mallodon angustatum*, Thoms. Ann. Ent. Belg. xxviii. pp. 13–17, pl. ii.

Lameere, A. Contributions à l'histoire des métamorphoses des *Longicornes* de la famille des *Prionidæ*. Mém. Liège, xi. (Mém. 11, pp. 16, pl., sep. pag.). [Includes a list of the known larvæ of *Prionidæ*.]

Psalidognathus modestus, Fries. : larva described ; Lam., *t. c.* pp. 7 & 8.
Macrotoma palmata ?, Fab. : larva described ; *id. t. c.* p. 9.
Parandra polita, Say : larva described ; *id. t. c.* p. 11.
Mallodon melanopus, L., dwarfing oaks ; Riley, Rep. Ent. 1884, p. 410.
Calloctenus pulcher, remarks on ; Lam., Ann. Ent. Belg. xxviii. p. 106.

New species :—

Parandra villei, Ecuador, Lam., C.R. ent. Belg. 1885, p. xi.
Polyarthron bienerti, Persia, Heyden, Deutsche e. Z. xxix. p. 311, pl. iv. fig. 1 ; *P. komaroffi*, Merv, Dohrn, S. E. Z. xlvi. p. 64.
Prionus (*Psilotarsus*) *balassogloi*, p. 91, *brevispinus*, p. 92, Turkestan, Jak., Bull. Mosc. xli.
Cacosceles crassicornis, Zambesi, Pering., Tr. S. Af. Soc. iii. p. 145, pl. iv. figs. 3 & 4 ; accompanied by figs of *C. œdipus*, ♂ fig. 2 ; ♀ fig. 3.
Xixuthrus costatus, Solomon Is., Waterh., Ann. N. H. (5) xv. p. 383.
Macrotoma octocostata, Africa, Qued., J. Sci. Lisb. xl. p. 240.
Ægosoma (*Megopis*) *lacordairei*, Mauritius, Lam., C.R. ent. Belg. 1885, p. xii.
Pyrodes candezei, Ecuador, *id. ibid.*
Solenoptera parandroides, Cuba, *id. t. c.* p. xiii.

Cerambycides.

Faculty of hearing in *Cerambyx* ; Will., Z. wiss. Zool. xlii. p. 680.
Thoris eburifera, *Phoracantha hospita*, *Tryphocaria mastersii*, Pasc., *Demelius semirugosus*, Waterh., figured ; Waterh., Aid. iii. pl. clxi. figs. 1, 2, 3, & 6.
Ganglbauer, Verh. z.-b. Wien, xxxv. pp. 516 & 517, comments on the following palæarctic Cerambycids, viz., *Leptura montana*, Muls., with var. n., *Strangalia approximans*, Rosh., *Grammoptera ruficornis*, F., *Callidium lineare*, Hampe.
Molorchus bimaculatus, Say, var. (= *Glaphyra semiusta*, Newm.) ; *Leptura sphæricollis*, Say (= *allecta*, Newm.) ; *L. vibex*, Newm. (= *nitidicollis*, Horn) ; Horn, Am. Ent. i. pp. 8 & 9.
Coccoderus novempunctatus, Germ. Characters of ♂ ♀ ; Lameere, Ann. Ent. Belg. xxviii. p. 85.
Elaphidion villosum, Fab. Note on habits ; Canad. Ent. xvii. p. 188.
Peribœum. Bates considers it doubtful whether this and *Stigocera*, Serv., are distinct or not. The species previously recorded by him, Biol. Centr. Am. v. p. 27, under the generic name of *Nephalius*, should be referred to *Peribœum*. Bates, *t. c.* p. 254.
Sotenus setiger, Shp., figured ; Tr. R. Dublin Soc. (2) iii. pl. v. fig. 49.

Toxotus schaumii, Lec., variation of; Canad. Ent. xvii. p. 103.

Toxotinus (sub *Toxotus*) *reini*, Heyd., = (*longicornis*, Bates); Heyd., Deutsche e. Z. xxix. p. 310.

Leptura vibex var. described; Canad. Ent. xvii. p. 104. *L. maculicornis*: characters of this and allies; Rey, Rev. d'Ent. iv. pp. 275–277: nouvelle note, *ibid.* pp. 324–326.

Strangalia verticalis var. n. *adaliæ*, Adalia; Reitt., Deutsche e. Z. xxix. p. 391.

Clytus. This name should be reserved for the *arietis*, not the *arcuatus* group; Goz., Rev. d'Ent. iv. p. 279.

Clytus acutus (= *exsanguis*, Chev.); *C. proximus* (= *multiguttatus*, Burm., = *elongatus*, Chev.); and *C. famelicus*, Burm., is a valid species, not a var. of *C. elongatus*: Berg., Bull. Soc. Ent. Fr. (6) v. p. cv.

Cyllene erythropus, Chev. Metamorphoses; Dugès, Ann. Ent. Belg. xxix. 2, pp. 40–44, pl. iii. figs. 1–12.

Plagithmysus (= *Clytarlus*, Shp.). Note on errors relating to; Shp., C.R. ent. Belg. 1885, p. lxxiv. [*cf.* Horn, Tr. Am. Ent. Soc. xii. p. 197].

Clytarlus microgaster, fig. 46, *blackburni*, fig. 47, *fragilis*, fig. 48, figured; Shp., Tr. R. Dublin Soc. (2) iii.

Glycobius speciosus, Say, ravages of; Riley, Rep. Ent. 1884, p. 382.

Eurycephalus maxillosus is not ♂ of *lundii*, Fab., but a distinct species, of which *E. variabilis*, Pasc., is ♀; Rits., Notes Leyd. Mus. vii. p. 128.

Purpuricenus kæhleri (= *globulicollis*, Muls.); Goz., Rev. d'Ent. iv. p. 279.

Philagathes, Thoms. To this genus refer *Eurycephalus wieneckii*, Voll., and *Purpuricenus sanguinolentus*, Ol.; Rits., Notes Leyd. Mus. vii. p. 128.

Oxoplus marginatus and *corallinus*, note on; Lec., Tr. Am. Ent. Soc. xii. p. 23.

Tylosis maculata and *sellata* are one species; Horn, Tr. Am. Ent. Soc. xii. p. 176.

Crossidius, great variation in, noticed; *id. ibid.*

Bates, Biol. Centr. Am. *Col.* v. pp. 249–332, specially notices or figures the following previously known forms:—*Hypermallus inermis*, *Trichophorus decipiens*, pl. xvii. fig. 7, *Psyrassa castanea*, pl. xvii. fig. 8, *Gnomidolon*, *Ibidion textile* (= *mexicanum*), with varr. *alacre* and *sericans*, *obtusum* with var. *segregatum*, *vanum*, pl. xviii. fig. 20, *Phormesium virgulatum*, *Obrium cordicolle*, pl. xix. fig. 9; *Distenia fimbriata*, fig. 13, *fastuosa*, *lineatopora*, pl. xvii. fig. 12, *vittata*, fig. 10, *Cometes acutipennis*, *Leptura aliena*, *Acmæops longicornis*, *Ophistomis lævicollis*, *Merioneda culicina*, pl. xx. fig. 18, *Odontocera fasciata*, *Acyphoderes olivieri*, pl. xx. fig. 21, *Phespia corinna*, fig. 25, *Tomopterus vespoides*; *Callichroma plicata*, Bates, *ante*, p. 45, is not Leconte's species, but a variety of *sapphira*; *C. melancholica*, *purpurata*, *aureotincta*; *Cyllene crinicornis* and allies tabulated, p. 294; *C. mexicana*; *Ochresthes obliquus*, pl. xxi. fig. 2, *sommeri*, *circuliferus*, *citrinus*, *viridiventris*, pl. xxi. fig. 5; *Clytus dimidiaticornis*; *Mecometopus ion*; *Neoclytus distortus*; *Tilloclytus balteatus*,

hæmatocephalus; *Oleozona pulchra* and var. *rufipes*; *Rhopalophora cupricollis, miniatocollis, tenuis*; *Stenosphenus sobrius*; *Agalissus quadrimaculatus* is a var. of *melaniodes*, *A. clytoides* (= *A. gratus* = *Aplectrus lepturoides*, Chev.), p. 314; *Stenygra histrio*; *Elytroleptus*, Dugès, p. 317, *E. octocostatus*; *Crioprosopus*, *C. iridescens*, *C. basileus*, corrected description, p. 320, *tricolor*; *Stenaspis verticalis, solitarius*; *Dettaspis nigripennis*; *Muscidora tricolor*, Th.; *Tyloses jimenezi*; *Crossidius trivittatus*; *Ischnocnemis costipennis*; *Sphenotheca tomentosus, trilineatus*; *Entomosterna sanguiniventris*; *Pleuromenus baccifer, semicostatus*; *Trachyderes subfasciatus, elegans* var. n. *eximius*; *Lissonotus multifasciatus*.

New genera :—

Caccophrissus, Bates, Biol. Centr. Am. v. p. 252, near *Stromatium*, for *C. pauper*, sp. n., Mexico, p. 252, pl. xviii. fig. 8.

Sphærionillum, allied to *Sphærion*, *id.* p. 256, for *S. pictum*, *ibid.*, *quadrisignatum*, p. 257, pl. xvii. fig. 21, Mexico, spp. nn.

Ectenessa, position doubtful, perhaps most allied to *Peribœum*, *id.* p. 257, for *E. nitida*, p. 258, pl. xviii. fig. 3, Mexico, Nicaragua, *subopaca*, *phthisica*, *sexmaculata*, p. 257, Brazil, spp. nn., and ? *Ibidion anormale*, Thoms.

Coscinedes, next *Hemilissa*, *id.* p. 258, for *C. gracilis*, sp. n., p. 259, pl. xix. fig. 4.

Choriolaus, to follow *Ophistomis*, *id.* p. 283, for *C. ægrotus*, *ibid.*, *nanus*, pl. xx. fig. 8, *latescens*, fig. 9, p. 284, Mexico, spp. nn.

Tilloclytus, for *Tillomorpha*, Chev., *nec* Blanchd., *id.* p. 303, and *T. clavipes*, sp. n., Guatemala, p. 304, pl. xxi. fig. 11.

Pempteurys, near *Diphyrama*, *id.* p. 304, for *P. sericans*, sp. n., Guatemala, *ibid.* pl. xxi. fig. 12.

Aphysotes, to follow *Diphyrama*, for *A. tubericollis*, p. 308, pl. xxi. fig. 16, Panama, sp. n.; *id. t. c.*

Eucharassus, near *Lissozodus*, *id.* p. 308, for *E. dispar*, Panama, p. 309, pl. xxi. fig. 18, sp. n.; *id. t. c.*

Zenochloris, next *Chrysoprasis*, *id.* p. 311, for *Z. paradoza*, Panama, sp. n., p. 312, pl. xxi. fig. 19.

Corynellus, allied to *Pteroplatus*, *id.* p. 318, for *C. mimulus*, Mexico, and *ochraceus*, pl. xxi. fig. 20, Panama, p. 319, spp. nn.

Scythroleus, allied to *Tragidion*, *id.* p. 324, for *S. picticornis*, Mexico, sp. n., *ibid.*

Hægea, to follow *Tylosis*, *id.* p. 326, for *H. distigma*, p. 327, pl. xxi. fig. 25, Mexico, sp. n.

Sotira (*Hesperophanides* ?), for *S. flexuosa*, Amboyna, sp. n.; Pasc., Ann. N. H. (5) xv. p. 54.

Volxemia, near *Erosida*, p. 85, for *V. dianella*, p. 86, Brazil, sp. n.; Lam., Ann. Ent. Belg. xxviii.

Hypexilis, near *Exilia*, for *H. pallida*, Texas, sp. n.; Horn, Tr. Am. Ent. Soc. xii. p. 173.

Pseudomyrmecion, near *Gravilia*, for *P. ramalium*, Algeria, sp. n.; Bedel, Bull. Soc. Ent. Fr. (6) v. p. cxxxii.

Micrometopus, near *Mastodolera*, for *M. punctipennis*, Angola, sp. n.; Qued., J. Sci. Lisb. xl. p. 241.

Cymaterus, near *Erythrus*, for *C. torridus*, N. Borneo, sp. n.; Pasc., Ann. N. H. (5) xv. p. 55.

New species in Biologia Centrali-Americana :—

Tetropium opacipenne, auripilis, p. 435, Mexico, Bates, Biol. Centr. Am. *Col.* v.

Hypermallus grisescens, Mexico, Guatemala, p. 249, *eximius*, pl. xvii. fig. 19, *longissimus*, fig. 4, Mexico, *subseriatus*, Panama, *lanuginosus*, pl. xviii. fig. 4, Guatemala, p. 250, *glabriusculus*, Panama, *misellus*, Guatemala, p. 251, *id. t. c.*

Trichophorus jansoni, Nicaragua, *id. t. c.* p. 252.

Peribœum cribricolle, p. 253, pl. xviii. fig. 9, *recticolle*, p. 254, fig. 6, Mexico, *id. t. c.*

Psyrassa sallæi, pl. xviii. fig. 11, *tympanophora*, fig. 12, p. 255, Mexico, *id. t. c.*

Ironeus mutatus, p. 255, pl. xviii. fig. 10, Mexico, *id. t. c.*

Eurysthea cribripennis, p. 256, pl. xviii. fig. 5, Panama, S. America, *id. t. c.*

Octoplon candidum, p. 261, Panama, *id. t. c.*

Piezocera monochroa, Mexico, Guatemala, *id. t. c.* p. 258.

Hemilissa flavicauda, p. 258, pl. xviii. fig. 7, Guatemala, *id. t. c.*

Hexoplon calligramma, p. 259, pl. xviii. fig. 13, Mexico, *id. t. c.*

Gnomidolon latabile, pl. xix. fig. 1, *insulicola*, fig. 2, Panama, *id. t. c.* p. 260.

Ibidion pleurostictum, pl. xviii. fig. 15, *leucozona*, fig. 16, *validicorne*, fig. 17, Panama, p. 261, *integripenne*, fig. 14, *latecittatum*, fig. 18, Mexico, *bilineatum*, fig. 19, Guatemala, p. 262, *tenuatum*, pl. xvii. fig. 25, p. 263, Mexico, *ventricosum*, p. 264, pl. xviii. fig. 22, *ignobile*, fig. 24, *hippopsoides*, fig. 25, Guatemala, *semirufum*, p. 265, *tenuissimum*, pl. xvii. fig. 24, *asperulum*, pl. xviii. fig. 21, Mexico, *chiriquinum*, Panama, p. 266, *id. t. c.*

Heterachthes æneolus, Mexico, p. 267, pl. xviii. fig. 23, *id. t. c.*

Curius panamensis, Panamá, p. 268, pl. xix. fig. 3, *id. t. c.*

Obrium lituratum, Guatemala, p. 268, pl. xix. fig. 6, *angulosum*, fig. 7, *piperitum*, fig. 12, p. 269, *clerulum*, fig. 5, Panama, *arciferum*, Guatemala, fig. 11, *cruciferum*, fig. 10, *ruficolle*, Mexico, p. 270, *cribripenne*, Guatemala, with var. from Mexico, p. 271, fig. 8, *id. t. c.*

Distenia högei, Mexico, pl. xix. figs. 6 & 7, Mexico, *falvopicta*, pl. xvii. fig. 11, p. 271, *agriloides*, Guatemala, *cribristernis*, pl. xix. fig. 20, *rugiscapis*, fig. 15, p. 272, *spinosa*, fig. 18, p. 273, Panama, *sallæi*, pl. xvii. fig. 13, *limbata*, pl. xix. fig. 14, *fuscula*, fig. 19, p. 273, Mexico, *simplex*, *punctiventris*, Panama, *brevicornis*, Mexico, pl. xvii. fig. 18, p. 274, *pictipes*, Guatemala, pl. xix. fig. 21, *langurioides*, fig. 22, Mexico, p. 275, *id. t. c.*

Cometes eximius, p. 275, *hilaris*, pl. xix. fig. 25, *festivus*, fig. 24, *venustus*, fig. 23, Panama, p. 276, *id. t. c.*

Pachyta costaricensis, p. 277, pl. xx. fig. 1, *id. t. c.*

Gaurotes maculosus, p. 277, Mexico, *id. t. c.*

Leptura anomala, p. 279, pl. xx. fig. 2, Guatemala, *id. t. c.*

Ophistomis pubipennis, Mexico, Guatemala, p. 279, *lachrymans*, pl. xx. fig. 4, *melampus*, Guatemala, *brachialis*, *sallæi*, Mexico, p. 281, *histrio*, Guatemala, fig. 3, *saltator*, fig. 6, p. 281, *felix*, fig. 5, p. 282, Panama, *pectoralis*, *xantho*, p. 282, *hirsutus*, Mexico, *fulvcolus*, fig. 7, Guatemala, p. 283, Bates, *t. c.*

Eurygptera costulata, p. 284, *chihuahuæ*, *mimula*, Mexico, *sericea*, p. 285, *fulvella*, pl. xx. fig. 12, *princeps*, fig. 11, Panama, *patricia*, fig. 14, *longipennis*, fig. 13, Mexico, p. 286, *id. t. c.*

Merionœda gratiosa, p. 287, pl. xx. figs. 16 & 17, Mexico, *id. t. c.*

Oxylymna championi, p. 288, pl. xx. fig. 10, Guatemala, *cæruleocincta*, p. 436, pl. xxv. fig. 25, Panama, *id. t. c.*

Ommata cyanea, Mexico, *iodes*, Panama, p. 288, *sallæi*, Mexico, p. 289, pl. xx. fig. 15, *id. t. c.*

Odontocera fuscicornis, Mexico, *apicula*, pl. xx. fig. 24, Panama, p. 289, *id. t. c.*

Acyphoderes velutinus, Guatemala, pl. xx. fig. 19, *suavis*, Mexico, fig. 20, p. 290, *id. t. c.*

Amphionthe brevicollis, Mexico, p. 291, pl. xx. fig. 23, *id. t. c.*

Callichroma novella, Nicaragua, *buprestoides*, Mexico, p. 293, *id. t. c.*

Cyllene panamensis, Bugaba, p. 295, *id. t. c.*

Ochresthes umbratilis, Guatemala, p. 297, pl. xxi. fig. 3, *sigmoides*, Mexico, fig. 4, *zebratus*, fig. 1, *litura*, p. 298, Guatemala, *id. t. c.*

Clytanthus ochrozona, Guatemala, p. 299, pl. xxi. fig. 6, *id. t. c.*

Mecometopus remipes, pl. xxi. fig. 7, *solidicornis*, Panama, *melanion*, Mexico, p. 300, *id. t. c.*

Neoclytus beltianus (= *lebasi*, *t. c.* p. 58, *nec* Chev.), p. 301, pl. xxi. fig. 10, Nicaragua, *championi*, fig. 8, Guatemala, *purus*, fig. 9, Mexico, Guatemala, p. 302, *id. t. c.*

Euderces lævicauda, *cribratus*, p. 304, *acutipennis*, p. 305, pl. xxi. fig. 15, Guatemala, *id. t. c.*

Apilocera högei, Mexico, *magna*, pl. xxi. fig. 13, p. 305, *sculpticollis*, *reticulata*, Guatemala, *cleriformis*, *cribellata*, Panama, p. 306, *rubella*, Guatemala, p. 307, pl. xxi. fig. 14, *id. t. c.*

Dihammophora hispida, Mexico, p. 308, *id. t. c.*

Rhopalophora nigriventris, Guatemala, p. 310, *id. t. c.*

Cosmisoma reticulatum, Mexico, p. 311, *id. t. c.*

Stenosphenus erythroderus, Mexico, *lineatus*, *languriodes*, Guatemala, p. 313, *id. t. c.*

Ancylocera cribicollis, Mexico, p. 314, *id. t. c.*

Callopisma cribellum, Panama, p. 315, pl. xxi. fig. 21, *id. t. c.*

Championa ctenostomoides, Mexico, p. 315, pl. xxi. fig. 17, *id. t. c.*

Platyarthron semicittatum, Panama, pl. xxi. fig. 22, *laterale*, Nicaragua, p. 316, *id. t. c.*

Elytroleptus longipennis, *eros*, pl. xxi. fig. 23, *nigripennis*, Mexico, p. 318, *id. t. c.*

Crioprosopus cacicus, Columbia, p. 319, *championi* (= *iridescens* ♀, Bates, *nec* White, *t. c.* p. 74), Guatemala, *divisus*, Mexico, p. 320, *C. lampros* (= *tricolor*, Bates, *t. c.* p. 75, *nec* Waterh.), p. 321, Panama, *id. t. c.*

Deltaspis alutacea, rubens, mœsta, virens, Mexico, p. 323, Bates, *t. c.*

Tragidion bicolor, p. 324, Mexico, *id. t. c.*

Tylosis puncticollis (= *T. maculata*, Bates, *t. c.* p. 81, *nec* Lec.), *T. angusticollis* (= *T. sellata*, Bates, *t. c.* p. 81, *nec* Lec.), p. 325, *T. suturalis*, p. 326, Mexico, *id. t. c.*

Mannophorus forreri, p. 327, pl. xxi. fig. 24, Mexico, *id. t. c.*

Ischnocnemis sexualis, cærulescens, Mexico, p. 328, *id. t. c.*

Sphenothecus luteicollis, Mexico, p. 329, *id. t. c.*

Ægoidus calligrammus, Panama, p. 331, *id. t. c.*

Trachyderes spinicollis, p. 332, Tres Marias Is., Mexico, *id. t. c.*

Other new species :—

Hammatocharus pactor, Paraguay, Lam., C.R. ent. Belg. 1885, p. lxi.

Dymasius vitreus, N. Borneo, Pasc., Ann. N. H. (5) xv. p. 53.

Xoanodera amœna, Ceylon, *id. ibid.*

Stromatium signiferum, Ceylon, p. 55, *id. t. c.*

Eburodacrys sexguttata (Dej.), *fortunata*, South Brazil, Lam., Ann. Ent. Belg. xxviii. p. 87.

Aneflus calcatus, Arizona, Leng, Ent. Am. i. p. 132.

Romaleum seminitidum, Arizona, *id. t. c.* p. 130.

Cordylomera zambeziana, Zambesi, Pering., Tr. S. Af. Soc. iii. p. 146.

Gnomidolon elegantulum, South Brazil, Lam., Ann. Ent. Belg. xxviii. p. 88.

Ibidion borrei, South Brazil, *id. ibid.* ; *I. alienum*, in copal from Madagascar, Qued., B. E. Z. xxix. p. 365.

Heterachthes submaculatus (= *Compsa id.*, Chev., Mun. Cat. p. 2831), sp. n., Antigua, Guadeloupe, Lam., Ann. Ent. Belg. xxviii. p. 100.

Ceresium coronarium, Bouru, p. 53, *rotundicolle*, Ceylon, p. 54, Pasc., Ann. N. H. (5) xv. p. 54.

Gracilia obliquata, Texas, Horn, Tr. Am. Ent. Soc. xii. p. 174.

Leptura sicula, Sicily, Gangl., Verh. z.-b. Wien, xxxv. p. 515 ; *L. picticornis*, Crete, Reitt., Deutsche e. Z. xxix. p. 390.

Alosterna talyschensis, Lenkoran, sp. n., *chrysomeloides* var. n. *subvittata*, Caucasus, *id. t. c.* p. 391.

Charis eupheme, South Brazil, Lam., Ann. Ent. Belg. xxviii. p. 89.

Coloborhombus fasciatipennis, Borneo, Waterh., Tr. E. Soc. 1885, p. 369, pl. x. fig. 12.

Zonopterus suspectus, Java, Rits., Notes Leyd. Mus. vii. p. 125, pl. iv. fig. 5.

Callichroma purpuratum (Chev.), Venezuela, Lam., Ann. Ent. Belg. xxviii. p. 106.

Closteromerus violaceipennis, annulatus, Angola, Qued., J. Sci. Lisb. xl. p. 242.

Callidium (*Liodercs*) *türki*, Taurus, Gangl., Verh. z.-b. Wien, xxxv. p. 517.

Callidium simplarium, Turkestan, Heyd., Deutsche e. Z. xxix. p. 296.

Callidium (*Semanotus*?) *cupreo-virens*, Angola, Qued., J. Sci. Lisb. xl. p. 242.

Phymatodes ater, New York, Lec., Tr. Am. Ent. Soc. xii. p. 22.

Cleroclytus collaris, Kuldja, Jak., Hor. Ent. Ross. xix. p. 290.

Clytus (*Xylotrechus*) *namaganensis*, Turkestan, Heyd., Deutsche e. Z. xxix. p. 297.

Clytella olesteroides, Andaman Is., Pasc., Ann. N. H. (5) xv. p. 56.

Clytarlus blackburnii, p. 195, and *filipes*, p. 196, Hawaii, Sharp, Tr. R. Dublin Soc. (2) iii.

Artimpaza formosa, N. Borneo, p. 55, *bicolor*, Andaman Is., p. 56, Pasc., Ann. N. H. (5) xv.

Rhopalophora lansbergei, Venezuela, Lam., Ann. Ent. Belg. xxviii. p. 107.

Chrysophrasis suturalis (Chev.), p. 107, *dutreuxi*, Venezuela, *chevrolati*, Colombia, p. 108, *id. t. c.*

Stenosphenus novatus, p. 178, Lower California, *lepidus*, *dolosus*, *debilis*, p. 179, N. America, Horn, Tr. Am. Ent. Soc. xii.

Pteroplatus divisus, Texas, *rufipennis*, p. 23, *apicalis*, *ignitus*, p. 24, Arizona, Lec., Tr. Am. Ent. Soc. xii.

Crioprosopus lateralis, Texas, *id. t. c.* p. 22.

Purpuricenus dimidiatus, California, *id. t. c.* p. 23.

Mataleptus batesi, Arizona, Horn, Tr. Am. Ent. Soc. xii. p. 174.

Oxoplus jocosus, sp. n. (with tabulation of the other N. American species), N. America, Horn, Tr. Am. Ent. Soc. xii. p. 175.

Distenia pryeri, N. Borneo, Pasc., Ann. N. H. (5) xv. p. 57.

Hornius, g. n., p. 61, of doubtful position, facies *Tetraopes* and *Astathes*, but the conformation of eyes, legs, and prosternum bring it near *Leptarides* and *Dorcasomides*, to either of which it has little resemblance; for *H. sulcifrons*, sp. n., p. 62, Orange Bay: Fairm., Ann. Soc. Ent. Fr. (6) v.

Lamiides.

Sympheletes torquatus, fig. 1, *Rhytiphora argus*, fig. 2, *Agnia eximia*, fig. 3, *Cereopsius tricinctus*, fig. 4, *Penthea scenica*, fig. 5, *Xynenon larvatus*, fig. 6, Pasc., pl. cliv., *Tmesisternus lotor*, Pasc., fig. 3, *Rhytiphora dallasii*, Pasc., fig. 4, *Dioristus albolateralis*, Waterh., fig. 5, pl. clvii., are figured by Waterhouse, Aid, iii.

Ganglbauer, Verh. z.-b. Wien, xxxv. pp. 518-523, comments on the following *Lamiides*, viz., *Dorcadion simile*, Kr., *haleppense*, Kr., *destinoi*, Fair., *insulare*, Kr., and *Phytœcia rittipennis*, Reiche; for the last sp. a new subgenus, *Obercina*, is proposed.

Parmena pubescens. To this should be referred as varieties, *algirica*, Cast., *inclusa*, Muls., *hirsuta*, Küst., *pilosa*, Brullé; Nouv. et faits, No. 49, p. 194.

Monilema. A monographic revision of the N. American species of this difficult genus, calling attention to some unobserved characters, is given by Horn, Tr. Am. Ent. Soc. xii. pp. 180-190.

Note on *Dorcadion faliginator*, with tabulation of the allied species; Rey, Rev. d'Ent. iv. pp. 235-238.

Dorcadion exornatum (= *inclusum*, Ferr.); Nouv. et faits, No. 49, p. 194.

Monohammus. The N. American species and their characters revised; Horn, Tr. Am. Ent. Soc. xii. pp. 190, &c.

Monohammus confusor, Kirb. Ravages, habits, larva, &c.; Riley, Rep. Ent. 1884, pp. 379–381, pls. v. fig. 3, vi. fig. 1, & vii. fig. 1.

Goes and *Dorcaschema*. Species of, tabulated by Horn, Tr. Am. Ent. Soc. xii. pp. 193 & 194.

In a memoir entitled "Aanteekeningen op Snellen van Vollenhoven's opstel 'Les Batocérides du Musée de Leide,'" Tijdschr. Ent. xxviii. pp. 101–107, Ritsema notices 28 species of *Batocérides*, correcting errors and giving additional information.

Apriona tigris, Thoms., and *punctatissima*, Kaup, are distinct species; Rits., Notes. Leyd Mus. vii. p. 128.

Micracantha nutans, Shp., figured; Tr. R. Dublin Soc. (2) iii. pl. v. fig. 50.

Belodera genei, Arr. (= *obliquetruncata*, Rosh., = *foudrasi*, Muls.); Nouv. et faits, No. 49, p. 194.

Eupogonius. Table of N. American species; Horn, Tr. Am. Ent. Soc. xii. p. 196.

Pogonocherus ovatus, Fourc. (= *ovalis*, Gmel., = *scutellaris*, Muls., = *multipunctatus*, Georg.; *P. fasciculatus*, De G. (= *hispidus*, L.): Nouv. et faits, No. 49, p. 194.

Hypsioma albisparsa, Germ. (= *H. bonaeriensis*, Burm.); Lam., Ann. Ent. Belg. xxviii. p. 93.

Spalacopsis stolata and *suffusa*, Newm., are probably sexes of one species; Horn, Ent. Am. i. p. 9.

Acanthoderes borrei (sp. n.). Metamorphoses; Dugès, Ann. Ent. Belg. xxix. (2) pp. 45–50, pl. iii. figs. 13–27.

Liopus femoratus, ♀ (= *constellatus*, Muls.); Nouv. et faits, No. 49, p. 194.

Astynomus carinulatus, Gebl. (= *sibiricus*, Motsch.), and *A. xanthoneurus*, Muls. (= *edmondi*, Fairm.); Nouv. et faits, No. 49, p. 194.

Oxylia duponcheli (= *languida*, Men., = *vestita*, Waltl, = *argentata*, Men.); Nouv. et faits, No. 50, p. 198.

Saperda scalaris, L. (= *maculosa*, Fald.); *S. 16-punctata*, Motsch. (= *carinata*, Bless.): Nouv. et faits, No. 50, p. 198. *S. scalaris* belongs to *Saperda*, not to *Argalia*; Goz., Rev. d'Ent. iv. p. 279. *S. calcarata*, Say: ravages noticed; Riley, Rep. Ent. 1884, p. 383.

Agapanthia irrorata, F.: of this *granulosa*, *nicæensis*, Chev., *pubiventris*, Muls., are varieties. *A. annularis*, Muls. (= *reyi*, Muls.); *A. asphodeli*, Lat. (= *insularis*, Gaut.); *A. dahli*, Richt. (= *cardui*, F., = *lineatocollis*, Muls., = *gyllenhalli*, Gangl.); *A. cynaræ*, Germ. (= *decora*, Kryn.), and *acutipennis*, Muls., *pyrenæa*, Bris., are varr.; *A. maculicornis*, Gyl. (= *trivittata*, Gebl.); *A. cardui*, L. (= *suturalis*, Muls.), *peragalloi*, Muls., and *consobrina*, Chev., being varr.; *A. chalybea*, Fald. (= *osmanlis*, Reiche). Nouv. et faits, No. 49, p. 195.

Phytœcia millefolii, Ad. (= *excelsa*, Stier.); *P. humeralis*, Waltl (= *insignis*, Chev.); *P. flavescens*, Br. (= *fumigata*, Kust., = *orbicollis*, Reiche); *P. beberi*, Gangl. (= *flavipes*, Gyll.); *P. alboscutellata*, Chev., and *jezabel*, Reiche, are varr. of *wachanrui*, Muls.; *P. rufimana*, Schr. (= *flavimana*, Panz.), *P. baccueti*, Br., being a var.; *P. geniculata*,

Muls. (= *fuscicornis*, Muls., = *orientalis*, Kr.) ; *P. cylindrica*, L. (= *simplonica*, Stier.); *P. nigricornis*, F. (= *obscura*, Bris.) ; *P. malachitica*, Luc., ♂ (= *bolivari*, Per.) : Nouv. et faits, No. 50, p. 195.

Mallosia mirabilis, Fald. (= *kotschyi*, Hampe) ; Nouv. et faits, No. 50, p. 198.

Isomerida fimbriata, Bates. ♀ of ; Lam., Ann. Soc. Belg. xxviii. p. 99.

Bates, Biol. Centr. Am. *Col.* v. pp. 334–435, notices or figures the following:—*Phrynidius echinus*; *Moncilema albopictum* and *variolare*; *Ptychodes trilineatus* ; *Tæniotes xanthosticus* var. *zunilensis* ; *Deliathis nivea* var. *detersa* ; *Parmenonta minor* ; *Adetus muticus* ; *Pteriehthya pisciformis* ; *Ptericoptus caudalis, panamensis* ; *Bisaltes buquetii*?, p. 346 ; *Ataxia crypta* ; *Aletretia* ; *Eupogonius longipilis* ; *Estola*, p. 355 ; *Tessarecphora arachnoides* ; *Plerodia degenera* ; *Oncideres tessellata* ; *Spalacopsis variegata* ; *Oreodera inscripta, fasciculosa*, Th. (= *hispida*, Bates, *t. c.* p. 135) ; *Œthomerus asperulus* ; *Steirastoma histrionica*, of which *S. larva* is a var., *cænosa*, pl. xxiii. fig. 6, *senex* ; *Acanthoderes lugens, sylvanus*; *Lagochirus binumeratus, rogersi*; *Leptostylus cineraceus, hispidulus, gibbulosus, lævicauda* var. n. *chiriquinus, obliquatus, incertus* ; *Eleothinus*, p. 392 ; *Leiopus*, p. 393 ; *Alcidion privatum* ; *Lophopeum saronotum*, amended description, p. 395 ; *Anisopodus pusillus*, with var. *nigrisparsus, pardalis* ; *Lepturges multinotatus, laticollis, L. tigrellus* var. *megaspilus* ; *Oxathres pictulus*, *t. c.* p. 174, does not belong to that genus, but must be placed in *Nyssodrys*, near *N. calligramma* ; *Œdopeza incerta*, *t. c.* p. 176, should rather be placed in *Leptostylus* ; *Nyssodrys*, p. 411, this as previously limited is not tenable, and *N. guttula* and *vitticollis* should be transferred to *Sporetus* ; *Nyssodrys contempta, caudata* var. n. *ocellata*, p. 413, *polyspila, decemguttata, pictula*, p. 416, *venusta*; *Carterica optata, pygmæa* ; *Colobothea ramosa*; *Drycothea sallæi, stictica* var. n. *lepidiota*, p. 422 ; *Callia minuta* (*t. c.* p. 195) to be transferred to *Asemolea*, p. 423 ; *Callia* divided into two groups — *Callia* proper, p. 423, and *Mimolaia*, p. 424 ; *C. lampyroides* to be removed to *Zenicomus*, and *C. auricollis* to *Hastatis* ; *Phœa phthisica* ; *Cirrhicera sallæi* var. n. *panamensis*, p. 429, *C. championi* ; *Amphionycha druryi* is not sufficiently distinct from *spectabilis*, p. 429 ; *Hemilophus prolixus* ; *Tyrinthia* [illegible]*he*.

New genera :—

Mecynome, to precede *Moncilema*, Bates, Biol. Centr. Am. *Col.* v. p. 335, for *M. æneseens*, *ibid.* pl. xxii. fig. 5, Guatemala, sp. n.

Euteleuta, near *Atimura*, *id. t. c.* p. 348, for *E. laticauda*, p. 349, pl. xxii. fig. 9, Panama, *fimbriata*, S. Brazil, *ibid.* note, spp. nn.

Acestrilla, to follow *Asyngenes*, *id. t. c.* p. 350, for *A. minima*, *ibid.* pl. xxii. fig. 12, Guatemala, Panama, sp. n.

Diliolophus, to be placed in *Apodasyides*, Lac., *id. t. c.* p. 355, for *D. vexator*, *ibid.* pl. xxii. fig. 17, Guatemala, sp. n.

Allæoscelis, placed before *Poliænus*, *id. t. c.* p. 358, for *A. leptis*, *ibid.*, Panama, sp. n.

Sarillus, allied to *Poliænus*, *id. t. c.* p. 359, for *S. pygmæus*, *ibid.* pl. xxii. fig. 19, Panama, sp. n.

Ecteneolus, near *Colobura*, Bates, *t. c.* for *E. flohri*, p. 360, Mexico, sp. n.

Pogonillus, near *Rhopaloscelis*, *id. t. c.* p. 360, for *P. inermis*, Mexico, *subfasciatus*, pl. xxii. fig. 20, Guatemala, *ibid.*, spp. nn.

Eurycallinus, next *Phacellus*, *id. t. c.* p. 362, for *E. mirabilis*, Mexico, p. 363, pl. xxii. fig. 22, sp. n.

Myrmolamia, *id. t. c.* p. 363, doubtfully distinct from *Cyrtinus*, Lec., for *M. opacicollis*, Guatemala, pl. xxii. fig. 23, and *penicillata*, Panama, p. 364, spp. nn.

Lamiessa, anomalous, but] probably near *Saperda*, *id. t. c.* p. 364, for *L. eumolpoides*, Guatemala, p. 365, pl. xxii. fig. 24, sp. n.

Xenofrea, allied to *Eumimetes*, *id. t. c.* p. 373, for *X. anomala*, Panama, *trigonalis*, Peru, *zonata*, Amazons, p. 373, *areolata*, Panama, p. 374, pl. xxiii. fig. 2, spp. nn.

Sychnomerus, very near *Acanthoderes*, *id. t. c.* p. 380, for *S. hirticornis*, pl. xxiii. fig. 11, *barbiger*, fig. 12, Guatemala, p. 381, spp. nn.

Amblysaphes, near *Acanthoderes*, *id. t. c.* p. 381, for *A. striatus*, Guatemala, p. 382, pl. xxiii. fig. 13, sp. n.

Xenostylus, to follow *Alcidion*, *id. t. c.* p. 394, for *X. sublineatus*, Panama, p. 395, pl. xxiv. fig. 5, sp. n.

Eutrichillus, near *Ozineus*, *id. t. c.* p. 397, for *Eleothinus comus*.

Eucharitolus, to follow *Lepturges*, *id. t. c.* p. 408, for *E. pulcher*, Panama, sp. n., *ibid.*

Sphenopsilus, near *Oxathres*, *id. t. c.* p. 409, for *S. claviger*, sp. n., *ibid.* pl. xxv. fig. 1, Panama.

Carpheolus, near *Chætanes*, *id. t. c.* p. 410, for *C. sublineatus*, sp. n., *ibid.* pl. xxv. fig. 2, Panama.

Bactriola, near *Sepiscuthis*, *id. t. c.* p. 421, for *B. vittulata*, Panama, S. America, *ibid.* pl. xxv. fig. 12, *paupercula*, Panama, p. 422, spp. nn.

Ærenicopsis, near *Ærenica*, *id. t. c.* p. 427, for *Æ. championi*, p. 428, pl. xxv. fig. 15, Panama, sp. n.

Sybropis, near *Sybra*, for *S. frontalis*, sp. n., N. Borneo, Pasc., Ann. N. H. (5) xv. p. 52.

Stethoperma (*Onocephalinarum*), p. 94, for *S. batesi*, *candezei*, spp. nn., Brazil, p. 94, Lam., Ann. Ent. Belg. xxviii.

New species in Biologia Centrali-Americana :—

Phrynidius asper, p. 334, Guatemala, Bates, Biol. Centr. Am. *Col.* v.

Parmena villosa, p. 335, Mexico, *id. t. c.*

Moneilema ebeninum, Mexico, p. 336, *id. t. c.*

Ptychodes candidus, Panama, p. 337, *id. t. c.*

Hammoderus granulosus, pl. xxii. fig. 1, *laceratus*, fig. 4, p. 339, *ornator*, Mexico, p. 340, fig. 2, *sargi*, fig. 3, Guatemala, *id. t. c.*

Parmenonta fulvosticta, Mexico, p. 341, *id. t. c.*

Adetus consors, Guatemala to Rio Janeiro, p. 342, *curtulus*, *mucoreus*, Panama, *postilenatus*, p. 343, Guatemala, *bacillarius*, pl. xxii. fig. 6, Guatemala, Panama, *nitens*, fig. 7, Panama, p. 344, *id. t. c.*

Pterichthya obliqua, Mexico, p. 345, *id. t. c.*

Pterocoptus fuscus, Mexico, *id. ibid.*

Parysatis nivisparsa, fulvifrons, pl. xxii. fig. 8, Panama, p. 346, *illita*, Guatemala, p. 347, Bates, *t. c.*

Esthlogena guatemalena, mirandilla, Guatemala, p. 348, *id. t. c.*

Amphicnæia quinquevittata, p. 349, pl. xxii. fig. 10, Guatemala, Panama, *i l. t. c.*

Aletretia pulchra, p. 350, pl. xxii. fig. 11, Panama, *id. t. c.*

Desmiphora scapularis, farinosa, pl. xxii. fig. 13, Panama, p. 351, *id. t. c.*

Atelodesmis piperita, p. 352, Mexico, *id t. c.*

Eupogonius apicicornis, Guatemala, Panama, pl. xxii. fig. 14, *scutellaris*, Panama, p. 352, *subnudus, vittipennis*, fig. 15, *lætus*, Guatemala, *major*, Mexico, Guatemala, p. 353, *comus*, Mexico, p. 354, *id. t. c.*

Vnelcus lineatus, p. 354, pl. xxii. fig. 16, Mexico, Guatemala, *id. t. c.*

Estola fulvitarsis, prolongata, Panama, p. 356, *leucosticta*, Mexico, *misella*, Honduras to Panama, p. 357, *id. t. c.*

Eupromera glabricula, p. 358, pl. xxii. fig. 18, Panama, *id. t. c.*

Poliœnus hircinus, p. 358, Mexico, *id. t. c.*

Penessada fuliginea, albosignata, pl. xxii. fig. 21, Guatemala, p. 361, *asperata*, Mexico, p. 362, *id. t. c.*

Hypsioma corniculata, Nicaragua, Panama, p. 365, *id. t. c.*

Glyphithaga paupera, Mexico, Brit. Honduras, p. 366, *id. t. c.*

Oncideres senilis, Mexico, Nicaragua, *ocellaris*, Guatemala, *rhodosticta*, Mexico, p. 367, *id. t. c.*

Taricanus minor, Mexico, p. 368, *id. t. c.*

Periergates chiriquensis, Panama, p. 368, *badeni*, Mexico ?, p. 369, *id. t. c.*

Ischioloncha lineata, p. 369, pl. xxii. fig. 25, Guatemala, Costa Rica, *id. t. c.*

Cacosiola rugicollis, Mexico, p. 370, *id. t. c.*

Spalacopsis phantasma, Guatemala, p. 371, *id. t. c.*

Dorcasta longipennis, Guatemala, Panama, p. 371, *mexicana, obtusa*, pl. xxiii. fig. 1, Mexico, Guatemala, p. 372, *id. t. c.*

Thryallis granulosus, Guatemala, p. 374, pl. xxiii. fig. 3, *id. t. c.*

Chalastinus championi, Panama, p. 374, pl. xxiii. fig. 4, *id. t. c.*

Oreodera graphiptera, Panama, p. 376, *id. t. c.*

Steirastoma liturata, Guatemala, p. 378, pl. xxiii. fig. 5, *id. t. c.*

Acanthoderes purulensis, pl. xxiii. fig. 7, *umbratus*, fig. 9, Guatemala, *polystictus*, fig. 8, Panama, p. 379, *arietis*, p. 380, fig. 10, Guatemala, *id. t. c.*

Tetrasarus formosus, Costa Rica, pl. xxiii. fig. 14, *plato*, Guatemala ?, fig. 15, p. 382, *id. t. c.*

Plagiosarus literatus, p. 382, *melampus*, p. 383, pl. xxiii. fig. 16, Guatemala, with var. *congestus*, fig. 17, Panama, *id. t. c.*

Lagochirus integer, Mexico, Guatemala, p. 384, *id. t. c.*

Leptostylus albescens, pl. xxiii. fig. 18, *retrorsus*, fig. 20, Panama, *diffusus*, fig. 19, Mexico, Guatemala, *signaticauda*, fig. 21, Honduras, Guatemala, p. 387, *fuligineus*, fig. 22, Guatemala, *phrissominus*, fig. 23, *zonatus*, fig. 24, Panama, *albicinctus*, fig. 25, Mexico, p. 388, *x-griseus*, pl. xxiv. fig. 1, *ochropygus*, Guatemala, *quintalbus*, fig. 2, *petulans*, Panama, p. 389, *angulicollis*, Guatemala, *dubitans*, Mexico, p. 390, *aspicicus*, Mexico, p. 391, pl. xxiv. fig. 3, *id. t. c.*

Alphinellus carinipennis, Mexico, p. 391, Bates, *t. c.*

Eleothinus (?) *pygmæus*, Guatemala, Panama, p. 394, pl. xxiv. fig. 4, *id. t. c.*

Læiopus naviicornis, Mexico, p. 393, *id. t. c.*

Lophopæum w-flavum, p. 395, pl. xxiv. fig. 6, *spinipenne*, p. 396, fig. 7, Panama, *id. t. c.*

Leptocometes curvatus, Mexico, p. 396, *id. t. c.*

Ozineus cribripennis, p. 396, *angulistigma*, pl. xxiv. fig. 8, *mœstus*, fig. 9, p. 397, Panama, *id. t. c.*

Anisopodus dispar, pl. xxiv. figs. 10 & 11, *nigripes*, fig. 12, Panama, *degener*, Mexico, p. 399, *id. t. c.*

Lepturges pallidulus, Guatemala, p. 400, pl. xxiv. fig. 13, *callinus*, fig. 14, Guatemala, *charicles*, *lateguttatus*, fig. 15, p. 402, *ornatissimus*, fig. 16, *charillus*, fig. 17, Panama, *callizonus*, fig. 18, p. 403, Guatemala, *euprepes*, Mexico, *histrionellus*, fig. 19, *trivittatus*, fig. 20, *pluristrigosus*, fig. 21, p. 304, Panama, *literatus*, fig. 22, Mexico, *abstersus*, Brit. Honduras, *nigridorsis*, fig. 23, Guatemala, *physoderus*, Guatemala, Panama, p. 405, *xantho*, fig. 24, *rufulus*, fig. 26, Guatemala, *amplicollis*, fig. 25, Panama, p. 406, *mundulus*, p. 407, Mexico, *id. t. c.*

Atrypanius irrorellus, *id. t. c.* p. 411, Guatemala, Panama.

Nyssodrys infima, *exilis*, p. 412, *porifera*, p. 413, pl. xxv. fig. 3, *inclusa*, p. 414, fig. 4, *vigintiguttata*, fig. 5, *unicittis*, fig. 6, *polytænia*, fig. 7, p. 415, *sulphurescens*, p. 416, *concinna*, p. 417, fig. 8, Panama, *buckleyi*, p. 416, Bolivia, *id. t. c.*

Astynomus eucharis, Panama, p. 418, pl. xxv. fig. 9, *id. t. c.*

Colobothea aleata, Nicaragua, Panama, p. 420, pl. xxv. fig. 10, *id. t. c.*

Carneades championi, Panama, p. 420, pl. xxv. fig. 11, *id. t. c.*

Tapeina (?) *nudicornis*, Mexico, p. 421, *id. t. c.*

Drycothea spreta, Mexico, p. 422, *parva*, *curtula*, Panama, p. 423, *id. t. c.*

Asemolea purpuricollis, Panama, p. 423, pl. xxv. fig. 13, *id. t. c.*

Callia albicornis, pl. xxv. fig. 14, *calopteroma*, Panama, *ambigua*, Mexico, *C.* (*Mimolaia*) *buckleyi*, Bolivia, p. 424, *id. t. c.*

Phœa rosea, *auricapilla*, Panama, p. 425, *id. t. c.*

Tetrops validicornis, Mexico, p. 426, *id. t. c.*

Pannychis atripennis, Mexico, p. 427, *id. t. c.*

Erana fuliginella, Guatemala, p. 428, *id. t. c.*

Amphionycha sericipennis, pl. xxv. fig. 16, *chionides*, fig. 17, *bicarinata*, fig. 18, p. 430, *ocreata*, Panama, *pulchricollis*, fig. 19, Guatemala, p. 431, *id. t. c.*

Alampyris cretaria, Mexico, p. 431, *A.* (?) *subcarinata*, Panama, p. 432, *id. t. c.*

Isomerida cinctiventris (on pl. xxv. fig. 20, *Amphionycha cinctipennis*), p. 432, *explanata*, p. 433, fig. 21, Panama, *id. t. c.*

Tyrinthia biformis, p. 433, pl. xxv. fig. 22, *photurina*, p. 434, fig. 23, Panama, *id. t. c.*

Lycidola unicolor, *isabellina*, pl. xxv. fig. 24, p. 434, *exima*, p. 435, Panama, *id. t. c.*

Clytra subg. *Otiqs* :—

Tmesisternus rafaelæ, Celebes, Lansb., C.R. ent. Belg. 1835, p. xxi.

Monilema spoliatum, S. California, p. 186, *ulkei*, Texas, p. 188, Horn, Tr. Am. Ent. Soc. xii.

Dorcadion emgei, Peloponnesus, p. 519, *eugeniæ*, Arcadia, p. 521, Gangl., Verh. z.-b. Wien, xxxv.

Morimus rufipectus, Africa, Qued., J. Sci. Lisb. xl. p. 243.

Pelargoderus semitigrinus, Sumatra, Rits., Notes Leyd. Mus. vii. p. 43, pl. iii. fig. 3.

Cereopsius arbiter, p. 50, *spilotus*, p. 51, Labuan, *satelles*, Sarawak, p. 51, Pasc., Ann. N. H. (5) xv.

Mesosa incongrua, N. Borneo, *id. t. c.* p. 52.

Agelasta polyspila, Naas I. [*sic*], *id. t. c.* p. 50.

Baræus tuberculatus, Angola, Qued., J. Sci. Lisb. xl. p. 244.

Prosopocera angolensis, Angola, *id. ibid.*

Zographus alboguttatus, E. Africa, Fairm., C.R. ent. Belg. 1885, p. ix.

Tragocephala bradshawi, Zambesi, Pering, Tr. S. Af. Soc. iii. p. 147.

Tragiscoschema apicalis, Zambesi, p. 148, pl. iv. fig. 6, *id. t. c.*

Pheryneta semirasa, Zambesi, Dohrn, S. E. Z. xlvi. p. 140; *P. ornata*, Angola, Qued., J. Sci. Lisb. xl. p. 245.

Dysphaga bicolor, Texas, Horn, Tr. Am. Ent. Soc. xii. p. 196.

Diallus guttatus, Batchian, Pasc., Ann. N. H. (5) xv. p. 51.

Crossotus (*Eumimetes*) *floccifer*, Cabinda (Africa), Qued., J. Sci. Lisb. xl. p. 245.

Sthenias lunulatus, N. Borneo, Pasc., Ann. N. H. (5) xv. p. 52.

Apomecyna latefasciata, p. 245, *quadrisignata*, *brevis*, p. 246, Angola, Qued., J. Sci. Lisb. xl.

Phoryctus paulinoi, Angola, *id. t. c.* p. 246.

Lypsimena californica, Horn, Tr. Am. Ent. Soc. xii. p. 194.

Oncideres texana, Texas, *id. t. c.* p. 195.

Tetraglenes diuroides, Sumatra, Rits., Notes Leyd. Mus. vii. p. 44, pl. iii. fig. 4.

Acanthoderes borrei, Mexico, Dugès, Ann. Ent. Belg. xxix. (2) p. 47, pl. iii. fig. 28.

Acanthoderes (*Pteridotelus*) *hematopus*, p. 109, *nigricans* (Dej.) (*Psapharochrus*), p. 110, Venezuela, Lam., Ann. Ent. Belg. xxviii.

Lophopæum timbouvæ, S. Brazil, *id. t. c.* p. 102; *L. volxemi*, S. Brazil, *id. t. c.* p. 95.

Liopus centralis, Arizona, Lec., Tr. Am. Ent. Soc. xii. p. 24.

Nyssodrys ophthalmica, Venezuela, Lam., Ann. Ent. Belg. xxviii. p. 110.

Hyperplatys fulvicolus, S. Brazil, *id. t. c.* p. 96.

Eutrypanus nigrosignatus (Dej.). S. Brazil, *id. t. c.* p. 97.

Colobothea signatipennis (Dej.), S. Brazil, *id. t. c.* p. 98.

Mallosia imperatrix, Anti-Lebanon, Abeille, Bull. Soc. Ent. Fr. (6) v. p. cxl.

Phytœcia farinosa, Caucasus, p. 522, *astarte*, Asia Minor, p. 523, *P.* (*Helladia*) *adelpha*, Syria, p. 522, *P.* (*Coptosia*) *fausti*, Persia, p. 521, Gangl., Verh. z.-b. Wien, xxxv.

Chrysomelidæ.

[*Cf.* Duvivier (96), Jacoby (124, 154, 155), Weise (360).]

Énumération des Coléoptères Phytophages décrits postérieurement au Catalogue de MM. Gemminger et von Harold. Hispides et Cassides, par C. von den Branden, Mém. Liège, xi. (Mém. 10, pp. 16).

Liste des Sagrides, Criocérides, Clytrides, Mégalopides, Cryptocéphalides, et Lamprosomides décrits postérieurement au Catalogue de MM. Gemminger et von Harold, par H. Donckier de Donceel. Mém. Liège, xi. (Mém. 14), 31 pp.

Catalogue des Chrysomélides, Halticides, et Galerucides décrits postérieurement à la publication du Catalogue de Munich, par Antoine Duvivier. Mém. Liège, xi. (Mém. 15), 64 pp.

Sagrides.

Mecynodera wickhami, Queensland, sp. n., Waterh., Ann. N. H. (5) xv. p. 342,

Donaciides.

Donacia cincticornis, Newm. (= *lucida*, Lac.) (but *cf.* Henshaw's list, p. 104); Horn, Ent. Am. i. p. 9. *D. thalassina*: observations on specific characters of it and allied species; Thoms., Bull. Soc. Ent. Fr. (6) iv. p. cxlviii.

Donacia brevitarsis, Thoms., *t. c.* p. cxlix., Europe (no locality mentioned); *D. provostii*, Pekin, Fairm., Bull. Soc. Ent. Fr. (6) v. p. lxiv.; *D.* (*Plateumaris*) *weisei*, Siberia, Duviv., C.R. ent. Belg. 1885, p. cxvi.; *D. gracilipes*, p. 191, *constricticollis*, p. 192, pl. xi. fig. 2, Japan, Jac., P. Z. S. 1885: spp. nn.

Hæmonia japana, sp. n., Japan, Jac., *t. c.* p. 190, pl. xi. fig. 1.

Criocerides.

Variation of *Syneta adamsi* and *Lema adamsi* and *dilecta*, Baly, noticed; *id. t. c.* pp. 193 & 194.

Crioceris lewisi, p. 194, pl. xi. fig. 3, *orientalis*, p. 195, Japan, spp. nn., *id. t. c.*

Lema nigra, France, Delh., Le Nat. vii. p 120; *L. balteata*, Arizona, *concolor*, N. Mexico, Lec., Tr. Am. Ent. Soc. xii. p. 24; *L. nigripes*, Porto Rico, Weise, Arch. f. Nat. li. p. 145: spp. nn.

Megalopides.

Pedrillia nigricollis, p. 195, *varipes*, p. 196, *unifasciata*, p. 197, pl. xi. fig. 4, Japan, Jac., P. Z. S. 1885, spp. nn.

Pedrillia annulata, Baly, variation of; *id. t. c.* p. 195.

Clythrides.

Clythra (sub *Cryptocephalus*) *quadrinotata*, Fab. (= *C. opaca*, Rosenh.), previous determinations of the Fabrician description being erroneous; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 89.

Clythra subg. *Otiocephala*. The 3 species forming this subgenus differ only by the extension, which moreover is variable, of the elytral spots; *id. ibid.*

Leconte notices *Coscinoptera rittigera*, *Euryscopa vittata* and *lecontii*; Tr. Am. Ent. Soc. xii. p. 25.

Labidostomis subfasciata, p. 313, Caspian, *reitteri*, p. 314, Lenkoran, spp. nn., Weise, Deutsche e. Z. xxix.

Coscinoptera dorsalis, *bifaria*, Arizona, *canella*, California, spp. nn., Lec., *t. c.* p. 25.

Saxinis apicalis, Arizona, sp. n., *id. ibid.*

Megalostomis unicincta, sp. n., Venezuela, Lefèvre, Bull. Soc. Ent. Fr. (6) iv. p. cxlix.

Chlamydes.

Chlamys spilota, Baly, variation of; Jac., P. Z. S. 1885, p. 199. *C. japonica*, *id. t. c.* p. 198, pl. xi. fig. 198; *C. holubi*, S. Cent.-Africa, Dohrn, S. E. Z. xlvi. p. 148; spp. nn.

Cryptocephalides.

Cryptocephalus elatus, Suff., *nec* Fab., renamed *subelatus*; Tappes, Bull. Soc. Ent. Fr. (6) x. p. xli. *C. nigro-cinctus*, Suf., noticed; Weise, Arch. f. Nat. (2) li. p. 146. *C. acupunctatus*, Fairm. (= *C. acupictus*, Mars.), and *C. fulgurans*, Fairm. (= *C. fulguritus*, Mars.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 89. *C. nobilis*, Kr., figured; Jac., P. Z. S. 1885, pl. xi. fig. 7: noticed, p. 203. *C. liothorax*, Sols., and *Pachybrachys erudita*, Baly, variation of; *id. ibid.*

Cryptocephalus interstitialis, Madagascar, *id.* Ent. M. M. xxi. p. 222; *C. limbatipennis*, p. 199, *nigrofasciatus*, *partitus*, pl. xi. fig. 8, p. 200, *difformis*, fig. 6, p. 201, Japan, *id.* P. Z. S. 1885; *C. tristiculus*, p. 147, *krugi*, p. 148, pl. viii. fig. 1, *stolidus*, p. 149, fig. 2, *perspicax*, p. 151, fig. 3, *nothus*, p. 152, fig. 12, Porto Rico, Weise, Arch. f. Nat. li.: spp. nn.

Pachybrachys mendicus, Porto Rico, sp. n. *id. t. c.* p. 153, pl. viii. fig. 4.

Stylosomus xantholus, provisional sp. n., Montpellier, Rey, Rev. d'Ent. iv. p. 274.

Lamprosoma cupreatum, Baly, variation of; Jac., P. Z. S. 1885, p. 198. *L. longifrons*, Lac., noticed; Weise, Arch. f. Nat. li. p. 154. *L. ricinum*, sp. n., Brazil, Duviv., C.R. ent. Belg. 1885, p. cxvii.

Oomorphus japanus, sp. n., Japan, Jac., P. Z. S. 1885, p. 197.

Eumolpides.

Lefèvre, E. Eumolpidarum hucusque cognitarum catalogus, sectionum conspectu systematico, generum sicut et specierum novarum descriptionibus adjunctis. Mém. Liège, xi. (Mém. 16), 172 pp.

The numerous changes in generic position of species effected in this memoir are not here recorded. The title does not appear in our list of Titles, as the Recorder could not obtain the memoir till after the list had been printed.

Leconte tabulates the species of *Graphops*, Lec. (= *Heteraspis*, Lec., *olim*), and notices *Colaspis arizonæ* ; Tr. Am. Ent. Soc. xii. p 23.

Phaseus (sub *Nodostoma*) *vulgaris*, Chap. (= *P. maculatus*, Lefv.) ; Lefèvre, Bull. Soc. Ent. Fr. (6) v. p. xl.

New genera and species :—

Ischyrolampra, n. n. for *Eulampra*, Baly (*nec* Chaud.) ; Lefv., Mém. Liège, xi. p. 166.

Phædrias, n. n., for *Phædra*, Chp. (*nec* Horsf.), p. 166 ; *id. t. c.*

Nodonota, n. n. for *Noda*, Chp. (*nec* Schellenb.), p. 166 ; *id. t. c.*

Sibotes, g. n., after *Teaspis*, for *S. ater*, Brazil, sp. n., p. 20 ; *id. t. c.*

Eurysarcus, n. n. for *Polysarcus*, Lefv. (*nec* Fieb.), p. 24 ; *id. t. c.*

Gastropius, g. n., after *Adorea*, for *G. insignis*, Ecuador, sp. n. ; *id. t. c.* p. 167.

Dolichenus, n. n. for *Dolometis*, Har. (*nec* Cab.), p. 39 ; *id. t. c.*

Alethaxius, n. n. for *Aletes*, Chp. (*nec* Carp.), p. 42 ; *id. t. c.*

Agetinus, n. n. for *Agetus*, Chp. (*nec* Kroys.), p. 43 ; *id. t. c.*

Rhabdopterus, n. n. for *Rhabdophorus*, Lefv. (*nec* Swains.), p. 46 ; *id. t. c.*

Eupales, n. n. for *Pales*, Redt. (*nec* Rob.-Des.), p. 50 ; *id. t. c.*

Corysthea, n. n. for *Corycia*, Baly (*nec* Hubn.), p. 54 ; *id. t. c.*

Phædroides, g. n. (*Nodostomites*), for *P. phillipinensis*, sp. n. ; *id.* Bull. Soc. Ent. Fr. (6) v. p. cxxv.

Obclistes, g. n., next *Odontionopa*, for *O. varians*, Old Calabar, sp. n., p. 66 ; *id.* Mém Liège, xi.

Pagellia, g. n., for *P. acuticosta*, *foveolata*, *suturalis*, Philippines, spp. nn., p. 70 ; *id. t. c.*

Semmiona, g. n. (*Scelodontites*), p. cxxvii., for *S. squameoguttata*, sp. n., Niam-Niam ; Fairm., Bull. Soc. Ent. Fr. (6) v.

Callipta, n. n. for *Calliope*, Weise ; *Pseudocolaspes oberthuri* belongs to the genus : Lefv., Bull. Soc. Ent. Fr. (6) v. p. cxxiv.

Eurysthenes, n. n. for *Eurytus*, Chp. (*nec* Albers), p. 88 ; *id.* Mém. Liège, xi.

Himerida, n. n. for *Himera*, Chp. (*nec* Dup.), p. 90 ; *id. t. c.*

Ennodius, n. n. for *Enipeus*, Chp. (*nec* Raf.), p. 90 ; *id. t. c.*

Clypeolaria, g. n. (*Metachromites*), for *C. thoracica*, sp. n., Bohol ; *id.* Bull. Soc. Ent. Fr. (6) v. p. cxxvi.

Ocnida, n. n. for *Ocnus*, Clk. (*nec* Forbes), p. 111 ; *id.* Mém. Liège, xi.

Edusia, n. n. for *Edusa*, Chp. (*nec* Albers), p. 112 ; *id. t. c.*

Cleptor, g. n., next *Edusia*, for *C. inermis* and *C. rufimanus*, Australia, p. 113, spp. nn. ; *id. t. c.*

Argoa, n. n. for *Argolis*, Chap. (*nec* Stål.) p. 116 ; *id. t. c.*

Eurypelta, n. n. for *Euraspis*, Chp., which is a typographical error for *Euryaspis*, which is preoccupied by Blanchd. ; *id. t. c.* p. 118.

Liniscus, g. n. (*Typophoritæ*), p. 129, for *L. sansibaricus*, sp. n. Zanzibar, p. 130 ; *id. t. c.*

Tricliona, g. n., near *Thyrasia*, for *T. fasciata*, *nigro-maculata*, spp. nn., Sumatra ; *id.* Bull. Soc. Ent. Fr. (6) v. p. cxlvii.

Cleorina, g. n., p. 143, for *C. aulica*, *metallica*, Java, *castanea*, *morosa*, Philippines, *janthina*, Hong Kong, *nobilis*, India, p. 144, *pulchella*, Australia, *sumatrensis*, Sumatra, *tibialis*, Philippines, p. 145, spp. nn. ; *id.* Mém. Liège, xi.

Aporistus, n. n. for *Aporus*, Lefv. (*nec* Spinola), p. 156; *id. t. c.*

Melinophora, n. n. for *Mellina*, Chp. (*nec* Retzius, &c.), p. 157); *M. nigripes*, Brazil, sp. n., *ibid.*, *id. t. c.*

Chrysodina collaris, *opacicollis*, Brazil, *gracilis*, Buenos Ayres, *jucunda*, Peru, *lævicollis*, Carthagena, p. 7, *parvula*, Colombia, *reticulata*, Brazil, *tarsalis*, Peru, p. 8, *id.* Mém. Liège, xi.

Lamprosphærus amœnus, Amazons, p. 9, *fulgidus*, Peru, *janthinus*, Bogota, *ornatus*, Amazons, *unicolor*, Cayenne, *venustus*, Bogota, p. 10, *rufipes*, Amazons, p. 166, *id. t. c.*

Balya jacobyi, *id.* Bull. Soc. Ent. Fr. (6) iv. p. cl., Mendoza.

Agrianes cyanicornis, Brazil, p. 14, *id.* Mém. Liège, xi.

Noda acuminata, Colombia, *granosa*, Brazil, p. 16, *insignis*, Colombia, *ruficornis*, *spinulosa*, Brazil, p. 17, *tibialis*, Bogota, p. 18, *id. t. c.*

Lepronota fulvicornis, Brazil, p. 19, *id. t. c.*

Teaspes lugubris, Brazil, p. 20, *id. t. c.*

Agbalus elongatus, Ecuador, *flavipes*, p. 21, *peruanus*, Peru, *rutilans*, Colombia, *tarsalis*, Cumana, p. 22, *id. t. c.*

Choris cærulea, Bogota, p. 23, *id. t. c.*

Eurysarcus rufinus, Bahia, p. 166, *id. t. c.*

Coytiera rugipennis, Brazil, p. 167, *id. t. c.*

Colaspis adusta, Bahia, *varia*, Colombia, p. 31, *cyanea*, Bahia, *dugesi*, Mexico, p. 32, *flavicans*, Am. bor., *gemellata*, Colombia, p. 33, *pectoralis*, p. 34, *propinqua*, Brazil, *speciosa*, Venezuela, p. 35, *tibialis*, Brazil, p. 36, *corrugatus*, Amazons, p. 168, *id. t. c.*

Hermesia janthina, Venezuela, sp. n., p. 39, *id. t. c.*

Campylochira metallica, Brazil, p. 41, *id. t. c.*

Podozenus peruvianus, p. 42, *id. t. c.*

Agetinus geniculatus, Ecuador, *prolixus*, Bogota, p. 43, *id. t. c.*

Rhabdopterus chiliensis, Chili, *cupreatus*, Colombia, p. 46, *kirschi*, Bogota, *limbalis*, Cayenne, *obsitus*, *versutus*, Venezuela, p. 47, *id. t. c.*

Corysthea impressicollis, Ecuador, p. 55, *id. t. c.*

Nodostoma cyrtopus, p. 58, *janthinium*, p. 59, *philippinense*, p. 60, Philippines, *id. t. c.*; *N. martini*, Tonkin, *id.* Bull. Soc. Ent. Fr. (6) v. p. lxv.; *N. ruficolle*, pl. xi. fig. 10, *japonicum*, p. 205, *modestum*, p. 206, Japan, Jac., P. Z. S. 1885.

Nodina celebensis, *id.* Ann. Mus. Genov. (2) ii. p. 22.

Tonyris elegantula, Tasmania, *pusilla*, K. Geo. Sound, p. 64, Lefv., Mém. Liège, xi.

Odontionopa chloris, C. Good Hope, p. 65, *id. t. c.*

Scelodonta æneola, Philippines, *corrugata*, Old Cal., *dispar*, Philippines, p. 68, *id. t. c.*; *S. pulchra*, Sumatra, &c., Schauf., Hor. Ent. Ross. xix. p. 207.

Trichotheca vagans, Texas, Lec., Tr. Am. Ent. Soc. xii. p. 26.

Fidia lurida, Am. bor., p. 76, Lefv., Mém. Liège, xi.

Aulexis flavopilosa, Philippines, p. 76, *humilis*, Ins. Juthia, *luzonica*, *puberula*, *pusilla*, Philippines, p. 77, *id. t. c.*

Habrophora costulata, Brazil, p. 78, *id. t. c.*

Leprotes pulverulentus, Japan, Jac., P. Z. S. 1885, p. 203, pl. xi. fig. 9.

Demotina bipunctata, Japan, *id. t. c.* p. 204.

Hemiplatys chapuisi, Malacca, p. 81, Lefv., Mém. Liège, xi.

Eryxia virescens, Abyssinia, p. 82, Lefv., Mém. Liège, xi.

Heteraspis morosa, Ins. Juthia, *id. ibid.*

Metachroma antennalis, Porto Rico, Weise, Arch. f. Nat. li. p. 155.

Rhyparida fulvo-limbata, Sidney, p. 95, Lefv., *t. c.*

Chrysopida aureo-villosa, curta, depressicollis, pubipennis, semperi, Philippines, p. 99, *id. t. c.*

Colasposoma annamita, asperatum, Cochin China, *cribratum*, Caffraria, p. 104, *gounellei*, India, *ovulum*, p. 105, *pilosum*, Natal, *rugiceps*, Burmah, *serratulum*, Malacca, p. 106, *velutinum*, Senegal, *villosulum*, p. 107, Coromandel, *id. t. c.*; *C. regularis*, New Guinea, Jac., Ann. Mus. Genov. (2) ii. p. 22.

Abirus rubripes, Ceylon, *tuberculipennis*, Philippines, p. 114, Lefv., *t. c.*

Tymnes omoplata, Mexico, p. 115, *id. t. c.*

Mecistes seriatus, Natal, p. 122, *id. t. c.*

Typophorus furvus, Brazil, p. 131, *id. t. c.*

Phytorus cyclopterus, ferculus, gibbosus, nigripes, plebeius, p. 134, *punctipennis*, all from Philippine Islands, *simplex*, p. 135, Malacca, spp. nn., *id. t. c.*

Stethotes tibialis, Tonkin, *id.* Bull. Soc. Ent. Fr. (6) v. p. lxv.

Syagrus aratus, Gaboon, p. 138, *id.* Mém. Liège, xi.

Rhembastus bicolor, Madagascar, p. 139, *id. t. c.*

Irongius inconstans, Madagascar, p. 140, *id. t. c.*

Corynoides chapuisi, Pulo-Penang, p. 147, *egregius*, Philippines, *gibbifrons*, Siam, p. 148, *simplicicornis*, Philippines, p. 150, *id. t. c.*; *C. cribratellus, cærulescens*, Niam-Niam, Fairm., Bull. Soc. Ent. Fr. (6) v. p. lxxii.; *C. rutilans*, Lefv., *op. cit.* iv. p. cxlix, Malacca.

Chrysochus robustus, Arizona, Horn, Tr. Am. Ent. Soc. xii. p. 156.

Colaspoides simplicipennis, Cape York, p. 20, *nigritarsis*, Sumatra, p. 21, Jac., Ann. Mus. Genov. (2) ii.; *C. martini*, Tonkin, Lefv., Bull. Soc. Ent. Fr. (6) v. p. lxvi.; *C. femoralis*, China, *hypoxantha*, Amazons, p. 158, *nigromaculata*, p. 159, *vulgata*, p. 160, Brazil, *id.* Mém. Liège, xi.

Chrysomelides.

Jacoby comments on variation of *Chrysomela geminata*, Payk., and *Phytodecta rufipes*, De G., *gracilicornis* and *nigroplagiata*, Baly; P. Z. S. 1885, pp. 207–210.

Chrysomela semiopaca, Fairm., is a var. of *confossa*, Fairm., the "species being a remarkable instance of dichroism"; Bedel, Ann. Soc. Ent. Fr. (6) v. p. 89.

Dugès, E. Métamorphoses de la *Leptinotarsa undecimlineata*, Stål. Ann. Ent. Belg. xxviii. pp. 1–5, pl. i.

Orina. Ueber die Entwicklung und Zucht der *Orinen*; Weise, Deutsche e. Z. xxix. pp. 403–406. Table of the Gallo-rhenane species; Fauv., Rev. d'Ent. iv. pp. 271–274.

Note on *Chrysomela scalaris*, with figs. of varieties; Aug., Ent. Am. i. p. 126. Larva of *C. clavicollis*, Kirb., described; Canad. Ent. xvii. p. 19.

Timarcha tenebricosa, F., and *violaceonigra*, Deg., biology of; Budd., JB. nass. Ver. xxxviii. pp. 101–105.

Phyllocharis jansoni, p. 23, noticed ; Jac., Ann. Mus. Genov. (2) ii.

Pkratora vitellinæ, ravages of ; Orm., Rep. viii. p. 93.

Paropsis sp. ? figured and described ; Tepper, Tr. R. Soc. S. Austr. vii. p. 48, pl. iii.A.

New genera and species :—

Æsernoides, near *Æsernia*, for *Æ. nigrofasciatus*, sp. n., Queensland ; Jac., Ent. M. M. xxi. p. 223.

Hadroscelus, perhaps near *Gonioctena*, for *H. schulzii*, sp. n., in copal from Benguela ; Qued., B. E. Z. xxix. p. 364.

Melasoma nigritarsis, Delagoa Bay, Jac., Ent. M. M. xxi. p. 226.

Plagiodera philippinensis, Phil. Is., Duviv., C.R. ent. Belg. 1885, p. cxviii. ; *P. bistripunctata*, Chiriqui, *id. ibid.* ; *P. chapuisi*, *riparia*, New Guinea, Jac., Ann. Mus. Genov. (2) ii. p. 24.

Chrysomela cyrtonoides, p. 206, *nikkoensis*, p. 207, *obscurofasciata*, p. 208, pl. xi. fig. 11, Japan, *id.* P. Z. S. 1885 ; *C. carigera*, p. 35, *magniceps*, p. 38, Tschuktscha Penins., Sahl., Veg. exp. Vet. iv.

Orina dolens, Samarcand, Kr., Deutsche e. Z. xxix. p. 298.

Gastrolina japonica, Japan, Jac., P. Z. S. 1885, p. 210, pl. xi. fig. 12.

Leucocera lævicollis, Porto Rico, Weise, Arch. f. Nat. li. p. 156, pl. viii. fig. 5.

Xenomela heydeni, Turkestan, p. 406, *fuscipes*, Samarcand, p. 407, *id.* Deutsche e. Z. xxix.

Phyllocharis impressicollis, Cape York, Jac., Ann. Mus. Genov. (2) ii. p. 24 ; *P. cyanicornis* var. n. *confluens*, Torres Strait, *id.* Ent. M. M. xxi. p. 225.

Chalcolampra rufipes, Queensland, *id. ibid.*

Lamprolina unicolor, Australia, *id. ibid.*

Australica suturalis, Cape York, *id.* Ann. Mus. Genov. (2) ii. p. 25.

Calomela (*Australica*) *capitata*, Queensland, *sexmaculata*, New Guinea, *id.* Ent. M. M. xxi. p. 224.

Stethomela basalis, p. 25, *papuana*, p. 27, *varians*, p. 28, *chapuisi*, p. 29, *semiviolacea*, p. 30, New Guinea, *palliata*, p. 26, Aru Is., *fulvicollis*, p. 27, Cape York, *id.* Ann. Mus. Genov. (2) ii.

Phytodecta robusta, p. 209, Japan, *id.* P. Z. S. 1885 ; *P. scutellaris*, Behring Straits, Amer. coast, Sahl, Veg. exp. Vet. iv. p. 55.

Halticides.

Jacoby, Biol. Centr. Am. *Col.* vi. (1) pp. 337–408, notices or figures the following previously known forms :—*Sangaria haagi*, p. 340, pl. xx. fig. 20 ; *Epitrix atripes*, *fuscata*, *cucumeris*, *opacicollis*, *fuscula*, *ubaquensis*, *parvula*, pl. xxi. fig. 6 ; *Trichaltica bogotana*, *ibid.* fig. 7 ; *Crimissa cruralis*, *ibid.* fig. 8 ; *Dibolia borealis*, *ibid.* fig. 10 ; *Ptocadica straminea* ; *Aphthona deyrollei*, *diversa*, *ibid.* fig. 20, *pilatei* ; *Phyllotreta lewisi* ; *Longitarsus subcinctus*, *colombicus*, *bogotanus*, *buckleyi*, *concinnus* ; *Notozona elegans*, *histrionica*, pl. xxii. fig. 9, *sparsa* ; *Oxygona acutangula* ; *Chætocnema laticollis*, probably from Central America, not Australia ; *Asphera abdominalis*, *abbreviata*, *cyanopis*, pl. xxiii. fig. 9, *clerica*, Er. (= *laticollis*, Jacoby), *nobilitata*, *albida*, *pallida*, fig. 8 ; *Homophœta*

variabilis, fig. 2, *recticollis*, fig. 3 (= *militaris*, Jacoby), *albo-fasciata*, fig. 1, *affinis*, fig. 5, *æquinoctialis*, *cinctipennis*, fig. 6, *Œdionychis reichei*, fig. 11, *ceracollis*, p. 408.

Jacoby, Ann. Mus. Genov. (2) ii., specially notices *Nisotra gemella* ?, Er., p. 34, *Sphæromelopa acroleuca*, Wied., p. 43, *Sebaethe lusca*, Fab., p. 48, *Sphæroderma apicipennis*, Baly, p. 54, *Phyllotreta malayana*, Baly, p. 63, *Psylliodes cognata* ?, Baly, p. 64, and on p. 57 gives characters for *Eucycla*, Baly.

Liprus, Motsch., the characters and position of, discussed; *id. t. c.* p. 72.

Weise, Arch. f. Nat. li. pp. 159–165, notices *Omototus ferrugineus* and *Aphthona compressa*, Suf., *Epitrix fuscata*, Duv., and refers *Haltica asphaltina*, Suf., to *Crepidodera*.

Haltica burgessi, Crotch, is a *Caeporis*; Lec., Tr. Am. Ent. Soc. xii. p. 29.

Lithonoma favieri, Fairm. (= *L. cyanea*, Tourn.); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 90.

Longitarsus exoletus, L., and *melanocephalus*, Gyll., biology of; Budd., JB. nass. Ver. xxxviii. pp. 105–108.

Riley, Rep. Ent., has economic and descriptive notes on *Phyllotreta vittata*, pp. 301–304, describes larva, p. 304, figures insect, pl. iii. fig. 6; *P. zimmermanni*, metamorphoses, pp. 304–308, pl. iv. figs. 1, *a*, *b*, *c*; *P. albionica*, pl. ix. fig. 7.

Haltica (*Phyllotreta*) *nemorum*, ravages of; Orm., Rep. viii. p. 83.

New genera and species:—

Erystus, near *Arsipoda*, p. 39, for *E. celebensis*, sp. n., p. 40, Celebes; Jac., Ann. Mus. Genov. (2) ii.

Mesodera, near *Crepidodera*, *id.* Biol. Centr. Am. *Col.* vi. (1) p. 344, for *M. fulvicollis*, Panama, p. 345, pl. xx. fig. 24, sp. n.

Pseudoepitrix, next *Sangaria*, *id. t. c.* p. 341, for *P. hirtipennis*, pl. xx. fig. 22, p. 341, *vittatipennis*, fig. 23, p. 342, Panama, spp. nn.

Manobia, near *Lactica*, for *M. nigripennis*, p. 73, *pallipes*, p. 74, *basalis*, *fulvicollis*, p. 75, Sumatra, spp. nn.; *id.* Ann. Mus. Genov. (2) ii.

Aphthonoides, near *Aphthona*, for *A. beccarii*, sp. n., Java; *id. t. c.* p. 59.

Neoprava, near *Aphthona*, for *N. submetallica*, sp. n., Sumatra; *id. t. c.* p. 38.

Luprea (*Aphthoninæ*, but similar to *Luperus*), *id.* Biol. Centr. Am. p. 359, for *L. longicornis*, Guatemala, *fulvicollis*, pl. xxi. fig. 11, Guatemala, Nicaragua, *ibid.*, spp. nn.

Palæothona, near *Phyllotreta*, *id.* p. 377, for *P. rugifrons*, Mexico, pl. xxii. fig. 6, *guatemalensis*, p. 377, *longicornis*, fig. 7, *unicostata*, Guatemala, *semifulva*, p. 378, *subrugosa*, Panama, *violacea*, Guatemala, *frontalis*, Mexico, p. 389, spp. nn.

Chrysogramma, following *Palæothona*, *id.* p. 380, for *C. octomaculata*, Guatemala, p. 380, pl. xxii. fig. 8, sp. n.

Acrocyum, before *Notozona*, *id.* p. 380, for *A. dorsalis*, pl. xxii. fig. 23

sallæi, fig. 25, p. 381, *maculicollis*, fig. 24, Mexico, *tarsata*, Guatemala, p. 382, spp. nn.

Pseudogona, near *Oxygona*, *id.* p. 390, for *P. panamensis*, *chiriquensis*, pl. xxii. fig. 2, Panama, p. 391, spp. nn.

Pseudadorium, facies of *Adorium*, but belongs to the *Aspicelites*, near *Rhopalotoma*; Fairm., Ann. Soc. Ent. Fr. (6) iv. p. 239: for *P. vernicatum*, Madagascar, sp. n., *ibid.*

Eudolia, ? near *Liprus*, for *E. sumatrana*, sp. n.; Jac., Ann. Mus. Genov. (2) ii. p. 69.

Thrasycoma, p. 70, for *T. submetallica*, Sumatra, sp. n.; *id. t. c.* p. 71.

Nissotra signatipennis, Madagascar, p. 241, *bicolor*, Swan River, p. 385, Duviv., S. E. Z. xlvi.; *N. obliterata*, New Guinea, p. 35, *chrysomeloides*, Borneo, p. 36, Jac., Ann. Mus. Genov. (2) ii.

Notozona semifasciata, p. 383, pl. xxii. fig. 10, Guatemala, *nicaraguensis*, Nicaragua, p. 384, *id.* Biol. Centr. Am. *Col.* vi. (1).

Podagrica cyanipennis, I. of St. Thomas, Weise, Arch. f. Nat. li. p. 165.

Simaethia biplagiata, Sumatra, Jac., Ann. Mus. Genov. (2) ii. p. 46.

Arsipoda parvula, Cape York, *id. t. c.* p. 34.

Crepidodera seminigra, p. 65, Cape York, *unicolor*, p. 66, Sumatra, *gestroi*, *dubiosa*, p. 67, New Guinea, *id. t. c.*; *C. chiriquensis*, Panama, p. 342, pl. xx. fig. 25, *semihirsuta*, *guatemalensis*, *pallipes*, p. 343, Guatemala, *obliterata* (genus?), p. 344, Guatemala, Panama, *id.* Biol. Centr. Am. *Col.* vi. (1).

Epitrix violacea, pl. xxi. fig. 1, *puncticollis*, p. 346, *thoracica*, fig. 2, p. 347, Guatemala, *clypeata*, p. 348, Brit. Honduras and Guatemala, *montana*, Mexico and Guatemala, p. 349, *minuta*, Guatemala, p. 350, *convexa*, Guatemala, *intermedia*, fig. 3, p. 351, Mexico and Guatemala, *dilaticornis*, fig. 4, Guatemala, Panama, *fulvifrons*, p. 352, Guatemala, *subcostata*, fig. 5, Panama, *pulchella*, Mexico and Panama, p. 353, *haroldi*, *castanea*, p. 354, Guatemala, *subglabrata*, p. 355, Panama, *id. t. c.*

Liprus malayanus, p. 71, Sumatra, *id.* Ann. Mus. Genov. (2) ii.

Systena marmorata, *quadraticollis*, Panama, p. 337, *megasceloides*, Guatemala, p. 338, *id.* Biol. Centr. Am.; *S. varia*, Porto Rico, Weise, Arch. f. Nat. li. p. 164, pl. viii. fig. 9.

Disonycha pallipes, Porto Rico, *id. t. c.* p. 159.

Clamophora nigritarsis, pl. xx. fig. 21, Panama, *salvini*, Guatemala, p. 339, Jacoby, *t. c.*

Caeporis nanula, N. America, Lec., Tr. Am. Ent. Soc. xii. p. 29.

Lactica bicolor, p. 387, Brazil, *australis*, p. 388, Queensland, Duviv., S. E. Z. xlvi. p. 388.

Hermæophaga cylindrica, Porto Rico, Weise, *t. c.* p. 160.

Trichaltica variabilis, p. 356, pl. xxi. fig. 9, Brit. Honduras to Panama, Jacoby, *t. c.*

Longitarsus chontalensis, Nicaragua, *angusticollis*, p. 373, *chiriquensis*, *intermedius*, Panama, p. 374, *nigricornis*, Nicaragua, p. 375, *apicicornis*, Guatemala, p. 376, *id. t. c.*; *L. nigricollis*, Sumatra, *id.* Ann. Mus. Genov. (2) ii. p. 65.

Aphthona papuensis, p. 63, New Guinea, *fulvicollis*, p. 64, Cape York, *d. t. c.*; *A. obscuripennis*, Guatemala, pl. xxi. fig. 19, *semicærulea*,

Mexico, p. 362, *championi*, Mexico, Guatemala, *semipunctata*, fig. 22, Guatemala, Panama, p. 363, *pallipes*, fig. 18, *brunnea*, *pallidipennis*, p. 364, *maculipennis*, Guatemala, *variabilis*, Panama, p. 365, *mexicana*, fig. 21, Mexico, *fulvipennis*, fig. 24, Guatemala, *palpalis*, Panama, p. 366, *chiriquensis*, fig. 25, *robusta*, Panama, *aterrima*, fig. 23, Guatemala, p. 367, *brevicornis*, Panama, p. 368, Jac., Biol. Centr. Am

Phyllotreta serricornis, Manilla, Duviv, S. E. Z. xlvi. p. 387; *P. guatemalensis*, pl. xxi. fig. 14, *transversicollis*, Guatemala, p. 369, *abdominalis*, fig. 12, *nigricollis*, fig. 15, Panama, p. 370, *submetallica*, fig. 16, Guatemala, *mexicana*, fig. 13, p. 371, *crotchi*, fig. 17, Mexico, p. 372, Jacoby, Biol. Centr. Am.; *P. fulvicollis*, p. 60, Cape York, *nigricornis*, p. 61, *su uralis*, p. 62, New Guinea, *id.* Ann. Mus. Genov. (2) ii.

Sphærometopa quadripunctata, Borneo, *fulvicollis*, Sumatra, p. 41, *discoidalis*, Java, p. 42, *id. t. c.*; *S. nigricollis*, Malacca, Duviv., S. E. Z. xlvi. p. 386.

Oxygona bifasciata, Panama, p. 390, Jac., Biol. Centr. Am.

Chalænus dimidiata, Borneo, *id.* Ann. Mus. Genov. (2) ii. p. 36.

Chætocnema albertisi, Cape York, *id. t. c.* p. 37; *C. discoidalis* (= *mexicana*, Har., *nec* Baly), p. 395, *transversicollis*, pl. xxii. fig. 4, Panama, *capitata*, fig. 5, Mexico, Guatemala, *cephalotes*, Guatemala, p. 396, *fulvicornis*, Mexico, Guatemala, *frontalis*, Guatemala, p. 397, *id.* Biol. Centr. Am.

Asphæra transversofasciata, Panama, pl. xxiii. fig. 7, p. 399, *semifulva*, fig. 20, Costa Rica, *marginicollis*, Panama, p. 402, *chontalensis*, Nicaragua, *polita*, Mexico, Guatemala, p. 403, *nigrofasciata*, Guatemala, p. 404, *id. t. c.*

Sebaethe variabilis, Sumatra, p. 48, *celebensis*, p. 49, *pallida*, Celebes, *violaceipennis*, New Guinea, p. 50, *id.* Ann. Mus. Genov. (2) ii.

Sutrea balyi, p. 43, *dimidiatipennis*, *collaris*, p. 44, *violaceipennis*, p. 45, New Guinea, *id. t. c.*; *S. sumatrensis*, Sumatra, Duviv., C.R. ent. Belg. 1885, p. xlix.

Ophrida striatipennis, p. 32, *nigro-maculata*, p. 33, New Guinea, Jac., *t. c.*

Homophyla krugi, Porto Rico, Weise, Arch. f. Nat. li. p. 163, pl. viii. fig. 8.

Euplectroscelis variabilis, p. 392, pl. xxii. figs. 1 & 2, Mexico to Panama, *chontalensis*, Nicaragua, *brevicornis*, fig. 3, Guatemala, p. 393, Jac., Biol. Centr. Am.

Blepharida suturalis, Guatemala, pl. xxii. fig. 12, *reticulata*, fig. 11, p. 385, *mexicana*, fig. 16, *trifasciata*, fig. 14, p. 386, *marmorata*, fig. 13, *punctatissima*, fig. 17, *godmani*, fig. 18, p. 387, *maculicollis*, fig. 19, *quatuordecimpunctata*, fig. 15, p. 388, *unicolor*, fig. 21, *flohri*, fig. 20, p. 389, Mexico, *id. t. c.*

Homophæta championi, Costa Rica, Panama, p. 406, pl. xxiii. fig. 4, *id. t. c.*

Edionychis sumatrana, *id.* Ann. Mus. Genov. (2) ii. p. 76.

Hypolampsis guttatus, Louisiana, Lec., Tr. Am. Ent. Soc. xii. p. 29.

Sphæroderma cyanipennis, Sumatra, *celebensis*, Celebes, p. 53, *beccarii*, *funebris*, p. 55, Sumatra, Jac., *t. c.*

Argopistes insularis, New Guinea, &c., *id. t. c.* p. 56.

Dibolia championi, p. 358, Guatemala, Jac., Biol. Centr. Am.

Megistops fictor, Porto Rico, Weise, Arch. f. Nat. li. p. 162, pl. viii. fig. 7.

Psylliodes guatemalensis, tristis, Guatemala, p. 394, Jac., *t. c.*

Enneamera celebensis, Celebes, *lucipennis*, Aru I., *id.* Ann. Mus. Genov. (2) ii. p. 47.

Eucycla flavomaculata, p. 57, *malayana*, p. 58, New Guinea, *id. t. c.*

Galerucidæ.

Aulacophora melanoptera noticed, and *A. scutellata* var. n. *posticalis*; Schauf., Hor. Ent. Ross. xix. p. 208.

Diabrotica 4-*guttata*, Ol., and *innuba*, F., noticed; Weise, Arch. f. Nat. li. p. 156: and *Cerotoma ruficornis* var. n. *blandula*, p. 157, pl. viii. fig. 6.

Glyptolus viridis, Jac. Characters ♂ ♀; Duviv., C.R. ent. Belg. 1885, p. l.

Adoxia vulgaris, Broun, figured; Waterh., Aid, iii. pl. cliii. fig. 1.

New genera and species:—

Hovalia, affinity with *Ornithognathus* and with *Asbecesta*, Har.; Fairm., Ann. Soc. Ent. Fr. (6) iv. p. 240: for *H. comitata*, "Klug" (presumably sp. n.), *ibid.*, Madagascar.

Luperolophus, near *Alopena*, for *L. tenuecostatus*, sp. n., Madagascar; *id. t. c.* p. 241.

Taphina, between *Anthipha* and *Emathea*, for *T. dimidiata*, sp. n., Bodjo I.; Duviv., C.R. ent. Belg. 1885, p. lii.

Praeochralea, near *Ochralea*, for *P. antennalis*, Malay Is.; *id.* S. E. Z. xlvi. p. 245.

Aulacophora nigripeta, p. 389, Ceylon, *andamanica*, p. 390, Andaman Is., *id. t. c.*

Phyllobrotica livida, Arizona, Lec., Tr. Am. Ent. Soc. xii. p. 28.

Phyllecthrus texanus, Texas, *id. ibid.*

Diabrotica elegantula, p. 213, *consentanea*, p. 214, *gratiosa, histrionica*, p. 215, *spilota, nigronotata*, p. 216, *dysoni*, p. 217, *limbella, nigrolimbata*, p. 218, *inæqualis, haroldi*, p. 219, *placida*, p. 220, *bipustulata, lebasii*, p. 221, *amabilis, simulans*, p. 222, *labiata, virescens*, p. 223, *inconstans, ornatula*, p. 224, *mutabilis, gemmingeri*, p. 225, *formosa, viridipustulata*, p. 226, *chapuisi, sallei*, p. 227, *hexaspilota, virginella*, p. 228, *suffusa*, p. 229, Colombia, Baly, J. L. S. xix.

Agelastica bicolor, Arizona, Lec., *t. c.* p. 28.

Bonesia variabilis, Nyassa, Duviv., S. E. Z. xlvi. p. 242.

Malacosoma zanzibarica, Zanzibar, *id. t. c.* p. 391.

Cerophysa splendens, p. 392, Ceylon, *biplagiata*, p. 393, Hong Kong, *id. t. c.*

Chthoneis suturalis, Brazil, *id. t. c.* p. 243.

Luperus maculicollis, p. 27, *varicornis, torquatus*, p. 28, N. America, Lec., *t. c.*

Androlyperus maculatus, California (*cf.* Class. N. Am. Col. 2nd ed. p. 349), p. 28, *id. t. c.*

Galerucella varicornis, Porto Rico, Weise, Arch. f. Nat. li. p. 157.

Galeruca erosa, Utah, *id. t. c.* p. 28.

Leptosonyx hirtus, Mongolia, Weise, Deutsche e. Z. xxix. p. 315. (The genus is undescribed, but the characters are here informally mentioned.)

Haplosonyx collaris, Sumatra, Duviv., C.R. ent. Belg. 1885, p. li.; *H. nigricollis*, Nias I., *id.* S. E. Z. xlvi. p. 244.

Cynorta cavifrons, Ins. Philipp., *id. t. c.* p. 247.

Anthipha candezei, Sumatra, *id.* C.R. ent. Belg. 1885, p. li.

Hylaspes dohrni, Burmah, p. 246, (*H.*?) *ornatipennis*, China, p. 397, *id.* S. E. Z. xlvi.

Doryida balyi, Malacca, *id. t. c.* p. 394.

Parastetha? *apicipennis*, Bangkok, *id. t. c.* p. 395.

Theopea fairmairei, Java, *id. t. c.* p. 248; *T. weyersi, bodjoensis*, Bodjo I., *id.* C.R. ent. Belg. 1885, p. liii.

Platyxantha suturalis, Manilla, *id.* S. E. Z. xlvi. p. 398.

Hispides.

[*Cf.* Gestro (121), Baly (124), Gorham (126).]

Baly, J. S., Biol. Centr. Am. *Col.* vi. (2) pp. 1–72, commences the family *Hispidæ*. On p. 1 remarks are made on the habits of the species, and on p. 2 a description of the trophi is given, in correction of the views of Chapuis. The following known species are noticed or figured :—*Stenispa sallæi*, pl. i. fig. 2, *attenuata*; *Amplipalpa guerini*, fig. 3; *Alurnus ornatus*, fig. 4, *cassideus*, fig. 7; *Cephaloleia gratiosa*, fig. 10, *erichsoni*, fig. 14, *sallæi*, fig. 16, *pretiosa*, fig. 18, *vicina*, pl. ii. fig. 1, *ruficollis*, fig. 2; *Demotispa limbatella*; *Prosopodonta limbata*, fig. 6; *Arescus bicolor*, figs. 10 & 11, *perplexus*, figs. 12 & 13; *Cephalodonta quinquemaculata*, fig. 19, *javeti*, fig. 24, *scherzeri*; *Charistena perspicua*, pl. iii. fig. 2; *Chalepus morio*, fig. 4, *roseus* (= *philemon*, Newm.), but *inæqualis*, Web., is distinct, *californicus, bellulus*, fig. 15.

Gonophora wallacei, Baly, figured; Waterh., Aid, iii. pl. cliii. fig. 7.

New genera and species :—

Parallelispa, near *Stenispa*, Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 238, for *P. quadraticollis*, sp. n., p. 239, Madagascar.

Euxema (Sect. 1. Subsect. 1), Baly, *t. c.* p. 3, for *E. insignis*, sp. n., *ibid.* pl. i. fig. 1, Panama.

Parachalepus, *id. t. c.* p. 47, for *P. brevicornis*, p. 48, pl. iii. fig. 3, Mexico.

Stenispa brevicornis, Mexico, p. 4, *id. t. c.*

Alurnus salvini, p. 5, pl. i. fig. 5, Costa Rica, Panama, *id. t. c.*

Xanthispa cæruleipennis, Nicaragua, p. 6, pl. i. fig. 8, *id. t. c.*

Homalispa variabilis, pl. i. fig. 9, Panama, *limbifera*, Guatemala, p. 7, *gracilis*, Panama, p. 8, *id. t. c.*

Cephaloleia championi, Panama, pl. i. fig. 11, *ornata*, fig. 12, Nicaragua, p. 9, *nigropicta*, fig. 13, *distincta*, fig. 15, p. 10, *antennata, placida*, p. 11, Panama, *puncticollis*, Nicaragua to Panama, *congener*, Panama, p. 12, *perplexa*, Guatemala, *lata*, fig. 17, Panama, p. 13, *suturalis*, p. 14, Guatemala, Nicaragua, *discoidalis*, Mexico, *histrionica*, fig. 21, *dorsalis*, Panama, p. 15, *trivittata*, Guatemala, Panama, *semivittata*, p. 16, *elegantula*, fig. 22,

Panama, *lateralis*, Guatemala, p. 17, *instabilis*, figs. 23 & 24, Guatemala to Panama, p. 18, *stenosoma*, pl. ii. fig. 4, *intermedia*, p. 19, *leucoxantha*, *bella*, p. 20, *quadrilineata*, p. 21, Panama, *separata*, Mexico, *belti*, Nicaragua, p. 22, *consanguinea*, pl. i. fig. 25, *suaveola*, p. 23, Guatemala, *fulvolimbata*, pl. ii. fig. 3, Mexico and Guatemala, p. 24, *metallescens*, Guatemala, *leptomorpha*, Panama, p. 25, *tenella*, Guatemala, *stevensi*, pl. i. fig. 20, *sulciceps*, Panama, p. 26, *id. t. c.*

Demotispa limbata (on pl. ii. fig. 5, as *limbatella*), p. 27, Guatemala, *id. t. c.*

Prosopodonta costata, Panama, p. 29, pl. ii. fig. 7, *id. t. c.*

Cheirispa dorsata, p. 29, pl. ii. fig. 8, Nicaragua, Panama, *distincta*, fig. 9, Panama, p. 30, *id. t. c.*

Cephalodonta gemmans, p. 32, pl. ii. fig. 14 (erroneously as *C. generosa*), Guatemala, *callosa*, fig. 15, Panama, p. 33, *godmani*, figs. 16 & 17, Nicaragua, Panama, p. 34, *maculata*, fig. 18, Guatemala, p. 35, *championi*, fig. 2[illegible], Panama, p. 36, *pallida*, Nicaragua, *gracilenta*, fig. 21, p. 37, *elongata*, p. 38, Panama, *erudita*, fig. 22, *proxima*, fig. 23, Nicaragua, Panama, p. 39, *antennata*, fig. 25, Panama, p. 40, *obscurovittata*, Nicaragua, *posticata*, p. 41, *subparallela*, *abbreviata*, p. 42, Panama, *ampliata*, p. 43, *ferox*, pl. iii. fig. 1, *fraterna*, Nicaragua, p. 44, *id. t. c.*

Charistena championi, Guatemala, *funesta*, Mexico and Guatemala, p. 46, *id. t. c.*; *C. bicolor*, N. Mexico, Smith, Ent. Am. i. p. 95.

Chalepus championi, Panama, p. 50, *semilimbatus*, Mexico, *suturalis*, Guatemala, p. 51, *congener*, pl. iii. fig. 5, Panama, *placidus*, fig. 6, Guatemala, p. 52, *saundersi*, Guatemala, Panama, *opacicollis*, p. 53, *amicus*, fig. 7, Panama, p. 54, *terminatus*, Guatemala, Panama, *jansoni*, Nicaragua, *tibialis*, p. 55, *pallescens*, Panama, *distinctus*, fig. 9, Guatemala, p. 56, *breviceps*, Panama, p. 57, *fryi*, *diversipes*, Mexico, p. 59, *instabilis*, Mexico, Guatemala, *marmoratus*, Mexico to Panama, p. 60, *subapicalis*, p. 61, *vittaticollis*, Mexico, *viridanus*, fig. 8, Panama, p. 62, *productus*, Guatemala, p. 63, *contiguus*, fig. 12, Panama, *fraternus*, fig. 10, Mexico, p. 64, *pascoei*, Guatemala, *amabilis*, p. 65, *digressus*, Mexico, *nigripictus*, fig. 14, p. 66, *consanguineus*, fig. 13, *vicinalis*, p. 67, *hæmatoderus*, fig. 23, p. 69, Panama, *rufithorax*, Mexico, *sanguinosus*, Nicaragua, *chromaticus*, fig. 22, Guatemala to Panama, p. 70, *propinquus*, Mexico, Guatemala, *clypeatus*, Nicaragua, p. 71, *horni*, *subparallelus*, p. 72, Mexico, Baly, *t. c.*

Hispodonta chapuisii, New Guinea, Gest., Ann. Mus. Genov. (2) ii. p. 156.

Oxycephala bruijnii, Halmahera, p. 158, *metallica*, p. 159, *latirostris*, p. 160, *albertisii*, p. 161, New Guinea, *longissima*, Aru I., p. 162, *id. t. c.*

Anisodera elongata, Sumatra, p. 163, *id. t. c.*

Hispopria cæruleipennis, Philipp. Is., Duviv., S. E. Z. xlvi. p. 399.

Arescus waterhousei, Cauca, *id. t. c.* p. 249.

Gonophora unifasciata, p. 165, Celebes, *basalis*, p. 168, *minuta*, p. 171, Sumatra, *atra*, p. 169, Sarawak, *sinuata*, p. 170, Java, Gest., *t. c.*

Oncocephala angulata, Sumatra, *id. t. c.* p. 172.

Oethispa loricata, Porto Rico, Weise, Arch. f. Nat. li. p. 166.

Microrhopala uniformis, Arizona, Smith, Ent. Am. i. p. 94.

Odontota horni, Massachusetts, *id. t. c.* p. 91, *lateritia*, Arizona, p. 95.

Hispa postica, p. 175, *dimidiata*, Celebes, *cincta*, p. 177, New Guinea, Gest., Ann. Mus. Genov. (2) ii.

Cassidides.

[*Cf.* Gorham (126), Donceel (*larvæ*) (93).]

Cassida nebulosa destructive to *Beta vulgaris* ; Ent. Nachr. xi. p. 316.

Mesomphalia lineatocollis. Larva and pupa described ; Donc., Ann. Ent. Belg. xxix. p. 160, pl. i. figs. 13–19.

Mesomphalia latissima, Baly, *Ites plagiatus*, Waterh., figured ; Waterh., Aid, iii. pl. clvii. figs. 1 & 2.

Coptocycla sparsa, *sigillata*, p. 284, *spilota*, p. 285, Japan, spp. nn., Gorh., P. Z. S. 1885.

Omoplata axillaris, Sahl., larva described and eggs, p. 158, pl. i. figs. 1–9 ; *O.* sp. ?, *id.* p. 160, figs. 10–12 : Donc., Ann. Ent. Belg. xxix.

Aspidomorpha elliptica, Japan, sp. n., Gorh., P. Z. S. 1885, p. 280.

Oxylepus, g. n., near *Cassida*, for *C. deflexicollis*, Boh., and *O. capucinus*, Algeria (?), p. 100, *palæstina*, Palestine, p. 101, spp. nn. ; Desb., Col. Nord Afr. ii.

Oxylepus, Desb., is the same as *Chelysida*, Fairm., also *C. involuta*, Fairm., = (*O. capucinus*, Desb.), and the supposed species is probably only the very variable *Cassida deflexicollis*, Boh. ; *Cassida kæchlini*, Mars. (= *C. biskrensis*, Desb.) : Fairm., Bull. Soc. Ent. Fr. (6) v. p. liii.

Cassida biskrensis, p. 99, *ramifera*, p. 100, Algeria, Desb., Col. Nord Afr. ii. ; *C. nigroguttata*, Japan, Gorh., P. Z. S. 1885, p. 281 : spp. nn.

Languriidæ.

Peculiarities in structure of head that may assist in classification of this group noticed ; Fowler, Tr. E. Soc. 1885, pp. 381 & 382.

Langurites lineatus, Cast., described ; Horn, Tr. Am. Ent. Soc. xii. p 139.

Stenolanguria, g. n., p. 387, for *S. tricolor*, *gorhami*, p. 388, W. Africa, spp. nn. ; Fowl., Tr. E. Soc. 1885.

Callilanguria eximia, Philippines, sp. n., *id. t. c.* p. 383.

Languria nyassæ, p. 384, *calabarensis*, *dubia*, p. 385, *murrayi*, *femoralis*, p. 386, *monticola*, p. 387, W. Africa, *id. t. c.* ; *L. divisa*, N. America, Horn, Tr. Am. Ent. Soc. xii. p. 139 : spp. nn.

Erotylidæ.

[*Cf.* Gorham (127).]

Helota africana, Oll., *semifulva*, Rits., figured ; Waterh., Aid, iii. pl. cliii. figs. 3 & 4.

Amphisternus gibbosus, Sumatra, sp. n., Gorh., Ann. Mus. Genov. (2) ii. p. 517.

Eidoreus, g. n., near *Hypodacne* and *Euxestus*, for *E. minutus*, Hawaiian Arch., sp. n. ; Sharp, Tr. R. Dublin Soc. (2) iii. p. 146.

Euxestus minor, Oahu, sp. n., *id. t. c.* p. 145, pl. iv. fig. 14.

Tritomidea atripennis, Sumatra, Gorham, Notes Leyd. Mus. vii. p. 257 ; *T. xanthosticta*, Borneo, *id.* Ann. Mus. Genov. (2) ii. p. 517 : spp. nn.

Triplax emgei, Attica, sp. n., Reitt., Deutsche e. Z. xxix. p. 391.

ENDOMYCHIDÆ.

Gorham gives the true specific characters of *Encymon immaculatus, ruficollis*, and *angulatus*; Ann. Mus. Genov. (2) ii. pp. 518–520.

Beccaria, g. n., p. 321, near *Acinaces* and *Dryadites*, for *B. papuensis*, sp. n., New Guinea; *id. t. c.*

Monocoryna, p. 537, g. n. of rather doubtful position, perhaps near *Lithophilus*, for *M. decempunctata*, Sumatra, sp. n., p. 529; *id. t. c.*: figured in Waterh., Aid, iii. pl. clxvii. fig. 3.

Trycherus raffrayi, Zanzibar, sp. n., Gorh. *t. c.* p. 520.

Engonius brookei, Borneo, *id. t. c.* p. 521, sp. n.

Meilichius expetitus, Sumatra, *id. t. c.* p. 523, sp. n.

Mycetina doriæ, Borneo, *trimaculata*, Java, *id. t. c.* p. 524, spp. nn.

Stenotarsus plagiatus, p. 525, and *brevis*, p. 526, Sumatra, *albertisii*, p. 527, New Guinea, *id. t. c.*, spp. nn.

Diacles costipennis, sp. n., Fairmaire, Ann. Soc. Ent. Fr. (6) iv. p. 242, Madagascar.

Alexia glabra, sp. n., Bosnia, Reitt., Deutsche e. Z. xxix. p. 204.

COCCINELLIDÆ.

[*Cf.* Weise (358–360).]

Discursive observations on *Coccinellidæ*; Hagens, C.B. Ver. Rheinl. xxii. p. 86.

Mysia oblongoguttata, L. (= ? *Cocc. bisignata*, Fisch.); Weise, Best.-Tab. ii. p. 44.

Coccinella lyncea, Oliv. [= *Leis bissexnotata*, Muls., and (?) *C. billieti*, Muls.]; *id. t. c.* p. 40.

Coccinella maritima, Men., belongs to *Semiadalia*; *id. t. c.* p. 17.

Chilocorus opponens, Walk. [*cf. Nitidulidæ, ante* !].

Cryptogonus japonicus and *sinensis*, Crotch, are *Hyperaspis*, and the former (= *H. testaceicornis*, Weise); Weise, *t. c.* p. 58. *C. orbiculus*, Gyll. (probably = *centroguttatus*, Boh.); *id.* S. E. Z. xlvi. p. 233.

Brachyacantha bistripustulata, F., var. *guttata* described; *id. t. c.* p. 231.

Micraspis tetradyma, Fairm. (= *Brumus olcesei*, Crotch); Bedel, Ann. Soc. Ent. Fr. (6) v. p. 90.

Exochomus quadripustulatus, L. *Chilocorus nigropictus*, Fairm. (*picturatus*, Fairm., 1876), is the var. *anchorifer*, All., of this species; Crotch mentions the same race as "*ericæ*:" *id. ibid.*

Hyperaspis (sub *Coccinella*) *marmottani*, Fairm. (= *H. camillæ*, Allard), and *H. guttulata*, Fairm., is scarcely distinct; *Novius algiricus*, Allard (= *id.*, Crotch): *id. ibid.*

Larva of *Scymnus* sp. ? destroying *Phylloxera punctata*; CR. Ass. Fr. Sci. 1884, ii. p. 326.

Scymnus apiciflavus and *brunnescens*, Motsch., note on; Weise, S. E. Z. xlvi. pp. 235 & 236.

Rhizobius litura, Fab., metamorphoses; Budd., JB. nass. Ver. xxxviii. p. 108.

Lithophilus. *Cacidula villosa*, Fald. (sub *Coccidula*, Mun. Cat.), is certainly of this genus ; Weise, Best.-Tab. ii. p. 61.

Epilachna dorycu, Boisd., and var. n. *major*, from Celebes, noticed ; Schauf., Hor. Ent. Ross. xix. p. 209. *E. marginicollis*, Hope, and *mystica*, Muls., note on ; Weise, S. E. Z. xlvi. p. 229.

New species :—

Semiadalia apicalis, p. 16, *schneideri*, p. 17, Caucasus, Weise, Best.-Tab. ii.

Coccinella redimita, Turkestan, *id.* S. E. Z. xlvi. p. 234.

Chilocorus ruficollis, Celebes, *id. t. c.* p. 230.

Exochomus subæruleus, Columbia, *id. t. c.* p. 231.

Brumus lineatus, p. 229, Burmah, *septentrionis*, p. 230, Hudson's Bay, *id. t. c.*

Sticholotis hilleri, p. 238, *rufosignata*, p. 239, Japan, *cinctipennis*, Siam, *dohrni*, Burmah, p. 240, *id. t. c.* ; *S. debyi*, Sumatra, Duviv., C.R. ent. Belg. 1885, p. cxii.

Aspidimerus lætus, *lepidus*, Burmah, Weise, *t. c.* p. 233.

Hyperaspis apicalis (*festiva*, Muls., var. ?), Porto Rico, *id.* Arch. f. Nat. li. p. 167, pl. viii. fig. 11.

Scymnus (*Diomus*) *sphragitis*, p. 236, *scapularis*, *pumilio*, p. 237, S. Australia, *id.* S. E. Z. xlvi. p. 237 ; *S. globosus*, p. 71, S. Europe, *tristis*, Corsica, Spain, *damryi*, Corsica, p. 76, *id.* Best.-Tab. ii. ; *S. vividus*, p. 146, *ocellatus*, *discedens*, p. 147, Hawaiian Arch., Sharp, Tr. R. Dublin Soc. (2) iii.

Chnootriba hippodamoides, Congo, Weise, S. E. Z. xlvi. p. 227.

Corylophidæ.

Corylophodes, g. n., to include most of the species at present placed in *Corylophus* ; Matth., Ent. M. M. xxii. p. 160.

Corylophus rotundus, *saturalis*, Oahu, spp. nn., Sharp, Tr. R. Dublin Soc. (2) iii. p. 127.

Sericoderus basalis, *pubipennis*, p. 128, Hawaiian Arch., spp. nn., *id. t. c.*

Orthoperus æqualis, Hawaii, *id. ibid.* ; *O. columbianus*, Columbia, *borrei*, hab. ?, Matth., C.R. ent. Belg. 1885, p. lxviii. ; *O. punctatulus*, p. 108, *mundus*, p. 109, England, *id.* Ent. M. M. xxii. : spp. nn.

Arthrolips simoni, Syria, sp. n., Reitt., Wien. ent. Z. iv. p. 273.

Peltinus matthewsi, Syria, *alutaceus*, Dalmatia, spp. nn., *id. ibid.*

(B.) *HYMENOPTERA.*

APIDÆ.

Andrenides.

Melitta curiosa, Mor., is to be transferred to *Andrena*, where it will form a special group; ♀ described: Mor., Hor. Ent. Ross. xix. p. 181.

Andrena compta, Eversm. (= *orenburgensis*, Schmiedekn.); sexes, variety, &c., described at length: Arn., Hor. Ent. Ross. xix. pp. 282–285. Note on *A. apicata*, *morawitzi*, &c.; Ent. Nachr. xi. pp. 81–83.

New species:—

Augochlora camure, p. 213, *tupacamaru*, p. 214, Uruguay, Holm., An. Soc. Arg. xviii.

Ecplectica cucurbitæ, Am. mer., *id. t. c.* p. 204.

Camptopæum prinii, p. 210, *amargosi*, p. 211, Uruguay, *id. t. c.*

Cilissa nigra, Rhone Valley, Friese, Ent. Nachr. xi. p. 85.

Apides.

Schmiedeknecht (308A), pp. 899–976, completes his tabulation of species of *Osmia*, and gives detailed descriptions of 23 species.

The double rôle of the sting of the honey-bee; Psyche, iv. p. 251 (translated from the German).—A new *Bacillus* (*B. alvei*) is the cause of the *disease of the hive bee* hitherto known as foul brood; Cheshire, F. R., and Cheyne, W. W., J. R. Micr. Soc. (2) pp. 581–602.

Ein sehr lehrreiches Nest des *Bombus terrestris*, L.; Hoffer, Wien. ent. Z. iv. pp. 84–89.—Nests of *Bombus alticola*, *mendax*, and *pomorum* var. *mesomelas* described; *id.* Kosmos, xvi. p. 291.—Note on *Bombus gerstaeckeri*, Mor., dealing with differences of habit in the two sexes; Dalla Torre, Zool. Anz. viii. p. 691.—*Humble-bees* on the Pampas; Sci. Goss. xxi. p. 54.

Xylocopa violacea: organs of flight; Amans, Ann. Sci. Nat. xix. pp. 91–109, pl. viii. *X. coronata* (= *forbesii*, Kirb.); Rits., Notes Leyd. Mus. vii. p. 54.

Epeolus luctuosus, Evers., redescribed, p. 286, and laminæ genitales figured, pl. xii.; Arn., Hor. Ent. Ross. xix.

Radoszkowski describes and figures the copulatory organs of the males of numerous species of *Philérémides*; Bull. Mosc. lxi. pp. 359–371, pls. i. & ii.

Mouth and sting of *Melecta punctata*; J. Micr. & Nat. Sci. iv. p. 258, pl. xxii.

New species :—

Psaenythia bergii, Uruguay, Holm., An. Soc. Arg. xviii. p. 211.
Stelis frey-gessneri, Rhone Valley, Friese, Ent. Nachr. xi. p. 83.
Melissa chairuana, Uruguay, Holm., *t. c.* p. 205.
Caliopsys inconspicua, p. 206, *pirata*, p. 208, Uruguay, *id. t. c.*
Nomada parvula, Sicily, Pérez, Nat. Sicil. iv. p. 189.
Osmia maritima (? = *nigriventris*, Zett.), Rostock, Friese, Ent. Nachr. xi. p. 85.

Vespidæ.

Eumenes petiolatus var.: metamorphoses; Ann. Soc. Ent. Fr. (6) v. p. 219, pl. iv. *E. latreilli*, Sauss., nest (woodcut) and habits; *Abispa splendida*, Guér., nest (woodcut), p. 323; *Odynerus bicolor*, Sauss., and *Polistes bernardi*, Le Guil., p. 326, habits: noticed by Roth, J. L. S. xviii.

Note on a female *hornet* adopting and rearing the larvæ of a deserted nest; Ent. Nachr. xi. p. 218. *Vespa vulgaris*, note on nest of; Tr. Norw. Soc. iv. p. 50: on extraordinary large nest of; J B. westf. Ver. xiii. p. 21. *V. norvegica* and *V. sylvestris* cohabitants of one nest; P. E. Soc. 1885, p. ii.—Sting of wasp, structure of; J. Micr. & Nat. Sci. iv. p. 255, pl. xx.—*Synagris calida* figured at work, with nests; La Nature, xiii. 1, p. 24.

New species :—

Eumenes bispinosus, Dalmatia, Mor., Hor. Ent. Ross. xix. p. 135.
Pterochilus hellenicus, Greece, p. 137, *eckloni*, China, p. 139, *atrohirtus*, Greece, p. 142, *punctiventris*, Persia, p. 143, *aberrans*, Transcaucasus, p. 145, *id. t. c.*
Hoplomerus quadricolor, Transcaspian, p. 146, *persa*, p. 148, *mammillatus*, p. 149, Persia, *caroli*, Algeria, p. 151, *calcaratus*, Transcaucasus, p. 153, *congener*, Greece, p. 155, *armeniacus*, p. 157, *mandibularis*, p. 158, Transcaucasus, *grandis*, Persia, p. 159, *id. t. c.*
Lionotus nigricornis, Tauria, p. 160, *przewalskyi*, p. 161, *atrofasciatus*, p. 162, China, *tegularis*, p. 165, *cardinalis*, p. 167, *cribratus*, p. 171, Transcaucasus, *sulfuripes*, p. 169, Transcaspian, *sellatus*, Kirghese Desert, p. 172, *id. t. c.*
Ancistrocerus komarowi, Transcaspian, *id. t. c.* p. 175.
Microdynerus bifidus, Tauria, p. 177, *alastoroides*, Transcaucasus, p. 179, *id. t. c.*
Rhynchinum rothi, Queensland, Kirb., J. L. S. xviii. p. 324.

Crabronidæ.

[*Cf.* Kohl (169, 170), Mocsáry (222).]

The following synonymy is given, with full references, by Kohl, in Ent. Nachr. xi. pp. 161–166:—*Sapyga similis*, Fab., = (*S. rufipes*, Costa); *Pompilus* (*Larra*) *6-maculatus*, Spin., = (*venustus*, Wesm., = *fraterculus*, Costa); *Salius* (*Pompilus*) *tripunctatus*, Dahl., = (*P. funereipes*,

Costa); *P. bilunulatus*, Sauss., = (*semicinctus*, Tasch.); *P. aterrimus*, Rossi, ♂ var. = (*nigripennis*, Sich.); *P. scalaris*, Tasch., = (*representans* and *corruscus*, Sm.); *P. interruptus*, Say, = (*costatus*, Tasch., and *P. polistoides* and *flavopictus*, Sm.); *P. australis*, Guér., var. = (*aurifrons*, Sm.); *P. nigerrimus*, Scop.. var. = (*incisus*, Tisch.); *P. cinctellus*, v. d. L., var. = (*nubecula*, Costa); *P.* sp.? = (*ruficeps*, Sm., *nec* Evers.); *P. operculatus*, Kl., = (*vomeriventris*, Costa); *Priocnemis infumatus*, Costa, = (*sordidipennis*, Kohl); *P. propinquus*, Lep., = (*bellieri*, Sich.), and *P. propinquus*, Tasch., requires a new name; *Pompilus tripunctatus*, Spin., = (*elegans*, Spin., = *Prioc. variabilis* var. *formosa*, Costa). *Planiceps saussurei*, n. n. p. 164, = (*Aporus variipennis*, Sauss., *nec* Perty). *Pseudagenia hyalipennis*, Zett., = (*Agenia fallax*, Evers.). *Pompilus novaræ*, n. n. = (*Agenia nana*, Sauss.), and the characters given in note, p. 164. *Priocnemis tinctor*, Sauss., is a *Salius* of the *Hemipepsis* group. *Ammophila dives*, Br., = (*nigritaria*, Walk., and *festiva*, Sm.). *Sphex chrysis*, Christ., = (*Chlorion lobatum*, Fab.); *S. aurulentus*, Fab., = (*sericea*, Fab., *fabricii*, Dhlb., *ferruginea*, Lep., *lineola*, Lep., *ferox*, Sm., *lepeletierii*, Sauss., and *godeffroyi*, Sauss.); *S. lividocinctus* (*Enodia*), Costa, = (*isselii*, Grib.); *S. nigropectinatus*, Tasch., = (*Podium maracandicum*, Radosz.); *S. emarginatus*, Brullé, = (*argyrius*, Brullé, = *confinis*, Dhlb.). *Stigmus congruus*, Walk., = (*S. niger*, Motsch.).

Haploneurion, n. n. for *Haploneura*, Kohl (*nec Aploneura*, Pass.); *id. t. c.* p. 163.

Crossocerus pubescens, Shuck., = (*Crabro tischbeini*, Kirch., Cat. eur.); *Bembex tarsata*, Latr., var., = (*dissecta*, Dhlb.). [Reference lost.]

Pelopæus lætus and *Sphex ephippium*: habits noticed; Roth, J. L. S. xviii. pp. 318–321.

Pison spinolæ, Shuck., *perplexus*, Sm.: nests noticed; *id. t. c.* p. 321.

Bembex tridentifer, Sm.: nest underground; *id. t. c.* p. 321.

Pepsis pan, *hyalinipennis*, p. 240, *amyntas*, Amazons, *basalis*, p. 241, Colombia, *parthenope*, Brazil, p. 242, *pulchripennis*, p. 243, *erythroptera*, p. 244, *egregia*, p. 246, *insignis*, p. 248, Amazons, *jucunda*, Venezuela, *micans*, Colombia, p. 249, *albolimbata*, Brazil, *sciron*, p. 250, *fulgidipennis*, Amazons, *chlorotica*, p. 251, Brazil, *fulvicornis*, Panama, *hecuba*, p. 252, *amabilis*, *violaceipennis*, p. 253, *crassicornis*, p. 254, Amazons, *charon*, Panama, *violacea*, p. 255, *advena*, Am.-mer., *pallidicornis*, Amazons, p. 256, *hymenea*, Venezuela, p. 257, *nana*, Brazil, *sibylla*, Quito, p. 258, *frivaldszkyi*, p. 259, *diana*, *nyphe*, p. 260, *pulskyi*, p. 261, Amazons, *diversipennis*, p. 261, *aurimacula*, *chlorana*, Brazil, p. 262, *circe*, Venezuela, p. 263, *cinctipennis*, Guatemala, *sabina*, Venezuela, p. 265, *chiron*, Honduras, p. 266, *andréi*, Guatemala, *atalanta*, Colombia, p. 267, *hecate*, Amazons, *niobe*, Guiana, p. 268, Mocsáry, Term. füzetek, ix., spp. nn. von [illegible]

Salius elegans, Sicily, Pérez, Nat. Sicil. iv. p. 188, sp. n.

Sphex eximius, Soudan, p. 174, *hirtus*, Egypt, p. 176, *pollens*, Greece, p. 186, *nudatus*, Caucasus, &c., p. 187, *insignis*, Syria, p. 189, *muticus*, East. Asia, p. 199, *melanocnemis*, Brussa, p. 201, Kohl, Term. füzetek, ix., spp nn.

The following also are probably new:—*S. nigripes* (Smith), Asia, p. 197, *maurus* (Smith), Amboyna, p. 199, Kohl, *t. c.*

Tachytes dives, Uruguay, Holm., An. Soc. Arg. xviii. p. 220, sp. n.

Larrada burmeisterii, Uruguay, *id. t. c.* p. 221, sp. n.

Tachysphex adjunctus, Spain, p. 362, *helveticus*, France, &c., p. 374, Kohl, Verh. z.-b. Wien, xxxiv., spp. nn.

Palarus orientalis (? *interruptus*, Dahl.), Ceylon, *id. t. c.* p. 422, sp. n.

Astatus carbonarius, Corsica, *id. t. c.* p. 437, sp. n.

Bembex uruguayensis, Holm., An. Soc. Arg. xviii. p. 216, sp. n.

Crabro caramuru, Uruguay, *id. t. c.* p. 219, sp. n.

Mutillidæ.

Radoszkowski (263) describes and figures the sexual armature of the males of a large number of already known species of the family, as well as of the new forms mentioned below.

Mutilla maura, Fab., is a var. of *arenaria*, Fab.; Kohl, Ent. Nachr. xi. pp. 161–166.

Dasylabris, g. n., p. 28, to include many known species of *Mutilla* (15 are mentioned), and *D. sejugis*, Askhabad, p. 46, *mlokosewitzi*, Daghestan, p. 47, spp. nn.; Rad., Hor. Ent. Ross. xix.

Edrionotus, g. n., p. 33, for *M. littoralis* and 6 other known species of *Mutilla*; *id. t. c.*

Tricholabioides, g. n., p. 35, for *M. pedunculata*, Kl., and *T. asiaticus* (no locality), sp. n., p. 36, fig. 69; *id. t. c.*

Agama caucasica, Caucasus, p. 37, fig. 56, *komarovii*, p. 38, fig. 58, *askhabadensis*, fig. 59, *caspica*, fig. 70, p. 39, Askhabad, *kokpetica*, Kokpet-dagh, *id. t. c.*, spp. nn.

Mutilla saltensis, Caucasus, in nests of *Bombus insipidus*, p. 8, fig. 2, *duplex* (= *ghilianii*, Rad., olim), Caucasus, p. 12, fig. 5, *hymalajensis*, Himalayah, p. 13, fig. 9, *lezginica*, p. 16, fig. 12, *elongata*, Caucasus, p. 17, fig. 13, *caffra*, Caffraria, p. 20, fig. 18, *daghestanica* (= *rubrocincta* var. β γ, olim), Caucasus, p. 24, fig. 22, *trunconomalica*, Trunconomalia, p. 26, fig. 27, *luzonica*, Luzon, p. 27, fig. 28, *M. etzchmiadzini*, Etzch-miadzin, p. 45, *serta*, Orenburg, p. 46, *id. t. c.*, spp. nn.

Formicidæ.

[*Cf.* Forel (111, 112).]

°André, E. Les Fourmis. Paris: 1885, 12mo, 345 pp. [Popular; *cf.* Feuill. Nat. xv. p. 60.]

Schnetzler, J. B. Sur les propriétés antiseptique de l'acide formique. Arch. Sci. Nat. xi. pp. 5–14.

Monomorium pharaonis, L., en ny fiende till vår husro; Reuter, Öfv. Finsk. Vet. Soc. Förh. xxvi. pp. 1–21. Much general information as to this species, as well as an account of its appearance in Finland.

Riley, 4th Rep. U. S. Ent. Comm., notices several species of ants that attack the cotton-worm, pp. 89–94, and figures *Solenopsis geminata*, p. 91.

Ravages of *Atta cephalotes* in Brazil; Will., Z. wiss. Zool. xlii. p. 699.

Pogonomyrmex occidentalis. Note on its mounds; Am. Nat. xix. p. 305.

Formica rufonigra, Lowne, *Œcophylla virescens*, Fab., p. 327, *Ectatomma diminuta*, Sm., *Meranoplus dimidiatus*, Sm., p. 328. Habits noticed by Roth, J. L. S. xviii.

Classification of *Myrmicides* discussed, and four tribes accepted as valid; Forel, Bull. Soc. Vaud. xx. pp. 376 & 377.

Prenolepis. Mayr's tabulation criticized, and other errors corrected, by For., Bull. Soc. Vaud. xx. p. 349; *P. vividula*, Nyl., *vividula* i. sp. var. n. *guatemalensis*, *t. c.* p. 348.

Tetramorium auropunctatum, Rog., and the characters of genus noticed; *id. t. c.* p. 375.

Atta (*Acromyrmex*) *hystrix*, Latr., races and specific details discussed, p. 354; *lundii*, Guér, p. 356; *tardigrada*, st. n., *saussurei*, p. 358; tabulation of workers of the subgenus, pp. 361 & 362: *id. t. c.*

Solenopsis globulariæ, Sm., noticed; *id. t. c.* p. 376.

Glyptomyrmex, g. n., p. 365, for *G. dilaceratum*, Mexico, sp. n.; *id. t. c.*

Xenomyrmex, g. n., p. 369, for *X. stollii*, sp. n., Guatemala, p. 370; *id. t. c.*

Megalomyrmex, g. n., p. 371, for *M. leoninus*, sp. n., Colombia, p. 372; *id. t. c.*

Cyphomyrmex, characters of, noticed, p. 367; *C. steinheili*, Orizaba, p. 368, sp. n.: *id. t. c.*

Camponotus atriceps, Sm., *ustulatus*, *stercorarius*, *yankee*, stt. nn., p. 339; *C. abscisus*, Rog., worker, p. 341, *andrei*, Mexico, p. 343, sp. n., *coruscus*, Sm., var. *fulgens*, *senex*, Sm., st. n. *formiciformis*, Guatemala, p. 345, *sylvaticus*, Ol., st. n. *guatemalensis*, p. 346; *C. maccooki*, locality corrected (it is "the Mexican Island of Guadeloupe"), p. 347; *C. nitidus*, Nort., st. n. *montivagus*, Guatemala: *id. t. c.*

Dolichoderus mariæ, New Jersey, p. 349, *auromaculatus*, Brazil, p. 350, *id. t. c.*, spp. nn.

Iridomyrmex dispertitus, Guatemala, sp. n., *id. t. c.* p. 351.

Leptothorax stollii, Guatemala, sp. n., *id. ibid.*

Sericomyrmex aztecus, Orizaba, sp. n., *id. t. c.* p. 363.

Apterostigma pilosum, Mayr., st. n. *scutellare*, Mexico, *id. t. c.* p. 364.

Cremastogaster stollii, Guatemala, sp. n., p. 373, *sumichrasti*, Mayr, st. n. *surdior*, Guatemala, p. 375, *id. t. c.*

Pheidole jucunda, p. 179, *wood-masoni*, p. 180, E. India, *id.* J. A. S. B. liv. pt. 2, spp. nn.

Chrysididæ.

[*Cf.* Aaron (1).]

4 species of *Chrysis* reared from burrows of *Odynerus spinipes*; P. E. Soc. 1885, p. xix.

Cleptes provancheri, n. n. for *C. americana*, Prov.; Aar., Tr. Am. Ent. Soc. xii. p. 212. *C. insperata*, pl. vi. figs. 1 & 2, *speciosa*, N. America, *id. t. c.*, spp. nn.

Diplorrhos, g. n. of *Elampinæ*, for *D. plicatus*, sp. n., N. America, p. 216, fig. 18, Aar., *t. c.*

Omalus diversus, p. 213, fig. 4, *semicircularis*, p. 215, fig. 12, N. America, spp. nn., *id. t. c.*

Elampus cressoni, fig. 16, *variatus*, fig. 15, N. America, *id. t. c.* p. 215, spp. nn.

Notozus intermedius, *seminudus*, fig. 25, *nitidus*, *hyalinus*, p. 218, *productus*, fig. 23, p. 219, N. America, *id. t. c.*, spp. nn.

Holopyga horus, p. 220, fig. 35, N. America, sp. n., *id. t. c.*

Hedychrum continuum, p. 224, fig. 29, N. America, sp. n., *id. t. c.*

Chrysis inusitata, fig. 40, *optima*, fig. 39, p. 227, *cobaltina*, *lateridentata*, p. 228, *faceta*, p. 229, *discreta*, p. 230, fig. 45, *meta*, fig. 50, *dorsalis*, fig. 51, *montana*, fig. 52, p. 234, *hirsuta*; figs. 56 & 57, *pellucidula*, figs. 58 & 59, *pattoni*, fig. 60, p. 235, *inflata*, figs. 68 & 69, *nortoni*, figs. 70–73, *peracuta*, figs. 74 & 75, p. 237, *tripartita*, *propria*, figs. 76 & 77, p. 238, spp. nn., *id. t. c.*; *C. tota*, n. n. for *C. integra*, Norton, *nec* Fab., *id. t. c.* p. 228.

Ichneumonidæ.

[*Cf.* Cameron (124).]

Bridgman & Fitch continue their "Introductory papers on *Ichneumonidæ*," in Ent. xviii. pp. 13, &c.

Waterhouse, Aid, iii. pl. clxii., figures the following species of Smith: *Cryptus insidiator*, fig. 1, *Paniscus quadrilineatus*, fig. 2, *Ophion dentatus*, fig. 3, *albopictus*, fig. 4, *Campoplex longipes*, fig. 5.

Riley, Fourth Rep. U.S. Ent. Comm. pp. 111–114, figures *Pimpla conquisitor* and *annulipes* and *Cryptus nuncius*, as parasitic on *Aletia xylina*.

Ichneumon impressor, Zett., *gradarius*, Wesm., *molitorius*, L., and *Pimpla arctica*, Zett., reared from *Charæas graminis*; Ent. Tidskr. vi. pp. 169–175.

Ichneumonides.

Cameron, Biol. Centr. Am. *Hym.*, notices or figures *Ichneumon dilucidus*, Cresson, p. 145, *I. maculosus* (sub *Joppa*), Smith, pl. viii. fig. 6, *I. exquisitus*, Cresson, pl. vii. fig. 25, *aztecus*, Cress., p. 182, pl. viii. fig. 18, *conicus*, Brullé, p. 187, pl. viii. fig. 22, *Trogus blandita*, Cress., pl. ix. fig. 1, *pulchripennis*, Smith, pl. viii. fig. 25, *Joppa melanocephala*, Cam., pl. xi. fig. 4, *varipes*, Cam., fig. 9, p. 193, *elegantula*, Cress., *variolosa*, Smith, p. 19, *fumipennis*, Cress., p. 195, fig. 11, *melanostigma*, Cam., fig. 10, p. 195, *xanthostigma* and *maculicornis*, Cam., p. 196, *hilaris*, Smith, *nigriceps*, Cam., p. 197, fig. 5, *modesta*, Smith, fig. 8, *rogersi* and *xanthostoma*, Cam., fig. 6, p. 198, *geniculata*, Cam., p. 199, *sumichrasti*, Cress., p. 200, fig. 7, *Mesostenus admonitus*, *intrudens*, pl. x. fig. 16, p. 217.

Abzaria, g. n. of *Ichneumones Platyuri*, Wesm., p. 200, for *A. latipetiolaris*, Mexico, sp. n., *id. t. c.* p. 201, pl. ix. fig. 3.

Ichneumon vancouveriensis, Prov., Canad. Ent. xvii. p. 114; *I. bellicosus*, Sicily, Pérez, Nat. Sicil. iv. p. 186; *I. phædra*, *sycophantus*, pl. vii. fig. 8, *subfumatus*, p. 146, Guatemala, *laricens*, fig. 9, p. 147, Mexico, *verapacis*, p. 148, *subpinguis*, *eros*, fig. 14, Guatemala, p. 149, *carinifrons*, Mexico, Panama, *celatus*, fig. 13, Mexico, p. 150, *forreri*, fig. 15, p. 151,

jalapensis, *tumidulus*, fig. 12, p. 152, *curtituberculatus*, fig. 11, *maculipleuralis*, p. 153, *platyaspis*, *impudicatus*, p. 154, *consanguineus*, p. 155, Mexico, *salvini*, fig. 16, p. 155, *causticus*, p. 156, pl. viii. fig. 3, *godmani*, pl. vii. fig. 18, *melanopoda*, p. 157, Guatemala, *panamensis*, pl. viii. fig. 4, Panama, *lymphatus*, p. 158, pl. vii. fig. 19, *championi*, fig. 17, Guatemala, *numerosus*, fig. 10, p. 159, Mexico, *guatemalensis*, p. 160, Guatemala, *opiparus*, *tepidus*, p. 161, *sallæi*, p. 162, *illacessitus*, fig. 21, *turpiculus*, fig. 22, p. 163, *sublutus*, Mexico, *multiplagiatus*, pl. viii. fig. 5, p. 164, *suffrageneus*, fig. 13, p. 165, *truncatulentus*, fig. 12, Guatemala, p. 165, *opiniosus*, p 166, fig. 11, Mexico, *democraticus*, fig. 10, Guatemala, *calladolidensis*, fig. 9, p. 167, *yucatensis*, fig. 8, Mexico, *subscivus*, fig. 7, Guatemala, p. 168, *centralis*, fig. 15, p. 173, Costa Rica, *parsimonicus*, p. 174, fig. 23, *motivus*, p. 176, fig. 16, *beatus*, p. 177, fig. 17, Mexico, *piliventris*, p. 179, fig. 19, *notabilis*, p. 180, fig. 20, *ariel*, fig. 14, *blandicus*, p. 181, Guatemala, *orizabensis*, fig. 21, Mexico, p. 183, *marginiscutellatus*, p. 184, *fortispina*, fig. 24, p. 185, Guatemala, *fastidiosissimus*, p. 186, Panama, Cameron, Biol. Centr. Am. *Hym.*, spp. nn.

Œdicephalus glucidatus, Guatemala, p. 188, pl. viii. fig. 23, sp. n., *id. t. c.*

Trogus excellens, *ornaticornis*, pl. ix. fig. 2, Guatemala, p. 190, spp. nn., *id. t. c.*

Joppa chiriquensis, p. 199, *maculicollis*, p. 200, Panama, spp. nn., *id. t. c.*

Amblyteles rufus, Sicily, sp. n., Pérez, Nat. Sicil. iv. p. 186.

Phæogenes montanus, Sicily, sp. n., *id. t. c.* p. 187.

Ischnus minai, Sicily, sp. n., *id. ibid.*

Cryptides.

[*Cf.* Thomson (341).]

Cameron, Biol. Centr. Am. *Hym.*, figures or notices the following already known forms: *Cryptus bicolor*, Smith, p. 202, pl. ix. fig. 12, *xanthostigma*, Brullé, p. 207, fig. 14, *Joppidium fuscipenne*, Brullé (sub *Cryptus*), p. 211, *Mesostenus nigerrimus*, Smith, pl. x. fig. 20.

Cryptus corvbi, Regimb., to be assigned to *Macrocryptus*; Thoms., Ann. Soc. Ent. Fr. (6) v. p. 19.

New genus and species :—

Nyxeophilus; type, *Cryptus bimaculatus*, Grav., *id. t. c.* p. 18; *N. nigricornis*, France, sp. n., *id. ibid.*

Phygadeuon ripicola, Sweden, p. 19, *parvicauda*, p. 20, *varicornis*, p. 21, *heterogaster*, p. 22, France, *id. t. c.*; *P. semifumatus*, Mexico, *albicollis*, Panama, p. 212, *alpinus*, p. 213, *melanopoda*, p. 214, pl. x. fig. 22, Mexico, Cameron, Biol. Centr. Am. *Hym.*

Joppidium ruficolle, p. 210, pl. ix. fig. 16, Mexico, Guatemala, *cæruleipenne*, Panama, fig. 17, *yucatense*, fig. 18, Mexico, *id. t. c.*

Cryptus montezuma, *monticola*, *niralis*, p. 203, *argentifrons*, *sodalis*, p. 204, Mexico, *solabilis*, pl. ix. fig. 15, *unifasciatus*, p. 206, *hebetis*, fig. 13, Panama, *fraternans*, p. 208, Mexico, *guatemalensis*, p. 209, Guatemala, *id. t. c.*

Microcryptus ornaticeps, nigritulus, France, Thoms., Ann. Soc. Ent. Fr. (6) v. p. 23.

Hemiteles obliquus, p. 24, *liambus*, p. 25, *australis, trochanteratus*, p. 26, *hirticeps*, p. 27, *balteatus*, p. 28, *homocerus, fascicarpus*, p. 29, *liostylus*, p. 30, *rubrotinctus*, p. 31, *glyptonotus*, p. 32, France, *lissonotoides*, p. 30, Sweden, *id. t. c.*

Mesostenus pompiliformis, Guatemala, p. 214, *annulitarsis*, p. 215, pl. x. fig. 15. Panama, *vividus*, p. 216, fig. 18, Guatemala, *chiriquensis*, p 218, *brachygaster* (no locality), *lamentarius*, fig. 14, Panama, p. 219, *cerapacis*, Guatemala, *fraternans*, p. 220, *montezuma, ornatifrons*, fig. 17, p. 221, Mexico, *striatifrons*, p. 222, Brit. Honduras, *corpulentus, nigrispina*, Mexico, p. 223, *megapoda*, fig. 19, Guatemala, p. 224, *costaricensis*, fig. 13 (as *nicaraguensis, longipes*), Costa Rica, p. 225, *euryaspis*, Mexico, p. 226, *parvituberculatus*, fig. 21, Guatemala, p. 228, Cameron, Biol. Centr. Am. *Hym.*

Polycyrtus obtusispina, pl. x. fig. 1, p. 230, *collinus*, fig. 3, p. 231, *confirmatus*, fig. 3, Guatemala, *cruciatus*, fig. 4, Mexico, p. 232, *fulvofemoratus*, pls. ix. fig. 22, & x. fig. 5, Guatemala, p. 233, *montezuma*, fig. 6, Mexico, *canaliculatus*, fig. 7, p. 234, *blanditus*, pl. ix. fig. 21, p. 235, Guatemala, *chontalensis*, pl. x. fig. 8, Nicaragua, p. 236, *guatemalensis*, fig. 9, p. 237, *nigritibialis*, fig. 10, Panama, *fulvipes*, fig. 11, Guatemala, p. 238, *pallidibalteatus*, Mexico, p. 240, *id. t. c.*

Pezomachus numidicus, Algeria, Thoms., *t. c.* p. 32.

Ophionides.

Ophion adustus, Cent. Europe, sp. n., Hall, MT. schw. ent. Ges. vii. p. 200.

Limneria compacta, Vancouver, sp. n., Prov., Canad. Ent. xvii. p. 116.

Tryphonides.

Mesoleptus fasciatus, Vancouver, sp. n., *id. ibid.*

Pimplides.

Correspondence on habits of *Rhyssa lunator*; Bull. Brooklyn Soc. vii. p. 123.

Appearance in enormous numbers of the male of *Lissonota variabilis* at Dantzic; Brischke, Schr. Ges. Danz. (2) vi. p. 23.

Platysoma, g. n., near *Xylonomus* and *Odontomerus*, for *P. tibialis*, sp. n., Vancouver; Prov., Canad. Ent. xvii. p. 115.

Rhyssa clavula, New Zealand, sp. n., Colenso, Tr. N. Z. Inst. xvii. p. 158.

Lissonota multicolor, New Zealand, sp. n., *id. t. c.* p. 159.

Pimpla ragusæ, Sicily, sp. n., Pérez, Nat. Sicil. iv. p. 188.

Echthrus provancheri, Vancouver, sp. n., Prov., Canad. Ent. xvii. p. 116.

Braconidæ.

[*Cf.* Marshall (207).]

Microgaster glomeratus. Economical value of; Orm., Rep. viii. p. 12.

Apanteles glomeratus successfully introduced into North America; Riley, Rep. Ent. p. 323. *A. aletiæ* figured, p. 103; habits described, p. 108, app: Riley, 4th Rep. U. S. Ent. Comm.

Chelonus nitens. Both sexes described; Marshl., Tr. E. Soc. 1885, p. 134.

Pseudobolus, g. n., near *Spathius*, p. 246, for *P. pygmæus*, p. 247, fig. 46, sp. n., Brazil, Reinhard, Verh. z.-b. Wien, xxxv.

Bracon erythrostictus, p. 17, *exarator*, p. 26, *tornator*, p. 32, *fraudator*, p. 34, *epitriptus*, p. 35, *prætermissus*, p. 37, *otiosus*, p. 42, *degenerator*, p. 44, *barypus*, p. 47, spp. nn., Marshl., Tr. E. Soc. 1885.

Chelonus antillarum, W. Indies, p. 118, note, *carbonator*, p. 123, Britain and Spain, *speculator*, p. 126, *conulus*, p. 127, *decorus*, p. 128, *dispar*, p. 129, *catulus*, p. 132, *pusio*, p. 133, *secutor*, *latrunculus*, p. 138, *exilis*, p. 139, Britain, spp. nn., *id. t. c.*

Ascogaster ratzeburgii, Britain, p. 146, sp. n., *id. t. c.*

Apanteles salebrosus, p. 164, *ferrugineus*, p. 170, *bignelii*, p. 171, *limbatus*, p. 173, *rubecula*, p. 175, *geryonis*, p. 180, *zygænarum*, p. 181, *jucundus*, p. 182, *nothus*, p. 186, *lætus*, p. 189, *cultrator*, p. 192, *prætor*, p. 197, *naso*, p. 203, *sicarius*, p. 209, *abjectus*, p. 211, *caberæ*, p. 212, *lautellus*, p. 219, Britain, spp. nn., *id t. c.*

Microplitis dolens, p. 232, *borealis*, p. 237, Britain, spp. nn., *id. t. c.*

Microgaster scoticus, p. 251, *noricius*, p. 252, *hospes*, p. 257, *spretus*, p. 259, *politus*, p. 260, Britain, spp. nn., *id. t. c.*

Agathis anglica, p. 265, Britain, sp. n., *id. t. c.*

Earinus zonatus, p. 268, Britain, sp. n., *id. t. c.*

Helcon helveticus, Switzerland, sp. n., Hall, MT. schw. ent. Ges. vii. p. 201.

Phylax pacificus, *niger*, Vancouver, spp. nn., Prov., Canad. Ent. xvii. p. 117.

Evaniidæ.

[*Cf.* Schletterer (305).]

Gasteruption (*Fœnus*, auct.) *austriacum*, Austria, *distinguendum*, Cent. Eur., pl. xiv. figs. 14 & 15, p. 277, *græcum*, Epirus, p. 279, *kohlii*, Tyrol, p. 280, *læviceps*, Rhodes, *nitidum*, Calabria, p. 281, *thomsoni*, Sweden, p. 285, *tibiale*, Tyrol, p. 286, *tournieri* (no locality given, but probably Europe), p. 287, *caffrarium*, C. Good Hope, p. 289, *tenuicolle*, Mexico, p. 291, *brachyurum*, Tasmania, p. 293, *dubium*, Australia, p. 294, *latigenale*, fig. 5, Amboyna, p. 295, *longicolle*, Sydney, *malaicum*, Australia, p. 296, *novæ-hollandiæ*, p. 297, *peregrinum*, p. 298, Sydney, *rogenhoferi*, Swan River, p. 299, *steindachneri*, p. 300, *variegatum*, p. 301, Sydney, Schlet., Verh. z.-b. Wien. xxxv., spp. nn.

Chalcididæ.

[*Cf.* Ashmead (8), Howard (152), Mayr (213).]

Riley, 4th Rep. U. S. Ent. Comm. pp. 102–107, figures *Trichogramma pretiosa*, *Euplectrus comstockii*, and notices their biology and attacks on

Aletia xylina; and pp. 115 & 116, figures *Hexaplasta zigzag*, and records its parasitism on *Phora aletiæ*.

Smicra burmeisteri, Kirb., is from Rio Janeiro, not Argentine Rep., as previously stated; Kirb., Ann. N. H. (5) xv. p. 243.

Isosoma nigrum, Michigan, Cook, Am. Nat. xix. pp. 804–808, woodcuts, egg, larva, pupa, and perfect insect; *I. hordei*, *tritici*, and *grande* figured, Riley, Rural New-Yorker, xliv. p. 418.

Note on *Eupelmus allynii*, French, with figs.; *id.* P. U. S. Nat. Mus. viii. p. 418, pl. xxiii. figs. 3 & 4.

New genera and species :—

Tetrapus (*Agaonidæ*), Mayr, Verh. z.-b. Wien, xxxv. p. 184, for *T. americanus*, Brazil, sp. n., p. 188, figs. 12–19.

Crossogaster, p. 189, for *C. triformis*, Socotra, sp. n., p. 192, figs. 20–22; *id. t. c.*

Nannocerus, p. 195, for *N. biarticulatus*, Brazil, sp. n., p. 196, fig. 23, *id. t. c.*

Physothorax, p. 196, for *P. disciger*, p. 197, and *annuliger*, p. 198, Brazil, spp. nn.; *id. t. c.*

Critogaster, p. 199, for *C. singularis*, p. 200, fig. 24, *nitiventris*, fig. 25, *nuda*, p. 201, Brazil, spp. nn., *id. t. c.*

Ganosoma, p. 202, for *G. robustum*, figs. 26 & 27, *parallelum*, *attenuatum*, p. 204, Brazil, spp. nn., *id. t. c.*

Tetragonaspis, (g. n. ? ♀ of *Ganosoma*), p. 205, for *T. flavicollis*, p. 207, *gracilicornis*, fig. 28, *forticornis*, p. 208, *coriaria*, *brevicollis*, *punctata*, p. 209, Brazil, *testacea*, Java, p. 210, spp. nn., *id. t. c.*

Sycorycles, (g. n. ?, ? = *Sycoscapter*, Westd.), p. 211, for *S. patellaris*, p. 215, figs. 29 & 30, *simplex*, p. 216, figs. 31–33, Java, *coccothraustes*, p. 217, figs. 34–36, *truncatus*, p. 218, fig. 37, Socotra, spp. nn., *id. t. c.*

Trichaulus, near *Torymus*, for *T. versicolor*, Brazil, sp. n., p. 266, fig. 38, *id. t. c.*

Plesiostigma, p. 226, for *P. bicolor*, Brazil, p. 227, figs. 39 & 40, sp. n., *id. t. c.*

Heterandrium, p. 232, for *H. longipes*, *nudiventre*, figs. 41 & 42, *uni-annulatum*, figs. 43 & 44, p. 235, *bi-annulatum*, 13-*articulatum*, p. 237, Brazil, spp. nn., *id. t. c.*

Colyostichus, p. 237, for *C. longicaudis*, *brevicaudis*, p. 239, Brazil, spp. nn., *id. t. c.*

Goniogaster, p. 240, for *G. varicolor*, Java, p. 241, sp. n., *id. t. c.*

Aëpocerus, p. 241, for *A. excavatus*, p. 243, *emarginatus*, *simplex*, *flavomaculatus*, p. 244, *punctipennis*, *inflaticeps*, fig. 46, p. 245, Brazil, spp. nn., *id. t. c.*

Blastophaga (*Ceratosolen*) *appendiculata*, Java, p. 164, figs. 1 & 2, *occultiventris*, p. 167, Tropical Nile, *fusciceps* ?, Java, p. 167, fig. 3, *solmsi*, p. 168, figs. 4 & 5, *constricta*, p. 169, fig. 6, *bisulcata*, p. 170, *crassitarsus*, p. 171, fig. 7, Java; (*Blastophaga*, s. str.), *breviventris*, p. 172, figs. 8 & 9, E. India, *clavigera*, Java, p. 174, *socotrensis*, Socotra, p. 175, *quadraticeps*, Singapore, p. 176, *javana*, Java, p. 179, fig. 10, *brasiliensis*, p. 180,

bifossulata, Brazil, p. 181, fig. 11, *mayeri*, Island of Bally, p. 182, *quadrupes*, Java, p. 182, *id. t. c.*

Otitesella serrata, Socotra, p. 210, *id. t. c.*

Philotrypesis spinipes, p. 223, *bimaculata*, *minuta*, p. 224, Java, *id. t. c.*

Diomorus variabilis, Brazil, p. 228, *id. t. c.*

Decatoma longiramalis, p. 229, *æquiramulis*, *breviramulis*, p. 230, Brazil, *id. t. c.*; *D. flavicollis*, Florida, Ashm., Month. P. Am. Ent. Soc. p. xii.

Leucospis coxalis, Buenos Aires, Kirb., Ann. N. H. (5) xv. p. 243.

Smicra (?) *bergi*, Buenos Aires, *id. t. c.* p. 244; *S. vittata*, *hirtifemora*, *longipetiola*, Florida, Ashm., Month. P. Am. Ent. Soc. p. x.

Chalcis flavipes, Florida, *id. t. c.* p. xi.; *C. columbiana*, *tachinæ*, N. America, How., N. Am. Chalc. p. 8.

Spilochalcis missouriensis, *virens*, p. 6, *odontotæ*, p. 7, N. America, *id. op. cit.*; *S. odontotæ*, N. America, parasitic on *O. suturalis*, *id.* Ent. Am. i. p. 117.

Isosoma grande, N. America, Riley, Rep. Ent. 1884, pp. 357 & 358, pls. vii. figs. 2 & 3, & viii. figs. 3 & 4; also (sub nom. *I. tritici*), *t. c.* pp. 383–387.

Eurytoma obtusilobæ, Florida, Ashm., Month. P. Am. Ent. Soc. xii. p. xii.

Callimome lividus, *dryorhizoxeni*, *melanocerus*, *citriformis*, Florida, *id. t. c.* p. xiii.

Ormyrus dryorhizoxeni, *rosæ*, Florida, *id. t. c.* p. xiv.

Thoracantha floridana, Florida, *id.* Ent. Am. i. p. 96: amplified description; Month. P. Am. Ent. Soc. xii. p. xi.

Semiotellus ficigeræ, Florida, *id.* Month. P. Ent. Soc. xii. p. xvii.

Eupelmus hirtus, p. xiv., *mantis*, *conigeræ*, p. xv., Florida, *id. t. c.*

Encyrtus lachni, *schizoneuræ*, *albocinctus*, Florida, *id. t. c.* p. xvi.; *E. sublestus*, p. 12, *ensifer*, *fuscicornis*, p. 13, *puncticeps*, *trioziphagus*, p. 14, *solus*, *pachypsyllæ*, p. 15, *cecidomyiæ*, p. 16, N. America, How., N. Am. Chalc.

Comys albicoxa, Florida, Ashm., Month. P. Am. Ent. Soc. xii. p. 16.

Chiloneurus dubius, *dactylopii*, N. America, How., N. Am. Chalc. p. 17.

Bothriothorax virginiensis, *peculiaris*, N. America, *id. op. cit.* p. 20.

Copidosoma gelechiæ, p. 10, *vagum*, *celænæ*, p. 11, *intermedium*, p. 12, N. America, *id. op. cit.*

Aphycus brunneus, p. 17, *ceroplastis*, *maculipes*, p. 18, N. America, *id. op. cit.*

Psilophrys hyalinipennis, N. America, *id. op. cit.* p. 21.

Homalotylus obscurus, N. America, *id. op. cit.* p. 22.

Leptomastix dactylopii, N. America, *id. op. cit.* p. 23.

Coccophagus vicidus, p. 24, *flavifrons*, *kozbelei*, p. 25, N. America, *id. op. cit.*

Elasmus varius, p. 29, *nigripes*, *albicoxa*, *pullatus*, *tischeriæ*, p. 30, N. America, *id. op. cit.*

Pleurotropis phyllotretæ, N. America (reared from leaf-mines of *Phyllotreta zimmermanni*), Riley, Rep. Ent. 1884, p. 307.

Trichogramma odontotæ, N. America, parasitic on *O. suturalis*; How., Ent. Am. i. p. 117.

Derostenus primus, N. America, *id. ibid.*

Euplectrus leucotrophis, *platyhypenæ*, p. 26, *catocalæ*, *frontalis*, p. 27, N. America, *id.* N. Am. Chalc. ; *E. marginatus*, Florida, Ashm., Month. P. Am. Ent. Soc. xii. p. xviii.

Elachistus proteoteratis, p. 27, *cacœciæ*, *coxalis*, p. 28, N. America, How., N. Am. Chalc. ; *E. euplectri*, parasitic on *Euplectrus comstockii* in N. America, How., 4th Rep. U.S. ent. Comm., App. Note 33, p. 108.

Tetranemus floridanus, Florida, Ashm., Month. P. Am. Ent. Soc. xii. p. xviii.

Sympiezus uroplatæ, N. America, parasitic on *Odontota suturalis* ; How., Ent. Am. i. p. 117.

Tetrastichus lecanii, Florida, Ashm., Month. P. Am. Ent. Soc. xii. p. xix. ; *T. productus*, parasitic on Hessian-fly in Missouri, Riley, P. U. S. Nat. Mus. viii. p. 419, pl. xxiii. fig. 5.

Proctotrupidæ.

Note on *Platygaster herrickii*, Pack. ; *id. t. c.* p. 420, pl. xxiii. fig. 6.

Ceraphron destructor, Say, is referred to the genus *Merisus*, redescribed and figured; *id. t. c.* pp. 413-416, pl. xxiii. fig. 1. *Merisus (Hemoporus) subapterus*, parasitic on the Hessian-fly in Missouri, *id. t. c.* p. 416, pl. xxiii. fig. 2, sp. n.

Cynipidæ.

[*Cf.* Ashmead (6, 7).]

Account of the discoveries of Lichtenstein and others as to the development of *Cynipidæ*, &c. ; Reut., Öfv. Finsk. Vet. Soc. Förh. xxvi. pp. 223 *et seq.*

Cynips superfetationis. Biology ; Paszlavsky, Math. Nat. Ber. Ung. ii. p. 172, pl. vi.

Chilaspis nitida, Gir., and *löwii*, Wachtl, are alternate generations, pp. 321–323 ; also *Neuroterus aprilinus*, Gir., and *schlechtendali*, Mayr., pp. 323 & 324 ; note on identity of *Xestophanes brevitarsis*, Th., and *tormentillæ*, Schlecht. ; note on *Aulax hieracii*, Bouché, and on galls of *Cynipidæ* on *Hypochæris radiata*, Lin., p. 326. Löw, Verh. z.-b. Wien, xxxiv.

Problematical occurrence of a species of *Biorhiza* in galls on roots of *Vitis vinifera* ; Bull. Ent. Ital. 1885, p. 207.

New species :—

Ceroptres obtusilobæ, *citriformis*, *pomiformis*, *virentis*, *succinipedis*, p. 300, *lanigeræ*, *minutissimi*, *catesbæi*, p. 301, N. America, Ashm., Tr. Am. Ent. Soc. xii.

Synergus ficigeræ, *conifera*, *batatoides*, p. 301, *bicolor*, *medullæ*, p. 302, N. America, *id. t. c.*

Cynips quercus-ficigera, *quercus-omnivora*, p. vi., *quercus-minutissima*, *quercus-fuliginosa*, p. vii., *quercus-medullæ*, p. viii., *quercus-gemmaria*, *quercus-capsuala*, p. ix., *id.* Month. P. Am. Ent. Soc. xii.

Andricus xanthopsis, Halle, Schlecht., JB. Ver. Zwickau, 1883, p. 1,

pl. i. fig. 1; *A. quercifoliæ, quinque septum*, N. America, Ashm., Tr. Am. Ent. Soc. xii. p. 299.

Amphibolips melanocera, N. America, *id. t. c.* p. 299.

Sapholytus gemmariæ, N. America, *id. t. c.* p. 302.

Allotria lachni, N. America, *id. ibid.*

Kleidotoma vagabunda, N. America, *id. ibid.*

Siricidæ.

Sirex gigas, L. Organs of flight; Amans, Ann. Sci. Nat. (6) xix. pp. 73–91.

Tenthredinidæ.

[*Cf.* Brischke (44), Cameron (62, 64), Konow (171), Kriechbaumer (179), Stein (331).]

Parthenogenesis in *Tenthredinidæ*, summary of recent additions to knowledge of; Cam., Mon. Brit. Phyt. Hym. ii. pp. 217–219.

Note on the spinning-glands of *Tenthredinidæ*; Poletajew, Zool. Anz. viii. p. 22.

"Sawflies": Harrington, Rep. E. Soc. Ont. xv. pp. 63–72, woodcuts; information as to various Canadian species.

Wüstnei, W. Die bisher in Schleswig-Holstein aufgefundenen Blattwespen (*Tenthredinidæ*). Schr. Ver. Schlesw. vi. pp. 19–52.

Wheat and grass sawfly (no other name, ? *Dolerus*), natural history of; Riley, Rep. Ent. 1884, pp. 387–389.

Cimbicinæ.

Cimbex americana. Injuries and metamorphoses, &c.; *id. t. c.* pp. 334–336, pl. v. figs. 1 *a–k*.

Hylotominæ.

Hylotoma hartigi (= *violacea*, Htg., *nec* Klug), sp. n., Europe, Konow, Wien. ent. Z. iv. p. 117. *H. fumipennis*, Sm., figured; Waterh., Aid, iii. pl. clvi. fig. 2. *H. enodis*, L., ♂, *anescens*, Först., *confusa*, Dietr., discussed; Kriechb., CB. Ver. Regensb. xxxix. pp. 145–148.

Nematinæ and *Lophyrinæ.*

Stein describes at length larvæ of *Nematus albipennis*, Hrtg., p. 302, *puncticeps*, Th., p. 303; Wien. ent. Z. iv.

Epitactus præcox, Frst., is probably an abnormal *Nematus capreæ*, pp. 9 & 20; and *N. brachycercus*, Htg., is probably *N. capreæ*; note on *Nematus crassus*, Ill., *sulcipes* & *cæruleocarpus*, Htg., p. 12; and discussion of synonymy of other *Nemati*, pp. 14–20: Kriechb., CB. Ver. Regensb. xxxix.

Dineura stilata, Klug: variation in the neuration of wings of this and other *Tenthredinidæ*; P. N. H. Soc. Glasg. (n.s.) i. p. v.

Nematus ribesii, ravages and remedies; Orm., Rep. viii. p. 32: *Lophyrus pini*, *id.* p. 73. *N. histrio*, variation discussed; Brischke, Schr. Ges.

Danz. (2) vi. p. 241. *N. erichsonii*, Hart., appearance and ravages in Canada; Rep. E. Soc. Ont. xv. pp. 72–77.

Euura: on the habits of species of; Cameron, P. N. H. Soc. Glasg. (n.s.) i. pp. 38–41.

New genus and species:—

Pseudodineura, for *D. parvula*, Klg., *mentiens*, Th., *despecta*, Htg., and ? *hepaticæ*, Brischke; Konow, Wien. ent. Z. iv. p. 297.

Dineura sulcifrons, Europe, Konow, *l. c.* p. 296.

Nematus nigricollis, p. 66, pls. ix. fig. 5, & xv. fig. 7, *fraternus* (= *lætus*, Cam., olim), p. 73, pl. iv. fig. 1, *astutus* (? same as *carinatus*, Htg.), p. 77, pl. xviii. fig. 3, *curticornis*, p. 202, pl. xxvi. fig. 6, Cam., Mon. Brit. Phyt. Hym. ii.; *N. lateralis*, Dantzic, Brischke, Schr. Ges. Danz. (2) vi. p. 246, pl. i. fig. 3 (larva); *N. wüstnei* (= *puncticeps*, Zad., = *puncticeps* var., Th.), sp. n., Europe, Stein, Wien. ent. Z. iv. p. 304.

Euura flavipes, p. 211, *nigritarsis*, p. 212, Scotland, Cam., Mon. Brit. Phyt. Hym. ii.

Selandriinæ, Phyllotominæ, Emphytinæ, Dolerinæ, and *Athalinæ*.

Hoplocampa ferruginea very destructive to plum trees in France; Lucas, Bull. Soc. Ent. Fr. (6) v. p. lxvii.

Monophadnus iridis, Kalt.: larva described; Gad. de K., Bull. Soc. Rouen, 1884, p. 380.

Konow, F. W. Ueber die Blattwespen-Gattungen *Strongylogaster*, Dahlb., und *Selandria*, Klg. Wien. ent. Z. iv. pp. 19–26.

Consists of tabulation of the genera and species, with descriptions of six new species and two new genera.

Selandria barda, Say: life history, etc; Osborn, Rep. E. Soc. Ont. xv. pp. 32–34. *S. rubi*: note on, with cut; Canad. Ent. xvii. p. 1. *S. aperta*, Hrtg.: larva described; Stein, Wien. ent. Z. iv. p. 248, figs. in text.

Dolerus. The characters of certain difficult species, and synonymy discussed at length, their differentiation rectified; *D. taeniatus*, Zadd., description of both sexes; *D. niteus*, Zadd. (= *anthracinus*, Htg., ♂, = ? *coracinus*, Htg., ♀); *D. anthracinus*, Klg. (= *atricapillus*, Htg., Zadd.); *D. coracinus*, Klg. (= *cærulescens*, Htg., ♂, = *anthracinus*, Zadd., ♂); *D. uliginosus*, Klg. (= *lateritius*, Klg., = *madidus*, Knw.); *D. madidus*, Klg. (= *lamprechti*, Knw.): Konow, Wien. ent. Z. iv. pp. 118–121.

Athalia maritima, Kby., figured; Waterh., Aid, iii. pl. clvi. fig. 1.

New genera and species:—

Thrinax, for *Selandria contigua* (n. n. for *mixta*, Th.), *mixta*, Kl. (= *femoralis*, Cam.), *macula*, Kl., and *T. intermedia*, sp. n., without locality; Kon., Wien. ent. Z. iv. pp. 22 & 23.

Stromboceros, near *Strongylogaster*, for *S. albilabris*, *gracilicornis*, *tibialis*, Corfu, spp. nn.; *id. l. c.*

Selandria excisa, p. 24, *furstenbergensis*, p. 25, without locality, *id. l. c.*

Fenusa quercus, Cent. Eng., Cam., Mon. Brit. Phyt. Hym. p. 222; *F. excisa*, and sp. ♀, Cent. Europe, Kon., *l. c.* p. 298.

Pœcilosoma undulata, Cent. Europe, *id. t. c.* p. 122.

Strongylogaster caucasicus, Stauropol, Schap, Ent. Nachr. xi. p. 181.

Dolerus steini, Helvetia, Kon., *t. c.* p. 301.

Tenthredininæ.

Allantus simillimus, terminalis, providus, multicolor, Macrophya opposita, Tenthredo simulata, Smith, figured; Waterh., Aid, iii. pl. clvi. figs. 3–8.

Rhogogaster to be replaced by *Rhogogastera*; Kon., Wien. ent. Z. iv. p. 123.

Larva of *Tenthredo rufipes*, Klg., described, confirming the species as distinct; Stein, Wien. ent. Z. iv. p. 245. *T. fuliginosus* and allies discussed; Kriechb., CB. Ver. Regensb. xxxix. pp. 135–143.

Allantus distinguendus, Germany, sp. n., Stein, Ent. Nachr. xi. p. 117.

Perineura crippæ, Sicily, sp. n., Pérez, Nat. Sicil. iv. p. 185.

Synairoma americana, Canada, sp. n., Prov., Canad. Ent. xvii. p. 50.

(c.) *LEPIDOPTERA.*

[*Cf.* Baker (13), Butler (51, 54, 55), Dalla Torre (87), Godman (123), Haase (133), Mabille (200), Möschler (225), Oppenheim (234), Pabst (238), Pryer (258), Röber (286), Romanoff (292), Rosenstock (293), Sandberg (296, 297), Schmid (306), Smith (321, 322), Snellen (323), Sorhagen (326, 327), Speyer (328), Swinhoe (335, 336, 337), Walker (349), Walsingham (350), Walter (353), Waterhouse (354), Weymer (361).]

Organs of flight of *Lepidoptera* ; Amans, Ann. Sci. Nat. xix. pp. 128–146, pl. vi.

Food-plants of *Lepidoptera*; Beuttenmüller, Papilio, iv. pp. 155–157.

Lepidoptera attracted to trees infested by Aphides; Canad. Ent. xvii. p. 80.

Hübnerian! by John B. Smith ; Papilio, iv. pp. 183–185. Discusses briefly the value of Hübner's classifications and nomenclature.

List of insects bred and exhibited in Zoological Gardens, Lond. ; P. Z. S. 1885, p. 65.

RHOPALOCERA.

[*Cf.* Butler (53), Distant (91), Forbes (110), Godman & Salvin (124), Honrath (143), Kane (160), Kirsch (168), Mathew (211, 212), Nicéville (227, 228, 229), Plötz (252), Schilde (301, 302), Smith (317), Srnka (329), Staudinger (330), Tetens (339).]

"Protective resemblance in insects :" hind part of butterfly mimicking the front part in order to direct attacks to the less vital part. Antananarivo Annual, No. ix. p. 119.

Seasonal variation in *Rhopalocera* ; Ent. M. M. xxii. p. 131.

List of a collection of Diurnal *Lepidoptera* from S. Texas, by E. M. & S. F. Aaron, Papilio, iv. pp. 172–182. This contains many remarks of general interest, as well as descriptions of two new species. Owing to its bearing the date 1884 it is not mentioned in our faunistic record.

Snellen gives identifications of about 24 species figured in Rösel's Insectenbelustigung ; Tijdschr. Ent. xxviii. p. 204.

Snellen, in Tijdschr. Ent. xxviii. pp. 37 & 38, gives the following nomenclatorial alterations as to Celebes *Rhopalocera* described by him, *op. cit.* xxi. 1877–78, viz. : *Danais juventa* is *ishma*, Butl., which, however, is only a var. of *juventa* ; *Euripus halitherses* is rather *robustus*, Wall. ; *Apatura parisatis* is rather *macar*, Wall. ; *Pamphila marnas* is *sunias*, Feld.

Papilionidæ.

The following species are figured by Distant, Rhop. Mal. :—*Ornithoptera rhadamanthus*, pl. xxvii. fig. 5, *hephæstus*, figs. 2–4, *ruficollis*, pl. xxvii.*a*,

fig. 1, *brookeana*, pls. xxvii. *b*, fig. 1, & xxvii. *a*, fig. 4; *Papilio erebus*, pl. xxxi. figs. 1 & 2, *varuna*, figs. 3 & 4, *neptunus*, pl. xxxiii. figs. 5 & 6, *doubledayi*, pl. xxxiii. fig. 4, *aristolochiæ*, var. *diphilus*, pl. xxxi. figs. 6 & 7, *brama*, pl. xxxii. fig. 4, *agenor*, pl. xxix. fig. 1, *esperi*, pl. xxviii. figs. 1 & 6, *nestor*, figs. 2 & 7, *achates*, pl. xxviii. figs. 3–5, *helenus*, pl. xxix. fig. 3, *iswara*, pl. xxx. figs. 1 & 2, *prexaspes*, pl. xxix. fig. 2, *nephelus* var. *saturnus*, pl. xxx. figs. 3–5, *demolion*, pl. xxvii. fig. 3, *erythonius* var. *malayanus*, fig. 6, *butleri*, pl. xxvii. *a*, fig. 6, *caunus* var. *agialus*, pl. xxvii. *b*, fig. 5, *clytia*, fig. 2, *onpape*, pl. xxvii. fig. 5, *delessertii*, pl. xxvii. *b*, fig. 4, *leucothoe*, pl. xxvii *a*, figs. 2 & 3, *antipathes* var. *pompilius*, pl. xxxi. fig. 5, *sarpedon*, pl. xxxii. fig. 6, *eremon*, fig. 1, *bathycles*, fig. 2, *arycles*, fig. 5, *agamemnon*, fig. 7.

Ornithoptera tithonus, ♀ described; C. Oberth., Bull. Soc. Ent. Fr. (6) v. p. cxxii.

Papilio machaon, L.: Scandinavian *aberration*, Ent. Tidskr. vi. pp. 139 & 214; aberration of, Ent. Nachr. xi. p. 123. *P. schmeltzi*, life-history, with figs. of larva and pupa; Math., Tr. E. Soc. 1885, p. 357, pl. x. figs. 1 & 2. *P. godeffroyi*, *id.*; *id. t. c.* p. 361, figs. 3 & 4. *P. alcidinus*, Butl., noticed and figured; Röb., CB. Iris, p. 30, pl. i. fig. 1. *Laertias pammon*, larva, &c., noticed; Swinh., P. Z. S. 1885, p. 145. *P. forbesi* redescribed; Forbes, Naturalist's Wanderings, p. 275. Correction of Gruber's description of larva of *P. ajax*; Papilio, iv. p. 188 [translation from Jen. Z. Nat.]. *P. zolicaon*, Boisd.: preparatory stages described; Edw., Papilio, iv. pp. 162–166.

Parnassius actius, *rhodius*, and *jacquemontii*: note on differential characters of; Honr., B. E. Z. xxix. pp. 274 & 275. *P. apollo* var. approximating to *P. mnemosyne* figured; JH. Ver. Württ. xli. pl. vi. fig. 2. *P. smintheus* and *P. clodius*: preparatory stages described; Edw., Canad. Ent. xvii. p. 61.

New species and varieties:—

Ornithoptera riedeli, Timor Laut, Kirsch, P. Z. S. 1885, p. 275, pl. xix. figs. 1 & 2; *O. haliphron* var. n. *bauermanni*, and larva, Ins. Kabia (Celebes), Röb., CB. Iris, p. 19.

Papilio brontes, Kilima-njaro, Godman, P. Z. S. 1885, p. 540; *P. albolineatus*, Forbes, p. 275, *itamputi*, Butl., p. 276, Sumatra, Forbes Naturalist's Wanderings; *P. sycorax*, Sumatra, Smith, Ent. M. M. xxi. p. 247; *P. uranus*, Nias I., Weym., S. E. Z. xlvi. p. 271; *P. danisepa*, p. 343, *cacharensis*, p. 344, Assam, Butl., Ann. N. H. (5) xvi.; *P.* (*Zetides*) *acheron*, Bengal, Moore, Ann. N. H. (5) xvi. p. 120; *P. phœnix* (? *agenor* var. ♀), pl. xxvii. fig. 7, *cilix* (? *agenor* var.), pl. xxix. figs. 4 & 5, p. 340, *mecisteus* (= *axion*, Butl., *nec* Feld.), p. 361, woodcut, Malay Penins., Dist., Rhop. Mal.; *P. nezahualcoyotl*, New Mexico, p. 174, *cleombrotus*, Amaz. sup., p. 175, Streck., P. Ac. Philad. 1885; *P. albinus* var. n. *sekarensis*, New Guinea, Honr., B. E. Z. xxix. p. 275; *P. caunus* noticed, and var. *velutinus* from Sumatra named, Butl., Ann. N. H. (5) xvi. p. 343; *P. cyprœafila* var. n. *mechowiana*, Angola, Ent. Nachr. xi. p. 305, woodcut; *P. isodorus* var. n. *leucostictus*, Colombia, Honr., B. E. Z. xxix. p. 275.

Parnassius bremeri var. n. *graeseri*, Siberia, Honr., B. E. Z. p. 272, pl. viii figs. 1, 1*b*, & 1*c*; *P. nordmanni* var. n. *minima*, Daghestan, *id. t. c.* p. 273, pl. viii. figs. 2 & 2*a*; *P. mnemosyne* ab. nov. ♀ *melaina*, Carinthia, *id. t. c.* p. 273; *P. stubendorfii*, ab. nov. ♀ *melanophia*, E. Siberia, *id. t. c.* p. 274.

Calinaga brahma, Assam, Butl., Ann. N. H. (5) xvi. p. 309.

Pieridæ.

Distant, Rhop. Mal., figures the following previously known *Pierinæ*:—*Leptosia xiphia*, Fab., pl. xxvi. fig. 8, *Catopsilia crocale*, pl. xxv. figs. 11 & 12, *catilla*, figs. 15 & 16, *chryseis*, pls. xxv. figs. 1 & 2, & xxvi. fig. 20, var.; *Udaiana cynis*, pl. xxvi. figs. 5 & 6, *Terias tilaha*, pl. xxv. fig. 8, *hecabe*, pl. xxvi. figs. 19, 15, & 11, *sari*, pls. xxv. fig. 3, & xxvi. figs. 3 & 7, *vallivolans*, pl. xxvi. fig. 17, *pumilaris*, pl. xxvi. fig. 1, *senna*, pls. xxvi. fig. 13, & xxv. fig. 14, *harina*, pl. xxv. fig. 13, *Dercas gobrias*, pl. xxvi. fig. 18, *Ixias birdi*, pl. xxvi. fig. 4, *Appias hippo*, pl. xxv. figs. 4 & 5, *leis*, pl. xxv. figs. 7, 6, & 10, *leptis* var. *plana*, pl. xxv. fig. 9, *Saletara nathalia*, pl. xxvi. figs. 1 & 2, *Hebomoia glaucippe*, pl. xxvi. fig. 9, *Nepheronia lutescens*, pl. xxvi. fig. 14, *hippia* var. *gæa*, pl. xxvi. figs. 16 & 12.

♂ secondary sexual character noticed in *Terias hecabe*, L., group, and *T. laeta* group; *Huphina hira*, Moore, probably winter form of *H. phryne*, p. 50; *Hiposcritia imbecilis*, Moore, doubtfully distinct from *H. indra*: Nicév., J. A. S. B. liv. ii.

Colias fieldii, Men., *Terias venata*, Moore, Distant's remarks on *Terias mandarina*, &c., *Delias ithiela*, Butl., *Appias vacans*, Butl., *Hiposcritia shiva*, Swinh., *H. mahana*, Moore, noticed by Butl., Ann. N. H. (5) xvi. pp. 336–342.

Our white butterflies in Japan; Sci. Goss. xxi. p. 86.

Nepheronia arabica, Hopf., and cognate forms, noticed; Butl., P. Z. S. 1884. p. 492. *N. hippia* and *gæa* noticed; Swinhoe, P. Z. S. 1885, p. 139.

Note on *Eucheira socialis*, West., with figs. of metamorphoses; Nat. Mex. vii p. 152, pl. i.

Pieris rapæ increasing in Nebraska, but checked by fossorial *Hymenoptera*; Riley, Rep. Ent. 1884, p. 400. *Ganoris rapæ* (= *P. mannii*, Mayer); Swinh., Tr. E. Soc. 1885, p. 343. *P. napi*, L., gen. ii., *napææ*, Esp., ab. *sulphurea*, Scandinavia; Ent. Tidskr. vi. pp. 140 & 214. *P. iranica*, Bien., figured; Rom. Mem. ii. pl. xii. figs. 1*a–c*.

Terias hecabeoides and *æsiope* seen coupled; Swinh., P. Z. S. 1885, p. 136.

Huphina zeuxippe and *cassida* noticed; *id. t. c.* p. 137.

Delias eucharis: larva and pupa noticed; *id. t. c.* p. 139. *D. horsfieldii*, Gray, is distinct from *belladonna*, Fab.; Butl., Ann. N. H. (5) xv. p. 57.

Gonepteryx rhamni var. resembling *G. cleopatra*, at Aldershot; P. E. Soc. 1885, p. xxiv. *G. rhamni* and *farinosa*, scales of; Tetens, B. E. Z. xxix. p. 161, pl. vii. *G. nepalensis*: differential characters; Butl., Ann. N. H. (5) xv. p. 406.

Colias. On some historical errors; W. H. Edwards, Papilio, iv. pp. 167–171: relates to some controversies about certain species of *Colias*. *C. aurorina* var. *libanotica*, Led., aberrations, pl. xii. fig. 2: figured; Chr., Rom. Mem. ii. p. 201. *C. sareptensis* and varieties of *C. hyale*, note on; Swinh., Tr. E. Soc. 1885, p. 344. *C. eurydice*: variation in California; Canad. Ent. xvii. p. 109. *C.*, ? hybrid of *edusa* and *hyale*; P. E. Soc. 1885, p. xxvi.

Callidryas eubule and *senna* are one species; Papilio, iv. pp. 172 & 173.

Catopsilia: note on the sexes and indistinctness of species of, at Aden; Butl., P. Z. S. 1884, pp. 485 & 486.

Kricogonia lyside, Godt., variation of, and *K. fantasia*, noticed; Aaron, Papilio, iv. p. 174.

Teracolus. Notes on the species found at Aden; some of the species are treated as doubtfully distinct; 14 in all are noted or commented on; Butl., P. Z. S. 1884, pp. 487–491. Note on *T. dulcis* (= *derus* = *eboreoides* = *phanius*, Butl.), with list of other species and remarks; Swinh., P. Z. S. 1884, pp. 509 *et seq.* *T. pseudeuanthe*, *eucharis*, *tilea*, probably seasonal varieties; Swinh., P. Z. S. 1885, p. 144.

New genera and species:—

Udaiana, pp. 286 & 300, for *Pieris cynis*, Hew.; Dist., Rhop. Mal.

Saletara, pp. 287 & 316, for *P. nathalia*, Feld., and *P. panda*, God.; *id. t. c.*

Terias heliophila, Assam, Butl., Ann. N. H. (5) xvi. p. 338, pl. viii. fig. 2.

Pieris kuhni, Ins. Kabia (Celebes), Röb., CB. Iris, p. 20, pl. i. figs. 2 & 3; *P. selma*, Nias I., Weym., S. E. Z. xlvi. p. 269, pl. ii. fig. 5.

Appias ares, Poona, Swinh., P. Z. S. 1885, p. 138; *A. andersoni*, Perak, Dist., Ent. xviii. p. 146.

Hiposcritia argyridina, Manipur, Butl., Ann. N. H. (5) xvi. p. 340; *H. shiva*, India, Swinh., P. Z. S. 1885, p. 138, pl. ix. figs. 1 & 2.

Huphina pallida, India, *id. t. c.* p. 137.

Belenois leucogyne, Aden, Butl., P. Z. S. 1884, p. 492.

Delias hearseyi, Barrackpore, *boyleæ*, Darjiling, Butl., Ann. N. H. (5) xv. p. 58.

Catopsilia heera, India, Swinh., P. Z. S. 1885, p. 140.

Delchina thermodusa, India, *id. t. c.* p. 146.

Colias christophi, p. 220, note, *C. romanovi*, p. 229, note, Alai Valley, Grm.-Grsh., Rom. Mém. ii.; *C. elis*, Kicking-horse Pass, Streck., P. Ac. Philad. 1885, p. 24.

Gonepteryx carnipennis, N.W. India, *maxima*, Japan, China, p. 407, *antonia*, Syria, p. 408, Butl., Ann. N. H. (5) xv.

Ixias meridionalis, p. 140, pl. ix. fig. 5, *cumballa*, p. 141, figs. 13 & 14, *coʻaba*, fig. 6, *jhoda*, figs. 3 & 4, p. 142, Swinh., P. Z. S. 1885; *I. flavipennis*, Sumatra, Smith, in Forbes's Naturalist's Wanderings, p. 275.

Idmais castalis, *cenosa*, Madagascar, Stgr., Exot. Schmett. p. 43, pl. xxiii.

Teracolus swinhoei, Aden, Butl., P. Z. S. 1884, p. 491.

Anthocharis pechi, Algeria, Baker, Ent. M. M. xxi. p. 241 ; *A. pechi*, Algeria, Stgr., Ent. Nachr. xi. p. 10.

Callosune hildebrandti, p. 44, *vulnerata*, p. 46, E. Africa, *haevernicki*, p. 45, and pl. xxiii., Stgr., Exot Schmett.

Danaidæ.

Danais (*Limnas*) *alcippoides*, Moore, not distinct from *D. chrysippus*, p. 40 ; *Euplœa core*, Cr., and *kollari*, Feld., noticed, p. 41 : Nicév., J. A. S. B. liv. ii. *D. claeippus* figured, pl. ii. fig. 1, noticed, p. 258 ; Weymer, S. E. Z. xlvi. *D. archippus* abundant in E. Canada ; Canad. Ent. xvii. p. 179. *D. borneensis*, name proposed for *D. eryx*, Fab. ? ; Stgr., Exot. Schmett. p. 49 : the insect figured, pl. xxiv., *id. t. c.*

Limnas, geographical distribution of the forms of ; Butl., P. Z. S. 1884, p. 478, pl. xlvi. Species having a different distribution, and meeting at one place (Aden), intermarry and produce intermediate forms ; also note on varieties : Swinh., *t. c.* p. 504, and 1885, p. 125.

Euplœa eupator; Hew., note on, p. 283; *E. stolli*, n. n. for *E. ochsenheimeri*, Moore, p. 258 : Weym., S. E. Z. xlvi.

Crastia core var. (= *Euplœa vermiculata*, Butl.) ; Swinh., P. Z. S. 1885, p. 126. *Pademma kollari*, extreme resemblance of, to *Crastia core* ; *id. ibid.*

Athesis hewitsonii, n. n. for *A.* (*Dircenna*) *dercyllidas*, ♂, Hew. ; with description of *dercyllidas* ♂ ver. : Srnka, B. E. Z. xxix. p. 121.

Ituna lamirus var. *completa* ; Stgr., Exot. Schmett. p. 56, pl. xxvii.

Aeria elodina, provisional name for an insect from Venezuela ; *id. t. c* p. 70.

Athyrtis salvini, ♂ figured, pl. i. fig. 1 ; *A. mechanitis* var. n. *oberthuri*, Ecuador, ♂, fig. 2 : Srnka, B. E. Z. xxix. p. 129.

Tithorea bonplandii varr. *descandollesi*, *latreillei*, and *flavomaculata* described ; Stgr., Exot. Schmett. p. 72.

New species :—

Euplœa bauermanni, Ins. Kabia (Celebes), Röb., CB. Iris, p. [illegible]noval of t[illegible] fig. 4 ; *E. kheili*, p. 259, pl. i. fig. 4, *maaseni*, p. 260, fig. [illegible] Weym., S. E. Z. xlvi. ; *E. plateni* (? = *inæqualis*, Butl.), [illegible] p. 52, *eichhorni*, N. Australia, p. 53, and figured, pl. xxvi., Stgr., Exot. Schmett.

Thyridia singularis, Bahia, *id. t. c.* p. 56, pl. xxvii.

Dircenna steinheili, Antioquia, *id. t. c.* p. 58, pl. xxvii.

Epithomia valera, Venezuela, *id. ibid.*, pl. xxvii.

Ithomia honrathi, Chancamayo, p. 125, pl. i. fig. 4, *trombona*, p. 126, fig. 6, *tenera*, p. 128, fig. 8, Up. Amazons, *excellens*, p. 128, fig. 7, Ecuador, Srnka, B. E. Z. xxix. ; *I. ilerdinoides*, p. 65, pl. xxviii., *athalina*, p. 66, pl. xxix., Up. Amazons, *troetschi*, Colombia, p. 67, pl. xxix., *fausta*, p. 67, pl. xxix., Up. Amazons, *fallax*, Chancamayo, p. 68, pl. xxix., *starkei*, Venezuela, *ibid.*, *ladra*, Ecuador, p. 69, pl. xxix., *paradoxa*, *anomala*, p. 69, pl. xxx., *mira*, *dimidiata*, *quinta*, Cauca Valley, Stgr., *t. c.*

Mechanitis doryssides, *huallaga*, Up. Amazons, *id. t. c.* p. 62, pl. xxviii. *Ceratinia porsenna*, p. 122, pl. i. fig. 5, *soror*, p. 124, Up. Amazons, Srnka, B. E. Z. xxix.; *C. antonina*, p. 59, *pantherina* (= *fluonia* ab.), *apollinis*, p. 60, Up. Amazons, Stgr., *t. c.*, and figured, pl. xxvii.

Napeogenes iquitensis, Up. Amazons, *id. t. c.* p. 63, pl. xxviii.

Tithorea cassandina, Ecuador, Srnka, B. E. Z. xxix. p. 129; *T. susanna*, Antioquia, p. 72, *furia*, Venezuela, p. 73, pl. xxx., Stgr., *t. c.*

Acræidæ.

Acræa johnstoni, p. 537, *brevia*, p. 538, Kilima-njaro, Godman, P. Z. S. 1885; *A. subhyalina*, pl. xxxii. p. 81, Up. Amazons, *lapitha*, Chiriqui, p. 82, *corona*, pl. xxxiii. p. 83, *pudorina*, pl. xxxiii., *leucosoma*, p. 84, Zanzibar, Stgr., Exot. Schmett.: spp. nn. *A. andromacha*, Fab., var. *indica*, Rōb., CB. Iris, No. 2, p. 22; *A. insignis*, variation of noticed, Godman, P. Z. S. 1885, p. 538.

Heliconiidæ.

Heliconius antiochus, L., var. *aranea*, Fab., figured, pl. xxxi., and *H. ocannus*, var. n. ?, described: Stgr., Exot. Schmett. p. 75. *H. faunus*, p. 74, pl. xxxi., *crispus*, *eleusinus*, pl. xxxi. p. 76, *hahneli*, pl. xxxi., *doris*, L., var. n. *viridis*, Stgr., pl. xxxii. p. 77, Colombia, *amor*, pl. xxxii., Lower Amazons, *vala*, Cayenne, *vedius*, Pebas, p. 78, *mars* (*erato*, L., var.), Pebas, pl. xxxii., p. 79, *hewitsoni*, Chiriqui, p. 80, spp. nn., *id. t. c.*

Eueides lybioides, pl. xxxii., *libitina*, Cayenne, p. 80, *id. t. c.*; *E. pellucida*, Cundinamarca, Srnka, B. E. Z. xxix. p. 130, pl. i. fig. 3: spp. nn.

Nymphalidæ.

For observations on variation, &c., of numerous species of *Nymphalidæ*, *vide* Schilde, Ent. Nachr. xi. pp. 22, &c.

Athyma inarina (? n. n. for *A. inara*, Moore, *nec* Doubl.), *Cyrestis thyo-Belenor*, Boisd., and *ganescha*, Koll., *Euripus halitherses*, *Junonia orithyia*, *Delias hel.* Butl., Ann. N. H. (5) xvi. pp. 303-309.

[illegible] *orahilia*, ♀ described; Weym., S. E. Z. xlvi. p. 262. *C. arsinoe* var. *moluccarum*, Stgr., Exot. Schmett. pl. xxxv. p 88.

Argynnis (*freja*?) larva; Sand., B. E. Z. xxix. p. 251. *A. freya*, Thbg., ab. *obscura*, Scandinavia; Ent. Tidskr. vi. p. 142. *A. frigga*, Thbg., ab. (var. ?) connecting it with *A. improba*, Butl.; *t. c.* pp. 142 & 214. *A. pales*, Fab., var. of, from Valais; Fallou, Bull. Soc. Ent. Fr. (6) v. p. ix. *A. pandora* var n. *paupercula*, Sicily, Rag., Nat. Sicil. iv. p. 271.

Melitæa elada, Hew., and *ulrica*, Edw., are one species; *M. bollii*, Edw., noticed: Aaron, Papilio, iv. pp. 175 & 176. *M. harrisii*, Scud., and *M. phaeton*, Drury, note on; Edw., Canad. Ent. xvii. p. 108. *M. rubicunda*, description of the last larval stages and chrysalis; Edw., Canad. Ent. xvii. p. 155. *M. maracandica*, Stgr., var. *saxatilis*, Chr., figured; Rom. Mem. ii. pl. xii. fig. 3. Albinism in italian female of *Melitæa didyma*; Peracca, Zool. Anz. viii. p. 24.

Phyciodes vesta, Edw., summer form (= *boucardi*, Godm. & Salv.); Aaron, Papilio, iv. p. 177. *P. phaon* occurs in Mexico; *id.* *P. tulcis*, Bates (= probably *punctata*, Edw.); *id.*

Synchloe glauconome noticed; Butl., P. Z. S. 1884, p. 492. *S. lacinia*, Gey., varieties mentioned; *S. adjutrix* and *mediatrix* taken in cop.: Aaron, Papilio, iv. p. 178.

Symbrenthia hippocla, Cr., and *daruka*, Moore, noticed; Nicév., J. A. S. B. liv. ii. p. 2.

Vanessa cardui; var. figured, JH. Ver. Württ. xli. pl. vi. fig. 3: abundant about Turin in 1883, Bull. Ent. Ital. 1885, p. 95. *V. milberti*, God., preparatory stages described at length; Edw., Canad. Ent. xvii. p. 181. *V. polychloros*, L., var. n. *erythromelas*, Algeria; Aust., Le Nat. p. 142. *V. urticæ*: melanic var., France; Le Nat. vii. p. 157. *V. antiopa*, aberration from Simplon; Fallou, Bull. Soc. Ent Fr. (6) v. p. ix. *V. prorsa, levana*, scales of; Tet, B. E. Z. xxix. p. 165, pl. vii. *V. c-album*, aberration of; Ent. Nachr. xi. p. 122.

Pyrameis atalanta pupating in a case made of leaves; Canad. Ent. xvii. p. 179.

Junonia asterie and *almana* one and the same; Swinh., P. Z. S. 1885, p. 128. *J. almana* and *asterie* are seasonal forms, according to Nicéville, P. E. Soc. 1885, p. ii., but *cf.* Butler, *t. c.* pp. v. & vi. *J. almana* and *asterie*, L., are wet and dry season forms of one species; J. A. S. B. liv. ii. p. 44. *J. here*, Lang., commented on; Butl., P. Z. S. 1884, p. 482. *J. orithya* var. *celebensis*, Stgr., figured; Exot. Schmett. p. 98, pl. xxxvii.

Precis amestris: note on, and figures of varieties; Dewitz, B. E. Z. xxix. p. 142, pl. ii. figs. 1–5.

Doleschallia: note on the species of; Dist., Ent. M. M. xxii. p. 41.

Diadema alimena var. n. *salvini*, Timor Laut; Kirsch, P. Z. S. 1885, p. 276, pl. xix. fig. 3.

Hypolimnas misippus: observations on mimetic capacities of; Butl., P. Z. S. 1884, p. 481. Variation of *H. bolina*; P. E. Soc. 1885. p. xxvi. *H. jacintha*, Drury, is var. or seasonal form of *bolina*, L.; Nicév., J. A. S. B. liv. ii. p. 44.

Hestina. Butl., Ann. N. H. (5) xvi. p. 309, proposes removal of this genus to *Satyrinæ*, between *Zethera* and *Orinoma*.

Limenitis sybilla aberr. *nigra*? described; Groult, Bull. Soc. Ent. Fr. (6) v. p. cxxxvi. *L. populi* with five wings; Röb., CB. Iris, p. 31: hermaphrodite of, figured; JH. Ver. Württ. xli. pl. vi. fig. 1.

Euthalia pyxidata, Weym., ♀ figured, pl. ii. fig. 1; S. E. Z. xlvi.

Apatura iris, L.: aberration figured; JH. Ver. Württ. xli. pl. vi. fig. 4: local var. *bieti*, Thibet, Oberth., Bull. Soc. Ent. Fr. (6) v. p. cxxxvi. *A. celtis*, Bois., = (*A. antonia* and *leilia*, Edw., and *A. cocles*, Lint.); Aaron, Papilio, iv. p. 178.

Anæa andria, Scud. Nomenclature discussed; *id. t. c.* p. 179.

Agrias amydon, Hew. ♀ described; Streck., P. Ac. Philad. 1885, p. 177.

Prothoe regalis described at length and figured; Butl., Ann. N. H. (5) xvi. p. 306, pl. viii. fig. 1.

New species :—

Calinaga sp. n., *cf. Papilionidæ*.

Cethosia carolinæ, Sumatra, Forbes, Naturalist's Wanderings, p. 274.

Messaras disjuncta, Nias I., Weym., S. E. Z. xlvi. p. 263.

Melitæa albiplaga, p. 175, *definita*, p. 176, Texas, Aaron, Papilio, iv.

Phyciodes annita, Venezuela, pl. xxxvi., *callonia*, Pebas, pl. xxxvi., with var. *murena*, p. 92, *alma*, S. Brazil, pl. xxxvi., *oblita*, *mimas*, Colombia, p. 93, *fallax*, Chanchamayo, *styx*, Antioquia, p. 94, Stgr., Exot. Schmett.

Gnathotriche sodalis, Colombia, *id. t. c.* p. 95.

Chlosyne adelina, Mexico, &c. (? *lacinia* var.), *id. ibid.*

Araschnia davidis, Moupin, Pouj., Bull. Soc. Ent. Fr. (6) v. p. xciv.

Symbrenthia silana, Sikkim, Nicév., J. A. S. B. liv. ii. p. 117, pl. ii. fig. 19.

Precis boisduvali, Madagascar, pl. xxxviii., *monroviana*, W. Africa, p. 100, *vetula*, Zanzibar, p. 101, *octavia* var. *natalensis*, pl. xxxviii., *ametris* var. *caffraria* [*sic*], pl. xxxviii. p. 101, spp. & varr. nn., Stgr., Exot. Schmett.

Trepsichrois van-deventeri, Sumatra to Assam, Forbes, Naturalist's Wanderings, p. 274.

Kallima spiridiva, Sumatra, Smith, *op. cit. ibid.*

Cynestis irmæ, Sumatra, Forbes, *op. cit. ibid.*

Amnosia eudamia, Sumatra, Smith, *op. cit.* p. 275.

Hypolimnas discandra, Nias I., Weym., S. E. Z. xlvi. p. 264, pl. i. fig. 6.

Neptis cura, Nias I., *id. t. c.* p. 265.

Athyma gracilis, Timor Laut, Kirsch, P. Z. S. 1885, p. 276, pl. xix. fig. 4.

Euthalia numerica, Nias I., Weym., S. E. Z. xlvi. p. 267, pl. i. figs. 1 ♀, & 2 ♂.

Agrias sahlkei, Cayenne, Honr., B. E. Z. xxix. p. 278, pl. viii. fig. 4.

Charaxes distanti, Perak, *id. t. c.* p. 277 ; *C. violetta*, Delagoa Bay, Smith, Ent. M. M. xxi. p. 247.

Prothoë uniformis, ? Malacca, *angelica*, Borneo, &c., *regalis*, Manipur, Butl., Ann. N. H. (5) xvi. p. 53.

Morphidæ.

Moore's recent classification of genera of *Morphinæ* and *Nymphalinæ* impugned ; Nicév., J. A. S. B. liv. ii. p. 43.

Tenaris buruensis, Buru, sp. n., Forbes, Naturalist's Wanderings, p. 411.

Satyridæ.

For observations on variation, &c., of numerous species of *Satyridæ*, *vide* Schilde, Ent. Nachr. xi. pp. 136 *et seq.*

Nicéville, L. de, P. A. S. B. 1884, p. 186, gives a list of the dry and wet season forms of butterflies near Calcutta in the case of six species of *Satyridæ*, viz. :—*Mycalesis mineus*, L. = (*mineus* + *indistans*, Moore) ; *M. perseus*, F., = (*perseus* + *blasius*, Fab.) ; *M. medus*, F., = *medus* +

runcka, Moore) ; *Melanitis leda*, L., = (*leda* + *ismene*, Cram.); *Yphthima philomela*, Joh., = (*philomela* + *marshalli*, Butl.) ; *Y. huebneri*, Kirb., = (*huebneri* + *howra*, Moore). Similar note by Nicév., J. A. S. B. liv. ii. p. 1 ; also *cf.* P. E. Soc. 1885, p. ii., and pp. v. & vi., where Butler queries the justice of these conjectures.

Callerebia orixa, Moore, var. from Assam, *Pachama mestra*, Hew., *Calysisme peribœa*, Fab., *Yphthima ordinata*, Butl, Assam, varr. noticed by Butl., Ann. N. H. (5) xvi. pp. 301 & 302.

Zophœssa andersoni (= *Debis albolineata*, Pouj., *infrà*) ; Bull. Soc. Ent. Fr. (6) v. p. cxliii.

Neonympha canthus, Bois. : chrysalis described ; Canad. Ent. xvii. p. 112.

Erebia medusa, S. V., var. *polaris*, Stgr., *lappona*, Esp., ab. *pollux*, Esp., p. 143 ; *ligea*, L., v. *adyte*, Hb. p. 144, notes on ; Ent. Tidskr., also *op. id.* pp. 214 & 215. Characters of the N. American *Erebiæ* ; Ent. Am. i. pp. 36–38. *E. dabanensis*, Ersch., figured, pl. xvi. fig. 1 ; Rom. Mém. ii. *E. lappona*, Esp. : metamorphoses, &c. ; Sand., B. E. Z. xxix. pp. 249–251.

Callerebia annada var. (= *C. hybrida*, Young) ; Ent. M. M. xxii. p. 130 [*cf.* Butl., *t. c.* p. 156].

Œneis bore, Schn. Life-history and distribution ; Sand., B. E. Z. xxix. pp. 247–249.

Arge galathea, aberration of, from Simplon ; Fallou, Bull. Soc. Ent. Fr. (6) v. p. x.

Satyrus arethusa : transformations described ; Chrétien, Bull. Soc. Ent. Fr. (6) v. p. cxxxiv. *S. fidia* var. n. *albovenosa*, Algeria ; Aust., Le Nat. vii. p. 142.

Abnormality in *Epinephele hyperanthus* ; Ent. M. M. xxi. p. 190. Hermaphrodite of *E. lycaon* figured ; JH. Ver. Lüneb. ix. p 131.

Hipparchia semele var. (= *diffusa*) ; Young, Ent. M. M. xxii. p. 130.

On the distinctness of *Aulocera scylla* from *A. brahminus* ; Butl., Ent. M. M. xxi. p. 245. On the genus *Aulocera*, with synonymy ; Elwes, *op. cit.* xxii. pp. 10–12. Reply to Butler ; Nicéville, *t. c.* p. 101 ; Butl., it. *t. c.* p. 127. Graham-Young remarks upon certain Himalayan species of Satyrid *Rhopalocera* ; *t. c.* p. 128.

Xois sesara, Hew. Life-history, with figs. of larva and pupa ; Math., Tr. E. Soc. 1885, p. 365, pl. x. figs. 5–8.

Triphysa albovenosa figured ; Rom. Mém. ii. pl. xxvi. fig. 2.

New species :—

Pierella (*Hetœra*) *amalia* (= *lena* var., Hew.), *lucia* (= *astyoche* var., Hew.), Weym., S. E. Z. xlvi. p. 284.

Debis moupiniensis, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) iv. p. cxl. ; *D. luteofasciata*, *albolineata* [*cf. Zophœssa andersoni*, *suprà*], and *violaceopicta*, Mou-pin, *id. t. c.* pp. cliv., clv., & clviii. ; *D. ocellata*, Mou-pin, *id. op. cit.* v. p. x.

Erebia patagonica, Patagonia, Mab., Bull. Soc. Philom. (7) ix. p. 55.

Chionobas antarcticus, Patagonia, *id. t. c.* p. 56 ; *C. macounii*, Lake Nipigon, Edw., Canad. Ent. xvii. p. 74.

Satyrus sieversi, Achal-Tekke, Chr., Rom. Mém. ii. p. 167, pl. xv.

figs. 1*a*, *b*; *S.* (*Pararge*) *hyglæa*, E. Russia, Mab., Bull. Soc. Philom. (7) ix. p. 55; *S.* (*P.*) *davidianus*, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) v. p. cxv.; *S. manzorum*, Mou-pin, *id. op. cit.* iv. p. cxxiv.

Neosatyrus hahnii, Patagonia, Mab., Bull. Soc. Philom. (7) ix. p. 55.

Xenica orichora, Australia, Meyr., Ent. M. M. xxii. p. 82.

Mycalesis ustulata, Perak, Dist., Ent. xviii. p. 289; *M. penicillata*, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) iv. p. cxxxv.; *M. oculatissima*, Mou-pin, *id. op. cit.* v. p. xxv.

Yphthima albescens, Mou-pin, *id. t. c.* p. xli.; *Y. alemola*, Poona, Swinh., P. Z. S. 1885, p. 127; *Y. excellens*, Madagascar, Butl., Ent. M. M. xxi. p. 198.

Elymniidæ.

Elymnias kunstleri, Perak, sp. n., Honr., B. E. Z. xxix. p. 276, and woodcuts.

Erycinidæ.

Godman & Salvin, Biol. Cent. Am. *Lep. Rhop.* i. pp. 361–496, pls. xxxviii.–xli., deal with a portion of the *Erycinidæ*. Many changes in the classification of the family are proposed, and under the generic headings, the neuration, structure of the legs, and of the male subexternal ("secondary") sexual organs are elaborated. The following known genera or species are commented on or figured:—*Eurygona*, *E. aurantiaca*, pls. xxxix. figs. 1 & 2, & xliii. figs. 9 & 10, *gyda* (= *russata*, G. & S.), pl. xxxix. figs. 3 & 4, *crotopus*, pl. xl. figs. 7 & 8, *athena*, pl. xxxix. figs. 21 & 22, *amphidecta*, pl. xl. figs. 5 & 6, *eubule*, figs. 13–15, *hypophæa*, figs. 9 & 10, *leucorrhoa*, figs. 11 & 12, *hieronymi*, pl. xxxix. figs. 13 & 14, *inconspicua*, figs. 19 & 20, *pusilla*, pl. xl. figs. 16 & 17, *regipennis*, figs. 1–4, *bettina*, figs. 23 & 24, *cataleuca*, figs. 21 & 22, *aurantia*, figs. 18–20, *chrysippe* (= *labiena*, Hew.), pl. xxxix. figs. 5–8. *Methonella*, *M. chrysomela*, pl. xli. figs. 1–4. *Hades*, *H. noctula*. *Eurybia*, *E. patrona*, pl. xxxviii. figs. 1 & 2, *lycisca*, p. 377. *Mesosemia*, *M. telegone*, figs. 3 & 4, *hesperina*, figs. 13 & 14, *carissima*, figs. 8 & 9, *gaudiolum*, fig. 5, pl. xliii. fig. 1, *grandis*, pl. xxxviii. figs. 6 & 7, *asa*, figs. 10 & 11, *cecropia*, fig. 12, *vestalis*, fig. 17. *Cremna*, *C. eucharilis*, figs. 18 & 19. *Zeonia*, *Z. bogota*, p. 389. *Diorhina*, *D. periander*, *præcas*, *butes*. *Erycina*, *E. jurgenseni* (= *E. montezuma*, ♂), *inca*, *cacica*. *Lyropteryx*, *L. cleadas*, pl. xli. figs. 9–12. *Necyria*, *N. beltiana*, *ingaretha*. *Monethe*. *Nothema*, *N. cumeus*. *Cyrenia*.

Eurygona procula, p. 365, pl. xxxix. figs. 15–18, Costa Rica, *sergia*, figs. 9–12, p. 367, Guatemala to Panama, *eupepla*, p. 369, pl. xliii. figs. 5–8, Panama, spp. nn., Godm. & Salv., *t. c.*

Eurybia unxia, p. 377, Nicaragua to Panama, *id. t. c.*, sp. n.

Mesosemia methion, Mexico, Guatemala, p. 380, *thetys*, Colombia, p. 381, *cælestis*, p. 382, pl. xxxviii. fig. 16, Costa Rica, *zonalis*, p. 384, fig. 15, & pl. xliii. fig. 2, Nicaragua to Colombia, *leucogæa*, p. 385, Nicaragua, *lepida*, fig. 3, Panama, *molina*, Nicaragua to S. America, *nivalis*, fig. 4, Mexico

to Nicaragua, *nivea*, Boliva, Brazil, p. 386, *chionea*, Guiana, p. 387, *id. t. c.*, spp. nn.

Necyria laranda, p. 397, pl. xliii. figs. 11 & 12, *id. t. c.*, sp. n.

Monethe rudolphus, Nicaragua, p. 398, *id. t. c.*, sp. n.

LYCÆNIDÆ.

Satadra, Moore, merged in *Panchala*; Dist., Rhop. Mal. p. 272.

Waterhouse, Aid, iii. pl. clxiii., figures *Theritas oakesii*, Butl., figs. 1 & 1*a*, *Aphnæus tigrinus*, Moore, figs. 2 & 2*a*, *orcas*, Drury, figs. 3 & 3*a*, *himalayana*, Moore, figs. 4 & 4*a*.

Nacaduba: in Sikkim tailed and tailless forms occur in company, and the character is not specific; *N. ardates*, Moore, noticed; Nicév., J. A. S. B. liv. ii. p. 3. *Neopithecops*: the species variable; *id. t. c.* p. 46. *Spindasis tigrina*, Moore, suspected as var. of *vulcanus*, F., p. 49. *Hypochrysops bubases*, Hew., redescribed and sexes figured as *Catapæcilma bubases*; *id. t. c.* p. 118.

Cyaniris puspa, Hors., *Nacaduba ardates* and *bhutea*, Moore, noticed; Butl., Ann. N. H. (5) xvi. p. 335. *C. ladon*, Cram., = (*C. pseudargiolus*, Boisd.); *id.*, Ent. Am. i. p. 53.

Pentila. On the true type (*P. undularis*); *id.* Ent. M. M. xxii. p. 59.

Polyommatus phlæas, L., var. *americanus*, ab. (Scandinavian); Ent. Tidskr. vi. pp. 141 & 214.

Chryophanus hippothoe, L.: discussion on application of the name; Butl., Ent. M. M. xxii. p. 64; Wallengr., *t. c.* p. 90; Butl., *t. c.* p. 110. *C. phlæas* (= *P. timeus*, Cram., = *C. stygianus*, Butl.); Swinh., Tr. E. Soc. p. 340.

Lycæna gaika probably distinct from *L. lysamon*; Godman, P. Z. S. 1885, p. 539. *L. theophrastus* var. n. *rosacea*, Algeria; Aust., Le Nat. vii. p. 141. *L. pseudargiolus*, Bois.: note on some seasonal forms of; Canad. Ent. xvii. p. 110. *L. isola*, Reak., = (*alce*, Edw.); Aaron, Papilio, iv. p. 180.

Zizera trochilus, Frey., = (*Lycæna parva*, Murray); Butl., P. Z. S. 1884, p. 484.

Thecla blenina, Hew., = (*siva*, Edw.); *T. adria*, Hew., = (probably *clytie*, Edw.): Aaron, Papilio, iv. pp. 179 & 180.

New genera and species:—

Purlisa, p. 249, for *Iolaus giganteus*, Dist.; Dist., Rhop. Mal.

Neocheritra, p. 252, for *Myrina amrita*, Feld.; *id. t. c.*

Nacaduba hampsonii, Nilgiri Hills, Nicév., J. A. S. B. liv. ii. p. 118, pl. ii. fig. 13.

Lucia? pyrodiscus (Newm.), S. Australia, Rosk., Ann. N. H. (5) xvi. p. 377.

Catochrysops bengalia, Calcutta, Nicév., *t. c.* p. 47; *C. theseus*, p. 131, pl. ix. fig. 8, *nicola*, p. 132, India, Swinh., P. Z. S. 1885.

Lycæna davidi, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) iv. p. cxxxv.; *L. opalina*, Mou-pin, *id. op. cit.* v. p. cxliii.; *L. marginata*, *thibetensis*, Mou-pin, *id. t. c.* p. cli.; *L. patago*, Patagonia, Mab., Bull. Soc. Philom.

p. 226, *beraka*, p. 227, Celebes, *dacudeli*, p. 226, *dschaka*, p. 227, Batavia, *kolantus*, *saruna*, p. 227, India, *id. t. c.*

Telesto drachmophora, Australia, Meyr., Ent. M. M. xxii. p. 82; *T. scepticalis*, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 379, pl. xi. fig. 2; ? *T. sangira*, Celebes, Plötz, B. E. Z. xxix. p. 230.

Plesioneura nigricans, Sikkim, Nicév., J. A. S. B. liv. ii. p. 123, pl. ii. fig. 6; *P. queda*, Malacca, *zawi*, Celebes, *wokana*, Aru Is., Plötz, B. E. Z. xxix. p. 225.

Plastingia kobros, Aru Is., *id. t. c.* p. 228; *P. noëmi*, Sikkim, Nicév., J. A. S. B. liv. ii. p. 120, pl. ii. fig. 15.

Halpe sitala, pl. ii. fig. 5, S. India, *kumara*, fig. 10, Sikkim, *id. t. c.* p. 121.

Isoteinon pandita, p. 121, pl. ii. fig. 14, *flavipennis*, p. 122, fig. 4, Sikkim, *id. t. c.*; *I. flexilis*, Poona, Swinh., P. Z. S. 1885, p. 147, pl. ix. figs. 9 & 10; *I. melania*, Malacca, Plötz, B. E. Z. xxix. p. 230.

Thanaos jhora, p. 122, pl. ii. fig. 12, *kali*, p. 123, fig. 3, Sikkim, Nicév., J. A. S. B. liv. ii.

Antigonus sezendis, Ceylon, Plötz, B. E. Z. xxix. p. 230.

Tagiades utanus, p. 230, *menanto*, *kirmana*, p. 231, Malacca, *neïra*, p. 230, *editus*, p. 231, Aru Is., *kowaia*, N. Guinea, *area*, Bengal, Celebes, p. 231, *id. t. c.*

Gomalia litoralis, Kurrachee, Swinh., P. Z. S. 1884, p. 513, pl. xlvii. fig. 4.

HETEROCERA.

[*Cf.* Butler (50), Camboué (56), Constant (80, 81), Druce (94, 124), Glaser (122), Mann (205), Millière (220), Moore (224), Pagenstecher (239), Pryer (257), Röber (287), Smith (319), Stretch (334), Wailly (348), Walsingham (351, 352).]

On the number of abdominal segments in Lepidopterous larvæ; Packd., Am. Nat. xix. p. 307. *Bombycidæ* is considered the "oldest" group of *Lepidoptera*.

On the "use of the pupæ of moths in distinguishing species;" *id. t. c.* p. 715.

Notes on some structural characters of *Lepidoptera* in reference to *Sphingidæ* and *Zygænidæ*; Smith, Ent. Am. i. p. 161, &c.

SPHINGIDÆ.

[*Cf.* Poulton (256) (larvæ), Smith (318).]

Macroglossa bombyliformis: note on var. of; Speyer, S. E. Z. xlvi. p. 83.

Cephonodes hylas. Larva described; Ann. N. H. (5) xv. p. 415.

Charocampa suffusa, Bois., noticed and figured; Tijdschr. Ent. xxviii. p. 254, pl. ix. fig. 2.

Deilephila euphorbiæ var. n. *grentzenbergi*, Ins. Capri; Stgr., Ent. Nachr. xi. p. 10.

Panacra vigil. Larva noticed; Swinh., P. Z. S. 1885, p. 287.

Protoparce orientalis. Larva noticed; Swinh., P. Z. S. 1885, p. 289.

Darapsa versicolor, Clem. Note on larva of; Canad. Ent. xii. p. 78.

Daphnis nerii at Poonah noticed; Swinh., P. Z. S. 1885, p. 288.

Sphinx catalpæ: larva destroyed by cuckoos; Riley, Rep. Ent. 1884, p. 415. *S. convolvuli* in London; P. E. Soc. 1885, p. xxv. *S. convolvuli*, *ligustri*, and *Acherontia atropos*, emergence from pupa; Pouj., Bull. Soc. Ent. Fr. (6) v. p. clxiv. *S. ligustri*: life-history of early stages; Poulton, Tr. E. Soc. 1885, pp. 281–290.

Acherontia styx, West.: note on larva; Swinh., P. Z. S. 1884, p. 513; 1885, p. 290. *A. atropos*: notes on its occurrence in France in 1885; Le Nat. vii. p. 181.

Smerinthus ocellatus. Life-history of early stages; Poulton, Tr. E. Soc. 1885, pp. 290–296.

New species :—

Ambulyx ochracea, Japan, Butl., Cist. Ent. iii. p. 113.

Charocampa stipularis, Afghanistan, Swinh., Tr. E. Soc. 1885, p. 346, pl. ix. fig. 1.

Deilephila komarovi, Achal-Tekke, Chr., Rom. Mém. ii. p. 169, pl. xv. figs. 2*a*, *b*.

Panacra insignis, Java, Snell., Tijdschr. Ent. xxviii. p. 252, pl. ix. fig. 1.

Sphinx constricta, Japan, Butl., Cist. Ent. iii. p. 113; *S. separatus*, N. Mexico, Neum., Ent. Am. i. p. 92; *S. panaquire*, Prov. Saltensis, Berg, An. Soc. Arg. xix. p. 266.

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Sesia asiliformis: larva described, and its habits; P. E. Soc. 1885, p. xxii. *S. cruentata*, Mann.: sexes figured; Nat. Sicil. iv. p. 272, pl. iv. figs. 1 & 2. *S. ichneumoniformis*, F. ?, noticed and figured; Rom. Mém. ii. p. 116, pl. iv. fig. 2.

Larva of *Harmonia pini*, and a parasite of it discussed; Ent. Am. i. p. 171, &c.

New genus and species :—

Scoliomima, near *Toosa*, for *S. insignis*, sp. n., p. 371, pl. x. fig. 10, Borneo; Butl., Tr. E. Soc. 1885.

Sesia aurifera, Transcaucasus, Chr., Rom. Mém. ii. p. 116, pl. iv. fig. 3.

Pyrrhotarnia elda, California, Edw., Ent. Am. i. p. 49.

COCYTIIDÆ and AGARISTIDÆ.

Cocytia veitchii, Butl., figured; Waterh., Aid, iii. pl. clv. fig. 1.

Ægocera tricolor, Druce, figured; *id. t. c.* pl. clv. fig. 2.

Eusemia hornimanni, Druce, figured; *id. ibid.* fig. 5. *E.* (by error *Emesia*) *grandis*, Druce; *id. ibid.* figs. 3 & 4. *E. opheltes*, Burmah, sp. n., Druce, P. Z. S. 1885, p. 518.

Chalcosiidæ, Ctenuchidæ, and Thymaridæ.

Elcysma (sub *Aglaope*) *westwoodii*, Voll., = (*Chalcosia caudata*, Brem., = *E. translucida*, Butl.); Snell., Tijdschr. Ent. xxviii. p. 201.

Gingla radialis, Walk., figured, pl. xii. fig. 26; Biol. Centr. Am. *Het.*

Himantopterus, Wesm., commented on by Butl., Ann. N. H. (5) xv. p. 340.

Note on *Doratopteryx*; *id. op. cit.* xvi. p. 51.

Callamesia, g. n., near *Amesia*, for *Epyrgis midama*, H.-Sch.; *id. op. cit.* xv. p. 345.

Pedoptila, g. n., near *Himantopterus*, for *P. nemopteridia*, W. Africa, sp. n.; *id. t. c.* p. 341, woodcut.

Devanica bicolor, Cachar, sp. n., Moore, J. A. S. B. liii. p. 235.

Amesia hyala, Darjeeling, sp. n., Druce, P. Z. S. 1885, p. 518.

Corma ernestina, Bombay, sp. n., Swinh., P. Z. S. 1885, p. 302, pl. xx. fig. 2.

Gingla josialis, Guatemala, pl. xii. fig. 27, *tortricalis*, fig. 28, Costa Rica, p. 120, spp. nn., Druce, Biol. Centr. Am. *Lep. Het.*

Erasmia laja, Ins. Nias, sp. n., Pagen., JB. nass. Ver. xxxviii. p. 11, pl. i. fig. 5.

Pidorus flavo-fasciatus, Ins. Nias, sp. n., *id. t. c.* p. 12, pl. i. fig. 4.

Melaneridæ and Dioptidæ.

Druce, Biol. Centr. Am. *Lep. Het.*, figures or notices, pp. 142–160:—*Oricia truncata*, pl. xiii. fig 23, *Virbia minuta*, *Scedros* (sub *Josia*), *dilatata*, Walk. (= *Milodora agis*, Boisd.); *Ephialtas enoides*, pl. xiv. fig. 1; *Flavinia* (sub *Chrysauge*) *intercepta*, Walk. (= *Xanthyris adunca*, Boisd.), pl. xiv. fig. 8, *Nelo chrysomela*, fig. 7, *Evagra jalifa*, fig. 15.

Phalcidona vespertina, Walk. (= *Xanthyris osera*, Boisd.); Druce, *t. c.* p. 145. *Œnotrus* (*cf. infra*) (*Ardonea*) *secretus*, Walk. (= *Melanchroia spuria*, Edwards); *id. t. c.* p. 154.

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Hiera, near *Oricia*, p. 149, for *H. gyge*, Panama, sp. n., *ibid.* pl. xiv. fig. 10; Druce, *t. c.*

Haynagora, near *Darna*, for *H. catagrammina*, sp. n., Nicaragua and Panama, pl. xvi. figs. 3 & 4; *id. t.* p. 148. *H. buckleyi*, pl. xxxii. fig. 17, *lex*, Ecuador, spp. nn., *id.* P. Z. S. 1885, p. 527.

Formiana, near *Flavinia*, for *F. mænades*, sp. n., Bolivia, pl. xxxii. fig. 18; *id. t. c.* p. 528.

Pseudomennis, near *Mennis*, type *Edule bipennis*, Walk., and *P. coccinea*, Brit. Honduras, pl. xiv. fig. 11, p. 152, sp. n.; *id.* Biol. Centr. Am.

Œnotrus, type *Josia dispar*, Walk., nd to include *Œ. striatus*, pl. xiv. figs. 12 & 13, p. 154, *pacilius*, p. 155, Guatemala, spp. nn.; *id. t. c.*

Astyochia, p. 157, for *A. crane*, pl. xiv. figs. 18 & 19, *faula*, fig. 28, Panama, *fessonia*, Costa Rica, Colombi, p. 158, spp. nn.; *id. t. c.*

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Sataspes ribbei, Celebes, Röb., CB. Iris, p. 29, pl. i. fig. 5.

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Œnotrus, type *Josia dispar*, Walk., nd to include *Œ. striatus*, pl. xiv. figs. 12 & 13, p. 154, *pacilius*, p. 155, Guatemala, spp. nn.; *id. t. c.*

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Tithraustes, p. 158, for *T. hæmon*, p. 58, pl. xiv. fig. 20, *deiphon*, fig. 25, Panama, *eteocles*, *butes*, Guatemala, p. 59, spp. nn.; *id. t. c.*

Polypœtes, p. 159, for *P. deldon*, pl. xiv. fig. 24, *eriphus*, Guatemala, *etearchus*, fig. 23, *demades*, Guatemala to Panama, *eserines*, Costa Rica, p. 160, spp. nn. ; Druce, Biol. Centr. Am.

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Sagaris horo, Panama, p. 144, pl. xiii. fig. 25, *id. t. c.*

Actæa minuta, Ecuador, *id.* P. Z. S. 1885, p. 526; *A.* (?) *draconis*, Panama, p. 145, pl. xiv. fig. 6, *id.* Biol. Centr. Am.

Ephialtias ilaire, Panama, pl. xiii. fig. 26, *ariaca*, fig. 27, Mexico, p. 147, *id. t. c.*

Darna splendens, Costa Rica, pl. xiv. fig. 2, p. 147, *id. t. c.* ; *D. unifasciata*, pl. xxxii. fig. 14, *imperialis*, fig. 15, p. 526, *tripunctata*, fig. 16, p. 527, Ecuador, *id.* P. Z. S. 1885.

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Bepara chiguinda, Ecuador, *id.* P. Z. S. 1885, p. 524, pl. xxxii. fig. 10.

Lyces fornax, Ecuador, sp. n., *id. t. c.* p. 525, pl. xxxii. fig. 11.

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Micropus elegans, Ecuador, *id.* P. Z. S. 18 p. 529, pl. xxxii. fig. 20.

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Sagala antiphates, Ecuador, *id. t. c.* p. , pl. xxxiii. figs. 14 & 15.

Erbessa calydon, *capena*, Ecuador, *id.* p. 534.

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Dioptis candelaria, pl. xiv. fig. 16, 57, Panama, *id. t. c.*

Zygæ.

[*Cf.* Smith (319).]

Zygæna ecki, Chr., figured ; Romm. ii. pl. xiii. fig. 1. . fig

Ino statices var. *crassicornis*, fig. *t. c.* pl. Mill., Ann. Soc. Ent. Fr. (6) v. p. 119, pl. ii. fig. 10. d ; *id. il.*

Chalciope disjuncta, Moore, figur & Waterh., Ad, iii. pl. clx. fig. 2.

Gnophæla, *cf. Pericopidæ*.

New genus and species :—

Dibos, for *D. iratus*, India, sp. n., Swinh., P. Z. S. 1885, p. 291, pl. xx. fig. 7.

Zygæna eudæmon, mauritanica, Algeria, Mab., Bull. Soc. Philom. (7) ix. p. 57.

Procris translucida, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) iv. p. cxxxvi.

Harrisina australis, Florida, *metallica*, N. Mexico, Stretch, Ent. Am. i. p. 102.

Syatomis blanchardi and *davidi*, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) civ. p. cxxxvi. ; *S. geon*, Mindanao, Druce, P. Z. S. 1885, p. 519, pl. xxxii. fig. 2 ; *S. ribbei*, p. 29, pl. i. fig. 6, *gracilis*, p. 30, fig. 7, Celebes, Röb., CB. Iris ; *S. albifrontalis*, pl. i. fig. 8, S. ?, *lasara*, pl. ii. fig. 8, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 13.

Lycomorpha notha, sinuata, Mexico, Edw., Ent. Am. i. p. 128.

Mydrodoxa semperi, Luzon, Druce, P. Z. S. 1885, p. 519, pl. xxxii. fig. 1.

Charidea mariamne, Colombia, *id. t. c.* p. 519, pl. xxxii. fig. 3.

Eressa musa, Bombay, Swinh., P. Z. S. 1885, p. 290, pl. xx. fig. 1.

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Pericopis angulosa, Walk., = (*irenides*, Butl., = *Chetone heliconoides*, Boisd.) ; *P. felderi* figured, pl. xii. fig. 4, *salvini*, fig. 3 ; *Gnophæla æquinoctialis* noticed : Druce, Biol. Centr. Am. *Lep. Het.* pp. 113–116.

New species :—

Eucyane childon, pl. xxxii. fig. 4, *phlegon*, fig. 5, *chesalon*, p. 520, *simsoni, chislon*, p. 521, Ecuador, Druce, P. Z. S. 1885.

Coreura salmoni, Colombia, *id. t. c.* p. 521, pl. xxxii. fig. 6.

Hyalurga caralis, Ecuador, *H.* (?) *pubites*, Up. Amazons, *id. t. c.* p. 522.

Phaloë pyste, Ecuador, *id. t. c.* p. 522.

Pericopis irene, Paraguay, *phyleis*, Ecuador, *id. t. c.* p. 523 ; *P. daphne*, pl. xii. fig. 1, Panama, *umbra*, fig. 2, Salvador, p. 113, *id.* Biol. Centr. Am. *Lep. Het.*

Isostola superba, p. 115, pl. xiii. fig. 5, Guatemala, *id. t. c.*

Gnophæla disjuncta, Mexico, Edw., Ent. Am. i. p. 128 ; *G. morrisoni*, Mexico, Druce, *t. c.* p. 116, pl. xii. fig. 7.

Euschema ares, p. 279, pl. ii. fig. 9, *electra*, p. 281, Nias I., Weym., S. E. Z. xlvi.

Phæoclena inaria, Ecuador, p. 535, pl. xxxiii. fig. 16, *cingulina*, E. Peru, *aurantica*, pl. xxxiii. fig. 17, Bolivia, p. 536, Druce, P. Z. S. 1885.

Arctiidæ.

A. crane, pl. [illegible] Colombi[illegible] *cana*, Grote), *Heraclia* (sub *Arctia*) *fervida*, Walk. (= *commixta*, Butl.,

Druce, Biol. Centr. [illegible] *let.* pp. 116–119, notices *Leucarctia acræa*, *Arctia docta*, Walk. (- [illegible], p.

Polypates, p. 159, for *P. deldon*, pl. xiv. fig. 24, *eriphus*, Guatemala, *etearchus*, fig. 23, *demades*, Guatemala to Panama, *esernius*, Costa Rica, p. 160, spp. nn. ; Druce, Biol. Centr. Am.

Virbia thersites, Panama, p. 144, pl. xiii. fig. 24, *id. t. c.*

Sagaris hora, Panama, p. 144, pl. xiii. fig. 25, *id. t. c.*

Aetaea minuta, Ecuador, *id.* P. Z. S. 1885, p. 526; *A.* (?) *draconis*, Panama, p. 145, pl. xiv. fig. 6, *id.* Biol. Centr. Am.

Ephialtias ilaire, Panama, pl. xiii. fig. 26, *ariaca*, fig. 27, Mexico, p. 147, *id. t. c.*

Darna splendens, Costa Rica, pl. xiv. fig. 2, p. 147, *id. t. c.* ; *D. unifasciata*, pl. xxxii. fig. 14, *imperialis*, fig. 15, p. 526, *tripunctata*, fig. 16, p. 527, Ecuador, *id.* P. Z. S. 1885.

Josia glycera, Colombia, p. 527, *oribia*, E. Peru, p. 528, *id. t. c.* ; *J. frigida*, Guatemala, *decorata*, pl. xiv. fig. 5, Mexico and Guatemala, p. 149, *id.* Biol. Centr. Am.

Bepara chiguinda, Ecuador, *id.* P. Z. S. 1885, p. 524, pl. xxxii. fig. 10.

Lyces fornax, Ecuador, sp. n., *id. t. c.* p. 525, pl. xxxii. fig. 11.

Seca fluonia, pl. xxxii. fig. 11, *orilochia*, *eleonica*, fig. 13, Ecuador, spp. nn., *id. t. c.* p. 525.

Josiomorpha striata, Ecuador, *id. t. c.* p. 52[illegible]; *J. gigantea*, Costa Rica, p. 150, *id.* Biol. Centr. Am.

Flavinia cyrene, Bolivia, *roxana*, pl. xxxi fig. 19, E. Peru, *ops*, New Granada, *id.* P. Z. S. 1885, p. 529 ; *F. vela*, Panama, pl. xiv. fig. 9, p. 151, *id.* Biol. Centr. Am.

Evagra ribbei, Panama, pl. xiv. fig. 14, p. 3, *id. t. c.*

Micropus elegans, Ecuador, *id.* P. Z. S. 18[illegible] p. 529, pl. xxxii. fig. 20.

Mennis fidentia, Colombia, pl. xxxiii. fig. [illegible]*herona*, fig. 2, *ficulnea*, fig. 3, *hagno*, p. 530, *halia*, fig. 4, *ficaria*, fig. 5, Ecuador, p. 531, *id. t. c.*

Devara bubona, pl. xxxiii. fig. 6, *phyleis*, [illegible]uador, *id. t. c.* p. 531.

Nelo uxisama, pl. xxxiii. fig. 7, *xenopithicomisa*, fig. 8, *tolosa*, p. 532, *splendens*, fig. 11, *fustina*, fig. 10, *fraterna* fig. 12, p. 533, *philodamea*, p. 534, fig. 13, Ecuador, *veliterna*, p. 533, [illegible]. 9, Ecuador and Colombia, *id. t. c.*

Sagala antiphates, Ecuador, *id. t. c.* p. 5[illegible] pl. xxxiii. figs. 14 & 15.

Erbessa calydon, *capena*, Ecuador, *id. t.* p. 534.

Pseudebessa cassandra, Ecuador, *caresa* E. Peru, *id. t. c.* p. 535.

Laurona chthonophyle, Mexico, pl[illegible]iv. fig. 17, p. 156, *id.* Biol. Centr. Am.

Dioptis candelaria, pl. xiv. fig. 16, 157, Panama, *id. t. c.*

Zygæidæ.

[*Cf.* Smith (319).]

Zygæna ecki, Chr., figured ; Rom[illegible]m. ii. pl. xiii. fig. 1. [illegible]fi[illegible]

Ino statices var. *crassicornis*, fig[illegible]*d. t. c.* pl. cl[illegible]Mill., Ann. Soc. Ent. Fr. [illegible]

(6) v. p. 119, pl. ii. fig. 10. [illegible]ed ; *id. ib.* [illegible]. and note ;

Chalciope disjuncta, Moore, figur[illegible]3 & [illegible]Waterh., Aid, iii. pl. clx. fig. 2.

Gnophæla, *cf. Pericopidæ*. [illegible]ed ; [illegible]

New genus and species :—

Ibbos, for *D. iratus*, India, sp. n., Swinh., P. Z. S. 1885, p. 291, pl. xx. fig. 7.

Zygæna eudæmon, mauritanica, Algeria, Mab., Bull. Soc. Philom. (7) ix. p. 57.

Procris translucida, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) iv. p. cxxxvi.

Harrisina australis, Florida, *metallica*, N. Mexico, Stretch, Ent. Am. i. p. 102.

Syatomis blanchardi and *davidi*, Mou-pin, Pouj., Bull. Soc. Ent. Fr. (6) civ. p. cxxxvi. ; *S. geon*, Mindanao, Druce, P. Z. S. 1885, p. 519, pl. xxxii. fig. 2 ; *S. ribbei*, p. 29, pl. i. fig. 6, *gracilis*, p. 30, fig. 7, Celebes, Röb., CB. Iris ; *S. albifrontalis*, pl. i. fig. 8, S. ?, *lasara*, pl. ii. fig. 8, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 13.

Lycomorpha notha, sinuata, Mexico, Edw., Ent. Am. i. p. 128.

Mydrodoxa semperi, Luzon, Druce, P. Z. S. 1885, p. 519, pl. xxxii. fig. 1.

Charidea mariamne, Colombia, *id. t. c.* p. 519, pl. xxxii. fig. 3.

Eressa musa, Bombay, Swinh., P. Z. S. 1885, p. 290, pl. xx. fig. 1.

Pericopidæ and Euschemidæ.

Pericopis angulosa, Walk., = (*irenides*, Butl., = *Chetone heliconoides*, Boisd.) ; *P. felderi* figured, pl. xii. fig. 4, *salvini*, fig. 3 ; *Gnophæla æquinoctialis* noticed : Druce, Biol. Centr. Am. *Lep. Het.* pp. 113–116.

New species :—

Eucyane childon, pl. xxxii. fig. 4, *phlegon*, fig. 5, *chesalon*, p. 520, *simsoni, chislon*, p. 521, Ecuador, Druce, P. Z. S. 1885.

Coreura salmoni, Colombia, *id. t. c.* p. 521, pl. xxxii. fig. 6.

Hyalurga caralis, Ecuador, *H.* (?) *pahites*, Up. Amazons, *id. t. c.* p. 522.

Phaloë pyste, Ecuador, *id. t. c.* p. 522.

Pericopis irene, Paraguay, *phyleis*, Ecuador, *id. t. c.* p. 523 ; *P. daphne*, pl. xii. fig. 1, Panama, *umbra*, fig. 2, Salvador, p. 113, *id.* Biol. Centr. Am. *Lep. Het.*

Isostola superba, p. 115, pl. xiii. fig. 5, Guatemala, *id. t. c.*

Gnophæla disjuncta, Mexico, Edw., Ent. Am. i. p. 128 ; *G. morrisoni*, Mexico, Druce, *t. c.* p. 116, pl. xii. fig. 7.

Euschema ares, p. 279, pl. ii. fig. 9, *electra*, p. 281, Nias I., Weym., S. E. Z. xlvi.

Phæoclena inaria, Ecuador, p. 535, pl. xxxiii. fig. 16, *cingulina*, E. Peru, *aurantica*, pl. xxxiii. fig. 17, Bolivia, p. 536, Druce, P. Z. S. 1885.

Arctiidæ.

Druce, Biol. Centr. Am. *Lep. Het.* pp. 116–119, notices *Leucarctia acræa*, *Arctia docta*, Walk. (= *mexicana*, Grote), *Heraclia* (sub *Arctia*) *fervida*, Walk. (= *commixta*, Butl.).

Gnophœla, *cf. Pericopidæ*.

Fodinoidea. The natural position of the genus is near the W. African *Colbusa*; Butl., Ent. M. M. xxi. p. 197.

Axiopœna maura, Eichw. Larva described and figured; Chr., Rom. Mém. ii. p. 171, pl. xv. fig. 3.

Arctia: note on some varieties of; Neum., Ent. Am. i. p. 93. *A. geneura*, Strecker: ♀ described; French, Papilio, iv. p. 158. *A. quenselii* v. *gelida*, Möschl., and *festiva*, Bkh.: metamorphoses; Sand., B. E. Z. xxix. pp. 252 & 253. *A. hebe*: aberration of; Kautz, S. E. Z. xlvi. p. 46.

Epatolmis luctifera = (*japonica*, Walk.); Butl., Cist. Ent. iii. p. 114.

Ph. *Arthus-bertrandi*, Guér. [*sic*], = (*Amerila piepersii*, Snell.); Snell., Tijdschr. Ent. xxviii. p. 40.

Callimorpha dominula, L., varr. *rossica*, *italica*, *persona*, noticed and figured; Stdfs., CB. Iris, pp. 23–29, pl. i. figs. 8, 9, & 10.

Laora, Walk. Berg characterizes this genus, and states that his ? *Bombyx deserticola* (afterwards referred to *Ocnogyna*) belongs to it; Verh. z.-b. Wien, xxxv. p. 359.

New species:—

Fodinoidea maculata, Madagascar, Butl., Ent. M. M. xxi. p. 198.

Nemeophila selwynii, Canada, Edw., Canad. Ent. xvii. p. 65.

Axiopœna fluviatilis, Afghanistan, Swinh., Tr. E. Soc. 1885, pl. ix. fig. 7.

Arctia approximata, p. 104, *obliterata*, *elongata*, p. 105, N. America, Stretch, Ent. Am. i.; *A. dehanna*, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 14, pl. i. fig. 10.

Seirarctia lewisii, Japan, Butl., Cist. Ent. iii. p. 115.

Estigmene mœrens, Japan, *id. t. c.* p. 114.

Euchætes murina, *bolteri*, N. America, Stretch, Ent. Am. i. p. 106.

Halesidota scapularis, N. Mexico, *id. ibid.*

Callimorpha recersa, N. America, *id. t. c.* p. 104.

Spilosoma mona, India, Swinh., P. Z. S. 1885, p. 295, pl. xx. figs. 3 & 4.

Alope clavatus, India, *id. ibid.*

Aloa flora, Bombay, *id. t. c.* p. 296, pl. xx. fig. 5.

Lithosiidæ.

Druce, Biol. Centr. Am. *Lep. Het.* pp. 120–142, notices, synonymises, or figures the following:—*Chrysocale magnifica*, pl. xii. fig. 10, *Tuina cingulata*, Walk. (sub *Itana*), fig. 11, *Odozana floccosa*, fig. 18, *Talara coccinea*, *Bryces disjuncta*, fig. 23 (= *Euchelia jenna*, Boisd.), *Ruscino latifasciatus*, fig. 24, *Ardonea morio*, *Deiopeia ornatrix*; *Manoleneura*, Butl., is probably identical with *Tricypha*, Mösch., p. 135; *Eudule conformis*, pl. xiii. fig. 9.

Hypocrita flavicollis, Snell., is not a *Chalcosia*; Snell., Tijdschr. Ent. xxviii. p. 39.

Pyralopsis divisa, Boisd. (= *Mapeta xanthomelas*, Walk.), and belongs to the *Pyralidæ*; Druce, Biol. Centr. Am. *Lep. Het.* p. 127, note.

Lithosia histrionica, H.-Sch., and *Setina alterna*, Walk., are synonymous; Rosk., Ann. N. H. (5) xvi. p. 381.

Deiopeia pulchella, swarm of, in the Atlantic; Ent. M. M. xxii. p. 12.

Euphanessa mendica. Its position discussed by Hulst, who decides it is Geometrid; Ent. Am. i. p. 67, &c.

New genera and species:—

Cementa, near *Tuina*, for *C. timora*, pl. vi. fig. 1, Costa Rica, *morio*, fig. 2, Guatemala, spp. nn.; Druce, Biol. Centr. *Lep. Het.* p. 123.

Pseudotalara, near *Talara*, for *P. chrysippa*, sp. n., pl. xii. fig. 22, p. 126; *id. t. c.*

Philenora, near *Mosoda*, for *Acontia undulosa*, Walk.; Rosk., Ann. N. H. (5) xvi. p. 382.

Apistosia tenebrosa, Mexico, *metella*, pl. xii. fig. 6, Guatemala, p. 121, *sylla*, fig. 8, Panama, *enna*, fig. 9, Mexico, p. 122, Druce, *t. c.*

Tuina sangala, p. 122, pl. xii. fig. 12, Guatemala, Panama, *id. t. c.*

Cisthene polyzona, p. 123, pl. xii. fig. 13, Mexico, *citrina*, fig. 14, Panama, *criton*, fig. 16, Guatemala, p. 124, *id. t. c.*; *C. plumbea*, Texas, p. 102, *lactea*, California, p. 103, Stretch, Ent. Am. i.

Crocota belfragei, *costata*, *obscura*, N. America, *id. ibid.*

Josiodes sibyllæ, Ecuador, Druce, P. Z. S. 1885, p. 523, pl. xxxii. fig. 7.

Odozana hercyna, p. 124, pl. xii. fig. 17, *elis*, fig. 19, *cordatula*, fig. 20, *hippona*, fig. 21, p. 125, Guatemala, *id.* Biol. Cent. Am. *Lep. Het.*

Talara pelopia, p. 125, pl. xii. fig. 21, Panama, *id. t. c.*

Mesenochroa rogersi, Costa Rica, p. 128, pl. xii. fig. 25, *id. t. c.*

Ptychoglene xylophila, p. 129, pl. xiii. fig. 1, Mexico to Nicaragua, *rubromarginata*, Costa Rica, p. 130, *id. t. c.*; *P. splendida*, Ecuador, *id.* P. Z. S. 1885, p. 524, pl. xxxii. fig. 8.

Lithosia mexicana, Mexico and Guatemala, pl. xiii. figs. 2 & 3, *laudamia*, Guatemala to Panama, fig. 4, *alba*, Panama, *lutea*, Guatemala, *intermedia*, Mexico, p. 131, *id.* Biol. Centr. Am.; *L. flammea*, Madagascar, Mab., Bull. Soc. Philom. (7) ix. p. 57.

Atolmis flavicollis, Mexico, p. 132, pl. xiii. fig. 6, Druce, *t. c.*

Crambomorpha sericea, Mexico, Guatemala, p. 132, *id. t. c.*

Areva leptilina, Costa Rica, pl. xiii. fig. 5, *marginata*, Guatemala and Costa Rica, p. 133, *id. t. c.*

Eurylomia ochreata, Brit. Honduras, p. 134, pl. xiii. fig. 7, *id. t. c.*

Eubaphe marginata, Guatemala, pl. xiii. fig. 8, *rogersi*, Costa Rica, p. 136, *id. t. c.*

Eudule tripunctata, Mexico, pl. xiii. fig. 10, *lineata*, fig. 11, Guatemala, p. 138, *id. t. c.*; *E. tritonia*, Ecuador, pl. xxxii. fig. 9, *sicelides*, Bolivia, *id.* P. Z. S. 1885, p. 524.

Leptidule medea, Guatemala, Costa Rica, p. 139, pl. xiii. fig. 12, *id.* Biol. Centr. Am.

Autoceras (?) *phelina*, Panama, p. 139 (figured, pl. xiii. fig. 13, as *Melania phelina*), *id. t. c.*

Scepsis wrightii, California, Stretch, Ent. Am. i. p. 101.

Nola patella, Mexico, pl. xiii. fig. 14, *philodina*, fig. 15, Costa Rica,

p. 139, *ophrydina*, Mexico, Guatemala, fig. 16, *minuta*, fig. 17, *melicerta*, fig. 18, *patina*, fig. 19, *intermedia*, Costa Rica, p. 140, *terulosa*, Costa Rica to Brazil, fig. 21, *vulgaris*, fig. 22, Costa Rica, p. 141, Druce, *t. c.*; *N. hyemalis*, California, Stretch, Ent. Am. i. p. 102; *N. microphasma*, Japan, Butl., Cist. Ent. iii. p. 117.

Emene plumatella, Guatemala, p. 141, pl. xiii. fig. 20, Druce, *t. c.*; *E. niasica*, Ins Nias, Pagen., JB. nass. Ver. xxxviii. p. 25, pl. i. fig. 7.

Ghoria collitoides, Japan, Butl., Cist. Ent. iii. p. 115.

Katha aprica, Japan, *id. ibid.*

Miltochrista bicittata, Japan, *id. t. c.* p. 116.

Mosoda consolatrix, jocularis, pl. xi. fig. 6, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 381.

Ræselia pascua, India, Swinh., P. Z. S. 1885, p. 293, pl. xx. fig. 6.

Brunia chota, Poona, *id. ibid.* pl. xx. fig. 11.

Hypsidæ.

Aganais albifera, Feld., = (*lacteata*, Butl.); *A. inconspicua*, Butl., = (*A. membliaria*, Cr. ?, Snell., olim); Snell., Tijdschr. Ent. xxviii. p. 39.

Hypsa perimele, sp. n., Nias I., Weym., S. E. Z. xlvi. p. 275, pl. ii. fig. 3.

Vitessa and *Damalis*, spp. nn., *cf. Pyralidæ*.

Nycteolidæ and Nyctemeridæ.

Earias anthophilana, Snell., = (*tristrigosa*, Butl.); Snell., Tijdschr. Ent. xxviii. p. 40.

Nomenclatorial errors as to *Nyctemera latistriga*, Walk., and *inconstans*, Vollenh., noticed; Snell., *t. c.* pp. 38 & 39.

Nyctemera cydippe, sp. n., Nias I., Weym., S. E. Z. xlvi. p. 274, pl. ii. fig. 8.

Position of *Pterothysanus* discussed: Butl., Ann. N. H. (5) xvi. p. 345. *P. atratus*, Assam, sp. n., *id. t. c.* p. 346, pl. viii. fig. 3.

Liparidæ.

Lerna nivosa, Walk. (*Noctuidæ*), should be transferred to *Liparidæ*; Rosk., Ann. N. H. (5) xvi. p. 383.

Waterhouse, Aid, iii. pl. clxiv., figures *Redoa cygna*, Moore, fig. 2, *Dasychira strigata*, Moore, fig. 4, and *Lymantria similis*, Moore, fig. 6.

Orgyia aurolimbata var. an sp. n., Transcaucasus, noticed; Rom. Mém. ii. p. 8.

Eggs of vapourer moth; Sci. Goss. xxi. p. 73, coloured plate.

Enome (*Lymantria*) *detersa*, Walk., figured, pl. xxi. figs. 3 & 4; *obsoleta* noticed, p. 300: Swinh., P. Z. S. 1885.

Artaxa leithiana, variation of; *id. t. c.* p. 298.

Leucoma impressa, Snell., = (*Caviria cygna*, Moore), *Euproctis flavata*, Cram., ♂ = (*incomta*, Snell.); Snell., Tijdschr. Ent. xxviii. p. 40.

Chærotriche marginata, Moore, figured; Waterh., Aid, iii. pl. clxiv. fig. 5.

Anaphe panda and other species of the genus noticed; Walsingham, Tr. L. S. (2) ii. p. 423, &c.

Perina basalis. Larva noticed; Swinh., P. Z. S. 1885, p. 298.

Olene fusiformis (*Nioda*), Walk., ♂ described, p. 297, figured, pl. xx. fig. 8; *id. t. c.*

Thalaina inscripta, Walk. (= *Plusargyria principiaria*, H.-Sch.), Rosk., Ann. N. H. (5) xvi. p. 383.

New species :—

Epicoma pontificalis, S. Australia, *id. t. c.* p. 383.

Ocneria raddei, Transcaucasus, Rom. Mém. ii. p. 10, pl. i. figs. 3 & 4.

Gynæphora xerampelina, Poona, Swinh., P. Z. S. 1885, p. 299, pl. xxi. figs. 8 & 9.

Aroa sagrara, pl. xx. fig. 13, *clara*, figs. 9 & 10, India, *id. ibid.*; *A. luisa*, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 26. pl. ii. fig. 3.

Lælia gigantea, Japan, Butl., Cist. Ent. iii. p. 117.

Artaxa conspersa, Japan, *id. ibid.*

Porthetria eurydice, Japan, *id. t. c.* p. 118.

Calliteara pseudabietis, Japan, *id. ibid.*

Dasychira platyptera, Magellan, Mab., Bull. Soc. Philom. (7) ix. p. 58; *D. pryeri*, Japan, Butl., Cist. Ent. iii. p. 119.

Nerice bipartita, Japan, *id. ibid.*

Anaphe infracta, p. 422, pl. xlv. fig. 8, *carteri*, fig. 9, p. 423, S. America, spp. nn., Walsingm., Tr. L. S. (2) ii.

Olene olearia, pl. xx. figs. 14 & 15, India, Swinh., P. Z. S. 1885, p. 297.

Psychidæ.

The following are specially noticed or figured by Heylaerts, in Rom. Mém. ii. pp. 176–194 :—*Psyche detrita*, Led.; *Pachytelia villosella* var. *casanella* (Boisd.), Bruand, and (var.?) *hirtella*, Ev.; *Amicta lutea*, Stgr., var. *armena*, Heyl., p. 178, pl. ix. fig. 2 (*cf. t. c.* p. 7, sub *Psyche lutea*), and var. *schahkuhensis*, Heyl., pl. ix. fig. 3; *Amicta uralensis*, Frr., pl. ix. fig. 4; *Epichnopteryx nocturnella*, Alphér., p. 192, pl. ix. fig. 6. The following are redescribed at length :—*Epichnopteryx hofmanni*, p. 181, pl. x. fig. 1, *flavescens*, p. 183, pl. x. fig. 11, and var. *kubichaënsis*, p. 184, pl. ix. fig. 7, *E. staudingeri*, p. 185, pl. x. fig. 4, *E. millierei*, p. 186, pl. x. fig. 8; *Bijugis alpherakii* (apparently a new name for *Fumea rouasti*, Heyl., and *nocturnella*, Stgr., but the synonymy, as given, is incomprehensible), p. 187, pl. ix. fig. 10, *B. proxima*, Led., p. 189, pl. ix. fig. 9; and *Fumea rouasti*, p. 190, pl. ix. fig. 11.

Psyche quadrangularis. Note on cases of, &c.; Lucas, Bull. Soc. Ent. Fr. (6) v. p. lxvi.; Rom. Mém. ii. p. 7.

Oiketicus cramerii, Westd., = (*variegatus*, Snell.), but the case depicted by Westd. is rather that of *lewinii*; Snell. Tijdschr. Ent. xxviii. p. 40. *O. geyeri*, Berg. (= *Oik. tabacillus*, Weyenb.); Bull. Soc. Ent. Fr. (6) iv. p. cxxxi.

Kophene (sub *Perina*) *bipars*, Walk. (= *K. weyersi*, Heyl.); Heyl., C.R. ent. Belg. 1885, cxxii.

Liothula omnivora, life-history of: Ent. xviii. p. 153.

Oiketicus dewitzi, sp. n., Australia, Heyl., C.R. ent. Belg. 1885, p. cxix.

Eumeta ernesti, p. cxx. (? same as *Psyche albifrons*, Wallen., p. clxix.), *leeuweni*, Australia, p. cxlviii., *id. t. c.*; *E.* (?) *hekmeyeri*, Java, *id. t. c.* p. lix.: spp. nn.

Kophene weyersi, Sumatra, *id. t. c.* p. lxix., sp. n.

Chalia javana, Java, *id. t. c.* p. lxxxv.; *C. grisea*, *lurida*, Australia, *id. t. c.* p. cxx.: spp. nn.

Clania tenuis, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 422, pl. xi. fig. 3, sp. n.

Notodontidæ.

Pulodontis, Ober., noticed; Butl., Cist. Ent. iii. p. 127.

Lophopteryx ladislai, Ober., Japan, described; *id. t. c.* p. 126.

Zaranga pannosa, Moore, figured; Waterh., Aid, iii. pl. clxiv. fig. 1.

Harpyia interrupta, Chr. (? = *H. petri*, Alphér.), figured; Rom. Mém. ii. pl. ii. figs. 2 *a* & *b*.

Fentonia (sub *Harpyia*) *ocypete*, Brem., = (*lævis*, Butl.); Butl., Cist. Ent. iii. pp. 129 & 128.

Notodonta dromedarius, Lin. Pupation and larva noticed; Saud., B. E. Z. xxix. p. 257.

Pygæra bucephala. Ravages in gardens; Orm., Rep. viii. p. 68.

Clostera curtuloides, Ersch., figured; Rom. Mém. ii. pl. xvi. fig. 3.

Diloba cæruleocephala. Egg and young larva noticed; Ent. M. M. xxi. p. 274.

Ichthyura ornata, preparatory stages of; Canad. Ent. xvii. p. 248. *I. pallæ*, French: early stages described; *id. t. c.* p. 41.

Janassa lignicolor var. n. *coloradensis*; Edw., Ent. Am. i. p. 17.

Apatelodes angelica, Grote, note on; Canad. Ent. xvii. p. 34.

New genus and new species:—

Microphalera, near *Phalera*, p. 119, for *M. grisea*, sp. n., Japan, p. 120; Butl., Cist. Ent. iii.

Notodonta grummi, Transcaucasus, Chr., Rom. Mém. ii. p. 21, pl. i. fig. 6; *N. notaria*, Colorado, Edw., Ent. Am. i. p. 17.

Drymonia circumscripta, Japan, Butl., Cist. Ent. iii. p. 125.

Rosama macrodonta, Japan, *id. t. c.* p. 127.

Phalera bobi, Bombay, Swinh., P. Z. S. 1885, p. 302, pl. xxi. fig. 6.

Ichthyura brucei, Colorado, Edw., Ent. Am. i. p. 17.

Nadata behrensii, California, *id. t. c.* p. 49.

Janassa laciniosa, Mexico, *id. t. c.* p. 129.

Discophlebia lucasii, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 421, pl. xi. fig. 4.

Corma ernestina, sp. n., *cf. Chalcosiidæ*.

Arsacia frontirufa, sp. n., *cf. Pyralidæ*.

Limacodidæ.

Miresa inornata, Walk. ♂ described ; Butl., Cist. Ent. iii. p. 120.

Parasa chloris, H.-Sch. Larva described ; Canad. Ent. xvii. p. 161.

Lagoa. Unusual number of legs in its caterpillar ; note by Packd., Am. Nat. xix. p. 714.

Microleon, g. n., near *Lithacodes*, for *M. longipalpis*, sp. n., Japan ; Butl., Cist. Ent. iii. p. 121.

Aphendala divaricata, Moore, J. A. S. B. liii. p. 235, sp. n. (but *cf.* Zool. Rec. xxi. *Ins.* p. 215).

Drepanulidæ.

Callicilix, g. n., between *Auzata* and *Macrocilix*, for *C. abraxata*, Japan, sp. n. ; Butl., Cist. Ent. iii. p. 124.

Argyris superans, Japan, sp. n., *id. t. c.* p. 122 ; *A. superba* belongs to *Auzata*, Walk., *id. t. c.* p. 124.

Saturniidæ and Endromidæ.

Notes on silk-producing Bombyces reared in 1884 by Alfred Wailly, J. Soc. Arts, xxxiii. pp. 304, 410, & 638, relate to *Telea polyphemus*, *Actias luna*, *Callosamia promethea*, *Platysamia cecropia*, and *ceanothi* and hybrids, *Ceratocampa imperialis*, *Attacus cynthia*, *atlas*, *Antheræa pernyi*, and hybrid *roylei-pernyi*.

Hybridism of *Platysamia ceanothia-cecropia*, and of *Antheræa pernyi-roylei*, and of *A. mylitta-pernyi* ; Wailly, Bull. Soc. Acclim. (4) ii. pp. 412, 414, & 419.

Silkworms in Assam ; J. Soc. Arts, xxxiii. p. 526. These notes are taken from a Report on Silk in Assam, and relate to 3 domesticated and 9 wild species.

Attacus pernyi, breeding and acclimatizing of ; Bull. Soc. Acclim. (4) ii. p. 542. *A. cynthia* becoming polyphagous ; Pouj., Bull. Soc. Ent. Fr. (6) v. p. clxiv. *A. atlas*, L., from Timor Laut, described ; Kirsch, P. Z. S. 1885, p. 177.

Brahmæa lunulata var. *christophi* figured ; Rom. Mem. ii. pl. i. fig. 5.

Samia cecropia with an aborted fifth wing ; P. Ac. Philad. 1885, p. 26.

Antheræa paphia, Dumaine (95).

Note on *Platysamia polyommata* ; Ent. Am. i. p. 155.

Hemileuca maia, Drury. Larva described ; Canad. Ent. xvii. p. 243.

Saturnia cephalariæ, Transcaucasus, Rom. Mem. ii. p. 14, pl. xiv., imago and larva, sp. n.

Endromis versicolor. Note on its mode of exit from cocoon ; Pouj., Bull. Soc. Ent. Fr. (6) v. p. lxvi.

Bombycidæ.

Tracheæ of silkworm figured ; Coles, Studies in Microscopical Science, Sec. 4, No. 8, Sept. 1885.

Composition (chemical) of the ova of *Bombyx*; see Nature, xxxi. p. 620, and J. R. Micr. Soc. (2) v. p. 441.

Trilocha varians and *Thiacides postica* noticed, p. 302; the latter figured with larva, pl. xxi. figs. 1, 1*a*, & 2: Swinh., P. Z. S. 1885.

Ocinara comma, Hutton, figured; Waterh., Aid. ii. pl. clxiv. fig. 3.

Prismosticta hyalinata, Japan, sp. n., Butl., Cist. Ent. iii. p. 125.

Andraca gracilis, Japan, sp. n., *id. ibid.*

Lasiocampidæ.

Nataxa flavifascia, Walk., to be transferred from *Drepanulidæ* to *Lasiocampidæ*; Rosk., Ann. N. H. (5) xvi. p. 385.

Bombyx loti var. n. *algeriensis*; Baker, Ent. M. M. xxi. p. 242. *B. acanthophylli*, Chr., and larva figured; Rom. Mém. ii. pl. xiii. figs. 2 *a-d*. *B. castrensis*: variety of larva noticed; Rom. Mém. ii. p. 12. Nest of *B. psidii* described; Lucas, Bull. Soc. Ent. Fr. (6) v. p. lxxiii.

Adelocephala bicolor var. n. *suprema*, Iowa; Neum., Ent. Am. i. p. 94.

Borocera madagascariensis (and *Saturnia suraka*, Boisd.). Early stages and females, note on; Camboué, Bull. Soc. Acclim. (4) ii. p. 368.

Eupterote undata, Bl, larva noticed, p. 303; *E. discrepans*, Moore, *Messata castanoptera*, p. 304, *Nisaga simplex*, Walk., ♀ of each described; *Taragama ganesa*, Lef., *Trisula variegata*, larvæ and pupa, pl. xxi. fig. 7, noticed: Swinh., P. Z. S. 1885.

Trichiura crataegi, L., v. *ariæ*, Hb. Two forms of larvæ described; Saud., B. E. Z. xxix. pp. 254 & 255.

Eriogaster sp. (arctic). Larva and pupa described; *id. t. c.* p. 256.

New genus and species:—

Rondotia, near *Bombyx*, for *R. menciana*, sp. n., found feeding on wild mulberry in China; Moore, Ann. N. H. (5) xv. pp. 491 & 492.

Megasoma alpherakyi, N. Persia, Chr., Rom. Mém. ii. p. 202, pl. xiii. fig. 3, *a*, *b* (larva).

Bombyx staudingeri, Algeria, Baker, Ent. M. M. xxi. p. 242; *B. hyadesi*, Patagonia, Mab., Bull. Soc. Philom. (7) ix. p. 58.

Eupterote lucia, Assam, Butl., Ann. N. H. (5) xvi. p. 346, pl. viii. fig. 4; *E. gyra*, *diabolica*, India, Swinh., P. Z. S. 1885, p. 303.

Chrostogastria brevivenis, Japan, Butl., Cist. Ent. iii. p. 119.

Dirphia zeta, Buenos Aires, p. 267, *ruscheweyhi*, Tucuman, p. 268, Berg, An. Soc. Arg. xix.

Trabala irrorata, Mergui, Moore, J. A. S. B. liii. p. 205.

Colussa vinosa, sp. n., *cf. Geometridæ*.

Zeuzeridæ.

Preparatory stages of an undetermined *Cossus*, note on; Ent. Am. i. p. 173, etc.

Arbela tetraonis. Sexes and Moore's fig. noticed; Swinh., P. Z. S. 1885, p. 307.

Zeuzera sp. ?, wings and prothorax of, found in an ant's nest; Rom. Mém. ii. p. 2. *Endagria salicicola*, Ev., noticed; *t. c.* p. 4.

Romanoffia, g. n. [but *cf.* Zool. Rec. xxi. *Ins.* p. 220], for *R. imperialis*, sp. n., Chiriqui, Heyl., Rom. Mém. ii. p. 172, pl. ix. figs. 1*a–e*. [*Cf.* C.R. ent. Belg. 1 Mars, 1884.]

Endagria alpherakyi, p. 3, pl. ii. fig. 1, *saxicola*, p. 5, pl. i. fig. 1, Transcaucasus, Chr., Rom. Mém. ii., spp. nn.

Phragmatœcia fœda, sp. n., Kurrachee, Swinh., P. Z. S. 1884, p. 515, pl. xlvii. fig. 1.

Hepialidæ.

Charagia virescens: Hudson's note on life-history of this, translated into German by Hoffmann; S. E. Z. xlvi. pp. 313–317. Life-history of; Ent. xviii. p. 30.

Hepialus fuscus, Magellan, sp. n., Mab., Bull. Soc. Philom. (7) ix. p. 56.

Phassus triangularis, Mexico, sp. n., Edw., Ent. Am. i. p. 129.

Cymatophoridæ.

Cymatophora duplaris, Lin. Larva in Arctic regions noticed; Sand., B. E. Z. xxix. p. 257.

Uraba lugens, Walk., should be placed in *Cymatophoridæ*; Rosk., Ann. N. H. (5) xvi. p. 423.

Thyatira hedemanni, Transcaucasus, Chr., Rom. Mém. ii. p. 24, pl. ii. fig. 3; *T. flavida*, Japan, Butl., Cist. Ent. iii. p. 131: spp. nn.

Asphalia punctigera, Japan, sp. n., *id. t. c.* p. 131.

Noctuidæ.

The following previously known species are specially referred to or figured in Rom. Mém. ii. pp. 26-84:—*Agrotis polygonides*, Stgr., pl. ii. fig. 5, and var. *obscura*, fig. 6; *A. candelisequa*, Hb., variation, p. 32; *A. raddei*, Chr., pl. ii. fig. 9; *A. renigera*, Hb., variation, p. 35; *Mamestra accurata*, pl. ii. fig. 11; *Dianthœcia cœsia*, Bkh., var., p. 42; *Caradrina vicina*, Stgr., pl. iii. fig. 3; *Heliothis imperialis*, Stgr., imago and larva, pl. iv. figs. 4*a–c*; *Thalpochares jocularis*, Chr., pl. iii. fig. 8; *debilis*, Chr., pl. iii. fig. 9; *Erastia diaphora*, Stgr., pl. iii. fig. 11, *delicatula*, Chr., pl. iii. fig. 10; *Leucanitis saissani*, Stgr., pl. iii. fig. 13; *Pseudophia fixseni*, Chr., pl. iv. fig. 6; *Madopa inquinata*, Ld., pl. iv. fig. 7; *Bomolocha opulenta*, Chr., pl. iv. fig. 8.

Acronycta auricoma, S. V. Arctic larva noticed; Sand, B. E. Z. xxix. p. 258.

Leucania unipunctata, Haw.: life-history noticed, p. 350; metamorphoses figured, pl. v.: Riley, Fourth Rep. U. S. Ent. Comm. *L. yu*, Guen., = (*costalis*, Moore, = *nareda*, Feld.); Snell., Tijdschr. Ent. xxviii. p. 40.

Sinna calospila, Walk. (= *Teinopyga hæmacta*, Snell.; *cf. infrà*), and *S. extrema*, Walk. (= *T. reticularis*, Feld.); *S. fentoni* noticed: Butl., Cist. Ent. iii. p. 128.

Polytela gloriosa: larva noticed; Swinh., P. Z. S. 1885, p. 450.

Composition (chemical) of the ova of *Bombyx*; see Nature, xxxi. p. 620, and J. R. Micr. Soc. (2) v. p. 441.

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Bombyx loti var. n. *algeriensis*; Baker, Ent. M. M. xxi. p. 242. *B. acanthophylli*, Chr., and larva figured; Rom. Mém. ii. pl. xiii. figs. 2 *a–d*. *B. castrensis*: variety of larva noticed; Rom. Mém. ii. p. 12. Nest of *B. psidii* described; Lucas, Bull. Soc. Ent. Fr. (6) v. p. lxxiii.

Adelocephala bicolor var. n. *suprema*, Iowa; Neum., Ent. Am. i. p. 94.

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Trichiura crataegi, L., v. *ariæ*, Hb. Two forms of larvæ described; Saud., B. E. Z. xxix. pp. 254 & 255.

Eriogaster sp. (arctic). Larva and pupa described; *id. t. c.* p. 256.

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Hepialus fuscus, Magellan, sp. n., Mab., Bull. Soc. Philom. (7) ix. p. 56.

Phassus triangularis, Mexico, sp. n., Edw., Ent. Am. i. p. 129.

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Polytela gloriosa: larva noticed; Swinh., P. Z. S. 1885, p. 450.

Gortyna nitela, Guen. Note on habits; Riley, Rep. Ent. 1884, p. 392.

Charæas graminis, ravages of; Orm., Rep. viii. p. 15. *Agrotis segetum* and *Tryphæna pronuba*; *id.* p. 85. *C. graminis*, L.: notes on its biology and Hymenopterous parasites; Ent. Tidskr. vi. pp. 169–175 & 218.

Laphygma frugiperda, Abb., figured, with two vars., pl. lxii. figs. 2 *a–c*; Riley, Fourth Rep. U. S. Ent. Comm. *L. exigua*, notes on early stages of; Licht. & Chrét., Bull. Soc. Ent. Fr. (6) v. p. clvi., &c.

Contribution to life-history of *Trigonophora flammea*; Ent. xviii. p. 162.

Amyna (sub *Erastria*) *stigmatula*, Snell., note on; Butl., P. Z. S. 1884, p. 495.

Xylophasia opposita, Walk., var. from Aden noticed; *id. ibid.*

Agrotis, *cf.* Smith (320). Riley, Rep. Ent, notices the metamorphoses &c., of *A. messoria*, depredations, p. 290; figured, pl. ii. fig. 6; *anicra*, metamorphoses, fig. 1; depredations, p. 291; description, p. 292; *malefida*, depredations and description, p. 293; figured, fig. 3; *clandestina* figured, fig. 4; depredations, p. 293; *ypsilon* figured, fig. 2; depredations, p. 294; *saucia* figured, pl. iii. figs. 1 & 2; depredations, p. 297. *A. declarata*, Walk.: larva described; Canad. Ent. xvii. p. 32. *A. speciosa*, Hb., v. *arctica*, Zett.: larva noticed; Sand., B. E. Z. xxix. p. 260. *A. hyperborea*, Zett.: habits of larva in Arctic regions; *id. ibid.* Christoph, Rom. Mém. ii. pl. xii., figures *A. degeniata*, Chr., fig. 5, *stabulorum*, Bien., fig. 5, *mustelina*, fig. 6. *A. ledereri*, *difficilis*, Ersch., and ? *Erastria penthima*, Ersch., figured; *id. t. c.* pl. xvi. figs. 4–6. *A.* (*Triphæna*) *pronuba*: egg described; Ent. M. M. xxi. p. 274.

Orbifrons singularis, Stgr., figured; Rom. Mém. ii. pl. vi. fig. 1.

Brytis encaustus and var. *panceratii*, with their larvæ, figured; Nat. Sicil. iv. p. 272, pl. iv. figs. 3–6.

Mamestra subjuncta: metamorphoses figured, pl. ii. fig. 5; its depredations, p. 296; Riley, Rep. Ent.

Pachnobia carnea, Thnbg. Metamorphosis and distribution; Sand., B. E. Z. xxix. p. 258.

Hadena satura: larva described; Jord., Ent. M. M. xxii. p. 63. *H. dydima* var *strucei* figured; Nat. Sicil. iv. p. 274, pl. iv. fig. 7 (*cf.* p. 299, *t. c.*). *H. devastatrix*: metamorphoses and depredations; Riley, Rep. Ent. 1884, pl. iii. figs. 3 & 4, p. 296. *Dryobota* (*H.*) *protea*: egg and larva noticed; Ent. M. M. xxi. p. 274.

Dichonia aprilina. Egg and larva noticed; Ent. M. M. xxi. p. 273.

Cucullia (sp. n. ?) larva in flower-heads of *Typha latifolia*; Tet., B. E. Z. xxix. p. 159. *C. cineracea*, note on, p. 119, figured, pl. ii. fig. 11; Mill., Ann. Soc. Ent. Fr. (6) v.

Aspila virescens, Fab., note on, p. 351, figured, pl. lxii. fig. 4; Riley, Fourth Rep. U. S. Ent. Comm.

Chariclea umbra, Hfng. Note on the identity of *Pyrrhia exprimens*, Walk., with this; Mösch., Verh. z.-b. Wien, xxxiv. p. 317.

Anthœcia divitiosa, Walk., *cf. Tineida*, *postea*.

Metamorphoses, ravages, &c., of *Heliothis armigera*, Hüb., described, chap. xvi., Riley, Fourth Rep. U. S. Ent. Comm.; the former figured, pls. iii. & iv.

Anarta melaleuca, Thbg., and *A.* (*lapponica* ?). Larvæ described; Sand., B. E. Z. xxix. pp. 261 & 262.

Ariola bryophilina, Feld., and *corticea*, Snell., may provisionally be placed in *Lophoptera*, Guen.; Snell., Tijdschr. Ent xxviii. p. 41.

Thalpochares pudica, Snell., = (*Mestleta acontioides*, Moore); *id. ibid.*

Note on the generic position of *Noctua moldavicola*, H. S., which he opines should be in *Thalpochares*; *id. t. c.* p. 111.

Penicillaria jocosatrix. Larva noticed; Swinh., P. Z. S. 1885, p. 457.

Hyblæa pura. Larva noticed; *id. t. c.* p. 458.

Plusia chrysitis: dichotomic form; Speyer, S. E. Z. xlvi. p. 85. *P. moneta*: distribution; *id. t. c.* p. 87.

Aletia xylina, Say. The larger part of Riley's Fourth Rep. U. S. Ent. Comm. is devoted to this species: its natural history, parasites, enemies, ravages, and their prevention are discussed at great length. Chapter v., by C. S. Minot and E. Burgess, pp. 45–58, pls. vi.–xi., are devoted to the anatomy of the larva and perfect insect. On pl. i. the insect and its metamorphoses are figured (under the name of *A. argillacea*). *A. xylina* and *argillacea* discussed by Riley, Ent. Am. i. p. 161, &c.

Anomis erosa and *A. exacta*, Hub. (but *cf. A. texana*, *infrà*), metamorphoses figured; Riley, 4th Rep. pl. ii.; described, pp. 345–350.

Phoberia atomaris, Hüb., figured; *id. t. c.* pl. lxii. fig. 3.

Cosmophila xanthindyma, Bois., synonymy of; Butl., P. Z. S. 1884, p. 497.

Toxocampa cucullata, Moore, figured; Waterh., Aid, iii. pl. clx. fig. 1.

Stilbia anomala. Larva, &c., described; Ent. xviii. p. 1.

Callyna semivittata, Moore, figured; Waterh., Aid, iii. pl. clx. fig. 3.

Anophia leucomelas, Clerck, ♀ = (*olivescens*, Guén.); Snell., Tijdschr. Ent. xxviii. p. 41. *A. olivescens*: variation noticed; P. Z. S. 1885, p. 462.

Catocala. Note on ♂ character; Biol. Centralbl. iv. p. 724. Note on the European species of; P. C. T. Snellen, Tijdschr. Ent. xxviii. pp. 108–110. Möschler gives a summary of Hulst's paper on the N. American species, and the table of specific characters; S. E. Z. xlvi. pp. 115–124. *C. cerogama* varr. nn. *aurella* and *eliza*; Canad. Ent. xvii. p. 133.

Ophideres cacica, Guén. Larva described; Ent. Nachr. xi. p. 6.

Potamophora schlegelii described and figured; Snell., Tijdschr. Ent. xxviii. p. 4, pl. i. fig. 2.

Sypna complicata, Butl., fig. 1, *constellata*, Moore, fig. 2, *brunnea*, Moore, fig. 3, *cyanivitta*, Moore, fig. 4, *kirbyi*, Butl., fig. 5, *prunosa*, Moore, fig. 6, pl. clx., and *renisigna*, Moore, pl. clx. fig. 4, figured; Waterh., Aid, iii.

Daddala quadrisignata, Walk., figured; *id. t. c.* pl. clx. fig. 5.

Achæa melicerte. Larva noticed; Swinh., P. Z. S. 1885, p. 465.

Drasteria erechtea, Cram. Metamorphoses, p. 352, pl. lxii. fig. 5; Riley, Fourth Rep. U. S. Ent. Comm.

Magulaba, Walk., to be placed in *Thermesiidæ*, not in *Platydiidæ*; Butl., P. Z. S. 1884, p. 499.

New genera and species:—

Discordia (*Leucaniidæ*), for *D. evulsa*, sp. n., pl. xxvii. fig. 2; Swinh., P. Z. S. 1885, p. 448.

Anodapha, n. n. for *Polydesma*, Boisd. (*nec Polydesmus*, Latr.); Moore, Lep. Ceyl. iii. p. 91.

Panilla, type, *Homoptera dispila*, Walk.; *id. t. c.* p. 93.

Caduca (*Homopteridæ*), type, *Alamis meleagris*, Feld.; *id. t. c.* p. 96.

Minucia, n. n. for *Ascalapha*, Hub. (*nec Ascalaphus*, Fab.); *id. t. c.* p. 159. *M. prunicolor*, sp. n., p. 160, pl. clxvii. fig. 3.

Macaldenia, n. n. for *Pasipeda*, Moore (*nec* Walk.); *id. t. c.* p. 162.

Delgama, type, *Naxia calorifica*, Walk.; *id. t. c.* p. 168.

Caranilla, type, *Naxia onelia*, Guén.; *id. t. c.* p. 169.

Pindara, type, *Noctua illibata*, Fab.; *id. ibid.*

Arasada (*Poaphilidæ*), p. 188, for *A. pyraliformis*, sp. n., p. 189, pl. clxxii. figs. 1 & 1*a*; *id. t. c.*

Cauninda (for *Remigia*, group 2, Guén.), type, *Phalæna* (*Noctua*) *archesia*, Cram.; *id. t. c.* p. 190.

Matella, type, *Egnasia accingalis*, Walk.; *id. t. c.* p. 196.

Seneratia, type, *Thermesia præcipua*, Walk.; *id. t. c.* p. 202.

Dunira, type, *Thermesia scitula*, Walk.; *id. t. c.* p. 207.

Bryophila seladona, Transcaucasus, Chr., Rom. Mém. ii. p. 28, pl. ii. fig. 4.

Clidia excelsa, North Persia, *id. t. c.* p. 205, pl. xiii. fig. 4.

Leucania polemusa, Poona, Swinh., P. Z. S. 1885, p. 447, pl. xxvii. fig. 1.

Axylia furtiva, Poona, *id. t. c.* p. 448.

Teinopyga hæmacta (*cf. Sinna, suprà*), Java, Snellen, Tijdschr. Ent. xxviii. p. 1, pl. i. fig. 1.

Xylophasia incognita, Japan, Butl., Cist. Ent. iii. p. 132.

Nephelodes dotanidia, Japan, *id. ibid.*

Apamea repetita, Japan, *id. t. c.* p. 133; *A. lebruni*, Patagonia, Mab., Bull. Soc. Philom. (7) ix. p. 63; *A. pullata*, Argentine Rep., Berg, An. Soc. Arg. xix. p. 270; *A. viriata*, Poona, Swinh., P. Z. S. 1885, p. 450.

Miana falsa, Japan, Butl., Cist. Ent. iii. p. 132.

Luperina mutica, Transcaucasus, Chr., Rom. Mém. ii. p. 47, pl. iii. fig. 2.

Episema lederi, p. 44, pl. iii. figs. 1*a* & *b*, *pænulata*, p. 45, pl. ii. fig. 12, Transcaucasus, *id. t. c.*

Agrotis hahni, p. 33, pl. ii. fig. 8, *korsakovi*, p. 35, pl. ii fig. 10, *romanovi*, p. 37, pl. ii. fig. 7, Transcaucasus, *id. t. c.*; *A. ingouffii*, *bicolor*, Patagonia, *gracila*, p. 59, *carbonifera*, p. 60, Magellan, *digramma*, *diantheciæ*, Patagonia, p. 60, *aphe*, Algeria, *xanthostola*, *frigida*, Magellan, p. 61, *aethes*, no locality, p. 62, Mab., Bull. Soc. Philom. (7) ix. [illegible] pl. ix. fig. 4, *conformis*, fig. 5, Afghanistan, [illegible] Swinh. Tr. E. Soc. 1885; *A. vana*, India, Swinh., P. Z. S. 1885, p. [illegible] Cist. Ent. iii. [illegible] vii. fig. 9.

Triphænopsis cinerescens, Japan, Butl., [illegible] Rom. [illegible] p. 133.

Caradrina paupera, Transcaucasus, [illegible] Chr., Tr. E. Som. ii. p. 56, pl. iii. fig. 4; *C. belucha*, Afghanistan, Swinh., 1885, p. 348, pl. ix.

fig. 2 ; *C. sabulosa*, Kurrachee, *id.* P. Z. S. 1884, p. 516, pl. xlvii. fig. 6; *C. brevirosa*, Poona, *id.* P. Z. S. 1885, p. 454.

Peregea supplex, India, *id. t. c.* p. 452.

Rhizogramma unilinea, Poona, *id. ibid.* pl. xxvii. fig. 7.

Ozarba ituarra, pl. xxvii. fig. 14, *mallarba*, fig. 3, Poona, *id. ibid.*

Spælotis coruscantis, Afghanistan, *id.* Tr. E. Soc. 1885, p. 348, pl. ix. fig. 3.

Cirrædia borjomensis, Transcaucasus, Rom., Rom. Mém. ii. p. 61, pl. iii. fig. 6.

Orthosia purilinea, Patagonia, *mollis*, Magellan, p. 62, Mab., Bull. Soc. Philom. (7) ix.; *O. uniformis*, Afghanistan, Swinh., Tr. E. Soc. 1885, p. 350, pl. ix. fig. 6 ; *O. infrequens*, Kurrachee, *id.* P. Z. S. 1884, p. 517, pl. xlvii. fig. 11.

Tæniocampa sieversi, Tiflis, Rom., Rom. Mém. ii. p. 58, pl. iii. fig. 5.

Axylia bucephalina, Patagonia, Mab., Bull. Soc. Philom. (7) ix. p. 63.

Hadena tetragona, Magellan, *id. ibid.*

Dianthœcia magellana, Patagonia, *id. t. c.* p. 64.

Calophasia simplex, Patagonia, *id. ibid.*

Cucullia teichii and larva, Argentine Rep., Berg, An. Soc. Arg. xix. p. 271 ; *C. improba*, Transcaucasus, Chr., Rom. Mém. ii. p. 65, pl. iii. fig. 7.

Mamestra variegata, Algeria, Aust., Le Nat. vii. p. 142.

Anarta trisema, Magellan, Mab., *t. c.* p. 64.

Heliothis juncea, Bombay, Swinh., P. Z. S. 1885, p. 448, pl. xxvii. fig. 4.

Adisura uncta, Bombay, *id. t. c.* p. 449, pl. xxvii. fig. 12.

Marimatha pura, Poona, *id. t. c.* p. 455, pl. xxviii. fig. 16.

Acontia quintana, pl. xxvii. fig. 13, *firina*, fig. 5, *excisa* (Walk., MS.), p. 455, *pulla*, fig. 15, *opella*, fig. 16, p. 456, India, *id. t. c.*; *A. hortensis*, Kurrachee, *id. op. cit.* 1884, p 517, pl. xlvii. fig. 7.

Protheodes veprecola, Poona, *id. op. cit.* 1885, p. 456.

Erastria futilis, Kurrachee, *id. op. cit.* 1884, p. 517, pl. xlvii. fig. 8.

Thalpochares uberosa, Poona, *id. op. cit.* 1885, p. 457.

Anthophila zamia, pl. xlvii. fig. 12, *bulla*, fig. 9, p. 518, Kurrachee, *id. op. cit.* 1884.

Micra chalybea, p. 518, pl. xlvii. fig. 10, *furia*, fig. 13, *balux*, fig. 14, p. 519, Kurrachee, *id. t. c.*

Callopistria yerburii, Aden, Butl., P. Z. S. 1884, p. 496.

Plusia corrusca, alterna, Colorado, Streck., P. Ac. Philad. 1885, p. 178.

Orasia vagabunda, Kurrachee, Swinh., P. Z. S. 1884, p. 519.

Anomis texana, S. United States, Riley, Fourth Rep. U. S. Ent. Comm. p. 350, and App. note 58, p. 120 ; also figs. 4–6, pl. ii., under the erroneous name of *A. exacta*, Hüb.

Gonitis propinqua, Aden, Butl., P. Z. S. 1884, p. 497.

Axiopœna sp. n., *cf. Arctiidæ*.

Toxocampa [illegible], Poona, Swinh., P. Z. S. 1885, p. 459, pl. xxvii. fig. 10.

Pandesma devia, Kurrachee, *id. op. cit.* 1884, p. 520, pl. xlviii. fig. 3.

Girpa fraterna, Moore, Lep. Ceyl. iii. p. 94, pl. clvi. figs. 5 & 5*a*.

Othora ænea, Kurrachee, Swinh., P. Z. S. 1884, p. 520, pl. xlviii. fig. 1.

Selepa vitea, p. 460, pl. xxvii. fig. 17, *occulta*, p. 461, fig. 11, India, Swinh., P. Z. S. 1885; *S. strigifera*, Moore, Lep. Ceyl. iii. p. 103, pl. clviii. figs. 3 & 3*a*, larva.

Symitha sceptica, Bombay, Swinh., *t. c.* p. 461, pl. xxvii. fig. 6.

Callyna costiplaga, Moore, Lep. Ceyl. iii. p. 100, pl. clvi. fig. 10.

Cletthara basalis, *id. t. c.* p. 105, pl. clviii. fig. 7.

Plotheia lativitta, p. 106, pl. clvii. fig. 11, *griseovirens*, p. 108, pl clvii. fig. 9, *id. t. c.*

Arcte taprobana, *id. t. c.* p. 113, pl. clx. fig. 1.

Anophia dipteroides, *id. t. c.* p. 118, pl. clix. fig. 6; *A. arnoldi*, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 28, pl. ii. fig. 9.

Stictoptera richardi, Ins. Nias, *id. t. c.* p. 29, pl. ii. fig. 7.

Lophoptera kheilii, Ins. Nias, *id. t. c.* p. 30, pl. i. fig. 3; *L. costata*, Moore, Lep. Ceyl. iii. p. 123, pl. clix. fig. 8.

Gyrtona phycisoides, *id. t. c.* p. 125, pl. clviii. fig. 8.

Catocala andromache, California, Elw., Ent. Am. i. p. 50; *C. sancta*, p. 134, *duplicata*, p. 135, Japan, Butl., Cist. Ent. iii.; *C. afghana*, Afghanistan, Swinh., Tr. E. Soc. 1885, p. 352, pl. ix. fig. 8; *C. gitana*, Spain, Mab., Bull. Soc. Philom. (7) ix. p. 64; *C. rama*, Moore, Lep. Ceyl. iii. p. 128, pl. clx. fig. 6.

Potamaphora [*sic*] *hagenii*, Sumatra, Snell., Tijdschr. Ent. xxviii. p. 6, pl. i. fig. 3.

Sypna astrigera, Japan, Butl., Cist. Ent. iii. p. 135.

Hypopyra (subg. n. *Pæciloptera*, altered, p. 180, to *Hexamitoptera*). *lacinda*, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 35, pl. ii. fig. 5.

Dysgonia discalis, Moore, Lep. Ceyl. iii. p. 177, pl. clxxi. fig. 8.

Pasipeda satellitia, *id. t. c.* p. 184, pl. clxxi. figs. 6 & 6*a*.

Erchcia zura, *zygia*, India, Swinh., P. Z. S. 1885, p. 465.

Ophiusa olympia, India, *id. t. c.* p. 466.

Lagoptera bivirgata, Philippines, Snell., Tijdschr. Ent. xxviii. p. 11, pl. i. figs. 5 & 5*a*.

Grammodes mirabilis, Transcaucasus, Rom., Rom. Mém. ii. p. 78, pl. iv. fig. 5.

Acantholipes trifasciata, Moore, Lep. Ceyl. iii. p. 187, pl. clxxii. fig. 2.

Remigia arefacta, Kurrachee, Swinh., P. Z. S. 1884, p. 521, pl. xlviii. fig. 2; *R. quæsita*, Bombay, *id. op. cit.* 1885, p. 468, pl. xxvii. fig. 8.

Matella caduca, Poona, *id. t. c.* p. 470, pl. xxviii. fig. 9.

Daxata tantilla, Bombay, *id. t. c.* p. 470.

Zethes propinquus, Transcaucasus, Chr., Rom. Mém. ii. p. 75, pl. iii. fig. 12; *Z. albiguttata*, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 40, pl. ii. fig. 4; *Z. renalis*, Moore, Lep. Ceyl. iii. p. 194, pl. clxxii. fig. 12.

Egnasia binorbiculata, p. 194, pl. clxxii. fig. 6, *scopigera*, pl. clxxii. fig. 9, *ocellata*, pl. clxxiv. fig. 4, p. 195, *id. t. c.*

Hingula figurata, *id. t. c.* p. 199, pl. clxxiv. fig. 10.

Durdara zonula, Bombay, Swinh., P. Z. S. 1885, pl. xxvii. fig. 12.

Gesomia gemmâ, Poona, *id. t. c.* p. 469.

Mestleta lunifera, pl. clxxv. fig. 3, *interrupta*, pl. clxxv. fig. 7, p. 209, Moore, *t. c.*

Capnodes minor, *id. t. c.* p. 212, pl. cxxiv. fig. 11.

DELTOIDIDÆ.

Magulaba. Systematic position ; *cf. Noctuidæ*, p. 198.

Phalæna punctigera, L. (= *hilaria*, Cram.); a new genus is required for it and *Epizeuxis? tenuipalpis*, Snell.; Snell., Tijdschr. Ent. xxviii. p. 202.

Hypena obsitalis, Hüb., recorded as new to Britain, described and figured ; O. P. Camb., P. Dors. N. H. vi. p. 70, pl. iii. *H. obacerralis*, Walk. (? = *Xanthoptera semilutea*, Snell.) ; Butl., P. Z. S. 1884, p. 499.

Platyhypena scabra, Fab., noticed, p. 354, figured, pl. lxii. fig. 1 ; Riley, Fourth Rep. U. S. Ent. Comm.

Margaritia cordalis, Doub., = (*Sceliodes mucidalis*, Guen., = *Eretria obsistalis*, Snell.), but a new generic name will be required; Snell., Tijdschr. Ent. xxviii. p. 42.

Hipoepa raptatalis. Female described ; Swinh., P. Z. S. 1885, p. 474.

New genera and species :—

Marapana, type, *Hypena raralis*, Walk. ; Moore, Lep. Ceyl. iii. p. 227.

Lithilaria, near *Gisira*, for *L. ossicolor*, S. Australia, sp. n. ; Rosk., Ann. N. H. (5) xvi. p. 425.

Nabartha, type, *Bocana schaldusalis*, Walk.; Moore, Lep. Ceyl. iii. p. 234, and including *N. marginata*, sp. n., *ibid.*

Pantura, type, *Bocana ophiusalis*, Walk. ; *id. t. c.* p. 217.

Hadennia, type, *Bocana hypenalis*, Walk. ; *id. t. c.* p. 236, and including *H. prunosa*, sp. n., p. 237, pl. clxxvii. fig 8.

Corcobara thwaitesi, Moore, *t. c.* p. 218, pl. clxxvi. figs. 2, 2*a*, & 2*b*.

Dichromia pullata, *id. t. c.* p. 221, pl. clxxvi. fig. 4.

Rhynchina pervulgaris, India, Swinh., P. Z. S. 1885, p. 471, pl. xxviii. fig. 5.

Hypena mimicalis, pl. xxviii. fig. 6, *obstupidalis*, fig. 7, p. 471, *speculalis*, fig. 8, *recordialis*, fig. 9, p. 472, India, *id. t. c.*; *H. colombana*, pl. clxxvi. fig. 8, *biangulata*, pl. clxxvi. fig. 9, p. 223, *cognata*, pl. clxxv. fig. 8, p. 224, Moore, Lep. Ceyl. iii.

Rivula auropurpurea, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 42 ; *R. flavonigra*, Kurrachee, Swinh., P. Z. S. 1884, p. 522, pl. xlvii. fig. 15.

Ethia albicosta, Moore, Lep. Ceyl. iii. p. 232.

Marimatha lactea, Kurrachee, Swinh., P. Z. S. 1884, p. 522, pl. xlviii. fig. 7.

Myana sopora, p. 522, pl. xlviii. fig. 4, *atromacula*, p. 523, fig. 5, Kurrachee, *id. t. c.*

Pasira asigmatica, pl. xxviii. fig. 11, *russa*, fig. 13, p. 472, *inscitia*, p. 473, India, *id. t. c.* ; *P. renalis*, Moore, Lep. Ceyl. iii. p. 250.

Herminia orthosiana, pl. xxviii. fig. 15, *vellifera*, fig. 17, India, Swinh., P. Z. S. 1885, p. 473.

Hydrillodes insignis, Aden, Butl., P. Z. S. 1884, p. 500.

Nodaria cingala, Moore, Lep. Ceyl. iii. p. 233.

Bleptina ? sordescens, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 424, pl. xi. fig. 11.

Helia lunifera, p. 238, *figurata*, p. 239, Moore, Lep. Ceyl. iii.

Apphadana rusticula, pl. xxviii. fig. 1, p. 474, *rubicundula*, fig. 2, *festina*, fig. 3, *nigrofusca*, fig. 4, p. 475, India, Swinh., P. Z. S. 1885.

Spadix vegetus, India, p. 475, pl. xxviii. fig. 14, *id. t. c.*

Corgatha renalis, Moore, Lep. Ceyl. iii. p. 242, pl. clxxvii. fig. 3.

Bocana subapicalis, *id. t. c.* p. 244.

Byturna cucullata, *id. t. c.* p. 254.

Pinacia pupillalis, Sumatra, Snell., Tijdschr. Ent. xxviii. p. 7, pl. i. figs. 4 & 4 *a*.

Geometridæ.

[*Cf.* Meyrick (216).]

Euphanessa mendica, *cf. Lithosiidæ*, p. 189.

Bohatsch, Otto. Lepidopterologische Mittheilungen. Wien. ent. Z. iv. pp. 143–146 & 176–179.

Consists of miscellaneous observations on *Geometridæ* of the genera *Acidalia*, *Pellonia*, *Abraxas*, *Macaria*, *Boarmia*, *Cidaria*, *Eupithecia*, of the Palæarctic region.

Romanoff, Mém. ii. pp. 85–115, notices or figures the following *Geometridæ* : *Phorodesma smaragdaria* var. *prasinaria*, Ev., pl. v. fig. 1 ; *Pellonia auctata*, Stgr., pl. v. fig. 4, *P.* (*Aspilates*) *sieversi*, Chr., pl. v. fig. 5 ; *Macraria æstimaria*, Hb., p. 99.

Christoph, *t. c.* pp. 119–142, notices or figures *Acidalia moniliata*, F., *straminata*, Tr., *obsoletaria*, Rbr., *pecharia*, Stgr., *beckeraria*, Ld. ; *Boarmia cocandaria*, Ersch., pl. vi., figs. 2*a* & *b* ; *Eusarca pellonaria*, Stgr., pl. vi. figs. 6*a* & *b*, *vastaria*, Chr., pl. vi. fig 7, *cuprinaria*, Chr., pl. vi. figs. 8*a* & *b* ; *Lithostege* (*Anaitis*) *excelsata*, Ersch., pl. vi. fig. 12, *L. usgentaria*, Stgr., pl. vi. fig. 11 ; *Cidaria fluctuata*, L. ; *Eupithecia gueneata* var. *separata*, Stgr., p. 133, pl. vii. figs. 2 & 3.

Stegania ? allongata, Feld., should probably be placed in *Macariidæ* ; *Cidaria lucidulata*, Walk., transferred to *Chrysolarentia*, Butl. ; *Larentia laticostata*, Walk. (= *Scotosia canata*, Walk.), and therefore becomes a *Phryssogonus* ; Rosk., Ann. N. H. (5) xvi. pp. 430 & 431.

The following names previously recorded as species inhabiting New Zealand are to be erased from the New Zealand list, because they are Australian and probably not Neozealandian : *Panagra hypenaria*, Gn., *P. promelanaria*, Walk., *Camptogramma correlata*, Walk., *Coremia casta*, Butl. ; while other names are not to be recognized at all, viz. : *Ischalis thermochromata*, *Larentia infusata*, *Coremia robustaria*, and *Cidaria rudisata*, Walk. Meyr., Tr. N. Z. Inst. xvii. pp. 66 & 67.

Ipana leptomera, Walk. (= *Amphitape crassitibia*, Feld., = *Declana crassitibia*, ♀, Meyr.) ; *id. ibid.*

Declana (sub *Politeia*) *junctilinea*, Walk. (= *Chlenias verrucosa*, Feld., this not being *D. floccosa*, as previously recorded ; also = *D. crassitibia*, ♂, Meyr.) ; *id. t. c.* p. 65.

Angerona prunaria, on breeding varieties of; Ent. xviii. p. 253.

Selenia illunaria: ontogeny of larva, etc.; Poulton, Tr. E. Soc. 1885, pp. 309–318. *S. bilunaria*, Esp.: pupation in Arctic region noticed; Sand., B. E. Z. xxix. p. 262.

Crocallis tusciaria var. n. *gaigeri* and its larva, Dalmatia; Stgr., S. E. Z. xlvi. p. 349.

Lyrcea alectoraria, Walk. (= *Ennomos ustaria*, Walk., but not *Aspilates primata* and *Endropia mixtaria*, Walk., which names, having no locality, are to be dropped); Meyr., Tr. N. Z. Inst. xvii. p. 65.

Pygmæna fusca, Thnbg.: metamorphoses; Sand., B. E. Z. xxix. p. 264.

Nemoria viridata, food-plant of, discussed; Speyer, S. E. Z. xlvi. p. 91.

Acidalia robiginata, figs. 2 & 3, *asellaria*, figs. 4 & 5, pl. ii.: notes on these and their larvæ; Mill., Ann. Soc. Ent. Fr. (6) v. p. 115. *A. virgularia* var. n. *afra*, Algeria; Baker, Ent. M. M. xxi. p. 243. *A. rubraria*, Dbld. (= *repletaria* and *attributa*, Walk.); Meyr., Tr. N. Z. Inst. xvii. p. 63.

Hippolyte rubropunctaria, Dbld. (= *Acidalia pulchraria*, Walk. & Butl., *nec Asthena pulchraria*, Dbld.); *id. ibid.*

Thamnonoma acquiaria, note on, with fig. of ♂; Mill., Ann. Soc. Ent. Fr. (6) v. p. 116, pl. ii. fig. 8.

Amastris (sub *Macaria*) *humeraria*, Walk. (= *Lozogramma obtusaria*, Walk., = *Cidaria flexata* and *obtruncata*, *id.*, = *Sestra fusiplagiata*, *id.*, = *A. encausta*, Meyr.); Meyr., Tr. N. Z. Inst. xvii. p. 66.

Phasiane clathrata, L.: aberration; Kautz, S. E. Z. xlvi. p. 47.

Larentia lucidata, Walk. (= *L. psamathodes*, Meyr., = *Coremia plurimata*, Walk., = *Panagra venipunctata*, *id.*); *L.* (sub *Scotosia*) *subobscurata*, Walk. (= *L. petropola*, Meyr.); *L. cinereata*, Dbld. (= *L. diffusaria*, Walk.): Meyr., Tr. N. Z. Inst. xvii. p. 64. *L. subductata*, *L. quadristrigata*, Walk., *L. falcata*, Butl., *Phibalapteryx suppressaria*, Walk., and *Samana acutata*, Butl., noticed; *id. t. c.* pp. 66 & 67.

Liodes tibiaria larva, note on, with figs.; Mill., Ann. Soc. Ent. Fr. (6) v. p. 117.

Samana, Walk. The Australian species of *Panagra*, Gn., are to stand under this genus of Walker's; Meyr., Tr. N. Z. Inst. xvii. p. 65.

Statira (sub *Fidonia*) *enysii*, Butl. (= *S. homomorpha*, Butl., which was previously erroneously identified with *Pasithea brephos*, Walk.); *id. ibid.*

Eumacaria brunneata, Pack. Larva described; Canad. Ent. xvii. p. 33.

Arsinoe subochraria, Dbld. (= *Aspilates euboliaria*, Walk.); Meyr., Tr. N. Z. Inst. xvii. p. 64.

Eusemidæ (*cf.* p. 187, *ante*).

Lygris testudinaria var. n. *obscura*, Algeria, Baker, Ent M. M. xxi. p. 244.

Cheimatobia brumata. Ravages and remedies; Orm., Rep. viii. p. 1.

Eurydice (sub *Larentia*?) *rufescens*, Butl. (= *E. cymosema*, Meyr.); Meyr., Tr. N. Z. Inst xvii. p. 63.

Eupithecia hyperboreata, Stgr.: pupa noticed; Sand., B. E. Z. xxix.

Bleptina ? sordescens, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 424, pl. xi. fig. 11.

Helia lunifera, p. 238, *figurata*, p. 239, Moore, Lep. Ceyl iii.

Apphadana rusticula, pl. xxviii. fig. 1, p. 474, *rubicundula*, fig. 2, *festina*, fig. 3, *nigrofusca*, fig. 4, p. 475, India, Swinh., P. Z. S. 1885.

Spadix vegetus, India, p. 475, pl. xxviii. fig. 14, *id. t. c.*

Corgatha renalis, Moore, Lep. Ceyl. iii. p. 242, pl. clxxvii. fig. 3.

Bocana subapicalis, *id. t. c.* p. 244.

Byturna cucullata, *id. t. c.* p. 254.

Pinacia pupillalis, Sumatra, Snell., Tijdschr. Ent. xxviii. p. 7, pl. i. figs. 4 & 4 *a*.

Geometridæ.

[*Cf.* Meyrick (216).]

Euphanessa mendica, *cf. Lithosiidæ*, p. 189.

Bohatsch, Otto. Lepidopterologische Mittheilungen. Wien. ent. Z. iv. pp. 143–146 & 176–179.

Consists of miscellaneous observations on *Geometridæ* of the genera *Acidalia*, *Pellonia*, *Abraxas*, *Macaria*, *Boarmia*, *Cidaria*, *Eupithecia*, of the Palæarctic region.

Romanoff, Mém. ii. pp. 85–115, notices or figures the following *Geometridæ* : *Phorodesma smaragdaria* var. *prasinaria*, Ev., pl. v. fig. 1 ; *Pellonia auctata*, Stgr., pl. v. fig. 4, *P.* (*Aspilates*) *sieversi*, Chr., pl. v. fig. 5 ; *Macraria æstimaria*, Hb., p. 99.

Christoph, *t. c.* pp. 119–142, notices or figures *Acidalia moniliata*, F., *straminata*, Tr., *obsoletaria*, Rbr., *pecharia*, Stgr., *beckeraria*, Ld. ; *Boarmia cocandaria*, Ersch., pl. vi., figs. 2*a* & *b* ; *Eusarca pellonaria*, Stgr., pl. vi. figs. 6*a* & *b*, *vastaria*, Chr., pl. vi. fig 7, *cuprinaria*, Chr., pl. vi. figs. 8*a* & *b* ; *Lithostege* (*Anaitis*) *excelsata*, Ersch., pl. vi. fig. 12, *L. usgentaria*, Stgr., pl. vi. fig. 11 ; *Cidaria fluctuata*, L. ; *Eupithecia gueneata* var. *separata*, Stgr., p. 133, pl. vii. figs. 2 & 3.

Stegania ? allongata, Feld., should probably be placed in *Macariidæ* ; *Cidaria lucidulata*, Walk., transferred to *Chrysolarentia*, Butl. ; *Larentia laticostata*, Walk. (= *Scotosia canata*, Walk.), and therefore becomes a *Phryssogonus* ; Rosk., Ann. N. H. (5) xvi. pp. 430 & 431.

The following names previously recorded as species inhabiting New Zealand are to be erased from the New Zealand list, because they are Australian and probably not Neozealandian : *Panagra hypenaria*, Gn., *P. promelanaria*, Walk., *Camptogramma correlata*, Walk., *Coremia casta*, Butl. ; while other names are not to be recognized at all, viz. : *Ischalis thermochromata*, *Larentia infusata*, *Coremia robustaria*, and *Cidaria rudisata*, Walk. Meyr., Tr. N. Z. Inst. xvii. pp. 66 & 67.

Ipana leptomera, Walk. (= *Amphitape crassitibia*, Feld., = *Declana crassitibia*, ♀, Meyr.) ; *id. ibid.*

Declana (sub *Politeia*) *junctilinea*, Walk. (= *Chlenias verrucosa*, Feld., this not being *D. floccosa*, as previously recorded ; also = *D. crassitibia*, ♂, Meyr.) ; *id. t. c.* p. 65.

Angerona prunaria, on breeding varieties of; Ent. xviii. p. 253.

Selenia illunaria: ontogeny of larva, etc.; Poulton, Tr. E. Soc. 1885, pp. 309–318. *S. bilunaria*, Esp.: pupation in Arctic region noticed; Sand., B. E. Z. xxix. p. 262.

Crocallis tusciaria var. n. *gaigeri* and its larva, Dalmatia; Stgr., S. E. Z. xlvi. p. 349.

Lyrcæa alectoraria, Walk. (= *Ennomos ustaria*, Walk., but not *Aspilates primata* and *Endropia mixtaria*, Walk., which names, having no locality, are to be dropped); Meyr., Tr. N. Z. Inst. xvii. p. 65.

Pygmæna fusca, Thnbg.: metamorphoses; Sand., B. E. Z. xxix. p. 264.

Nemoria viridata, food-plant of, discussed; Speyer, S. E. Z. xlvi. p. 91.

Acidalia robiginata, figs. 2 & 3, *asellaria*, figs. 4 & 5, pl. ii.: notes on these and their larvæ; Mill., Ann. Soc. Ent. Fr. (6) v. p. 115. *A. virgularia* var. n. *afra*, Algeria; Baker, Ent. M. M. xxi. p. 243. *A. rubraria*, Dbld. (= *repletaria* and *attributa*, Walk.); Meyr., Tr. N. Z. Inst. xvii. p. 63.

Hippolyte rubropunctaria, Dbld. (= *Acidalia pulchraria*, Walk. & Butl., *nec Asthena pulchraria*, Dbld.); *id. ibid.*

Thamnonoma aequiaria, note on, with fig. of ♂; Mill., Ann. Soc. Ent. Fr. (6) v. p. 116, pl. ii. fig. 8.

Amastris (sub *Macaria*) *humeraria*, Walk. (= *Lozogramma obtusaria*, Walk., = *Cidaria flexata* and *obtruncata*, *id.*, = *Sestra fusiplagiata*, *id.*, = *A. encausta*, Meyr.); Meyr., Tr. N. Z. Inst. xvii. p. 66.

Phasiane clathrata, L.: aberration; Kautz, S. E. Z. xlvi. p. 47.

Larentia lucidata, Walk. (= *L. psamathodes*, Meyr., = *Coremia plurimata*, Walk., = *Panagra venipunctata*, *id.*); *L.* (sub *Scotosia*) *subobscurata*, Walk. (= *L. petropola*, Meyr.); *L. cinereata*, Dbld. (= *L. diffusaria*, Walk.): Meyr., Tr. N. Z. Inst. xvii. p. 64. *L. subductata*, *L. quadristrigata*, Walk., *L. falcata*, Butl., *Phibalapteryx suppressaria*, Walk., and *Samana acutata*, Butl., noticed; *id. t. c.* pp. 66 & 67.

Liodes tibiaria larva, note on, with figs.; Mill., Ann. Soc. Ent. Fr. (6) v. p. 117.

Samana, Walk. The Australian species of *Panagra*, Gn., are to stand under this genus of Walker's; Meyr., Tr. N. Z. Inst. xvii. p. 65.

Statira (sub *Fidonia*) *enysii*, Butl. (= *S. homomorpha*, Butl., which was previously erroneously identified with *Pasithea brephos*, Walk.); *id. ibid.*

Eumacaria brunneata, Pack. Larva described; Canad. Ent. xvii. p. 33.

Arsinoe subochraria, Dbld. (= *Aspilates euboliaria*, Walk.); Meyr., Tr. N. Z. Inst. xvii. p. 64.

Eus b nida (*cf.* p. 187, *ante*).

Lyg[illegible]iofedunaria var. n. *obscura*, Algeria, Baker, Ent M. M. xxi. p. 244.

Cheimatobia bram[illegible]. Ravages and remedies; Orm., Rep. viii. p. 1.

Eurydice (sub *Lare[illegible]tia?*) *rufescens*, Butl. (= *E. cymosema*, Meyr.); Meyr., Tr. N. Z. Inst [illegible] xvii. p. 63.

Eupithecia hyperbo[illegible]reata, Stgr.: pupa noticed; Sand., B. E. Z. xxix.

p. 264. *E. artemisiata* var. n. *constantina*, Algeria, Baker, Ent. M. M. xxi. p. 244. *E. nepetata*: eggs, and habits of larva; Chrétien, Bull. Soc. Ent. Fr. (6) v. p. cxlii. *E. [illegible]*, H.: parasitic hypertrophy; Speyer, S. E. Z. xlvi. p. 94.

Rhopalodes patrata, Snell., = (*lobophoraria*, Oberth.); Snell., Ent. Tijdschr. xxviii. p. 50.

Scordylia salvini, Butl., = (*Heterusia dividata*, Snell.); *id. ibid.*

Stratonice (sub *Coremia*) *euclidiata*, Gn. (= *Fidonia catapyrrha*, Butl.); Meyr., Tr. N. Z. Inst. xvii. p. 63.

Pseudocoremia melinata, Feld. (= *P. confusa*, Butl.); *id. t. c.* p. 65.

Cidaria dilutata, S. V., and *hastata* var. *hastulata*, Hb.: larvæ noticed; Sand., B. E. Z. xxix. p. 263. *C. taeniata* and *scripturata*: early stages of; Gross, S. E. Z. xlvi. pp. 375 & 376. *C. ferrugata*: from eggs of this a pair of *C. unidentaria* were bred; Speyer, S. E. Z. xlvi. p. 93. *C. sociata*, Bkh.: variation of; Sintenis, SB. Ges. Dorp. vii. pp. 124–129, and photographic plate of 13 figs. *C.* (sub *Melanthia*) *arida*, Butl. (= *chaotica*, Meyr.); Meyr., Tr. N. Z. Inst. xvii. p. 64.

Tatosoma timora, n. n. (= *T. agrionata*, Meyr., *nec* Walk.), and *T. agrionata*, Walk. (= *Cidaria transitaria* and *collectaria*, Walk., and *Sauris mistata*, Feld.); *id. ibid.*

Chalastra pellurgata, Walk. (= *Itama cinerascens*, Feld., = *Stratocleis streptophora*, Meyr.); *id. t. c.* p. 66.

New genera and species:—

Gelonia, n. n. (defined as *Boarmia* in Tr. N. Z. Inst. xvi. p. 99, but differs from that genus, as defined by Lederer, in the neuration; *Barsine*, Meyr., to be sunk as being the real *Boarmia*); Meyr., Tr. N. Z. Inst. xvii. p. 65.

Salpis (without indication of position or allies), for *S. antennata*, Magellan, p. 66, *albipunctaria*, *scodoniata*, Patagonia, p. 67, spp. nn.; Mab., Bull. Soc. Philom. (7) ix.

Synneuria (near *Aspilates*), p. 67, for *S. virgellata*, Patagonia, sp. n., p. 68; *id. t. c.*

Acodia, near *Coremia*, for *A. pauper*, S. Australia, sp. n., pl. xi. fig. 7; Rosk., Ann. N. H. (5) xvi.

Epione limaria, Transcaucasus, Chr., Rom. Mém. ii. p. 97, pl. v. fig. 6.

Eurymene viridimacularia, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 46, pl. ii. fig. 6.

Odontopera australis, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 428, pl. xi. fig. 9.

Ennomos hyadesii, Magellan, Mab., Bull. Soc. Philom. (7) ix. p. 65.

Colussa vinosa, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 384.

Hypochroma paulinaria, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 47 (? the same as *H. rhadamaria*, Guen.; *id.* p. 180).

Psodos quadrisectaria, Magellan, Mab., Bull. Soc. Philom. (7) ix. p. 68.

Gnophos annubilata, Transcaucasus, Chr., Rom. Mém. ii. p. 103, pl. v. fig. 7.

Ophthalmophora bracteata, Petropolis, Butl., Ent. M. M. xxi. p. 199.

Acidalia hyalinata, Transcaucasus, Chr., Rom. Mém. ii. p. 89, pl. v. fig. 3; *A. mesklaria*, Algeria, Oberth., Bull. Soc. Ent. Fr. (6) iv. p. cxxiii.; *A. italicata*, Italy, Mill., Ann. Soc. Ent. Fr. (6) v. p. 113, pl. 2, fig. 1; *A. mauritanica*, p. 243, *terentius*, p. 244, Algeria, Baker, Ent. M. M. xxi.

Idæa farinalis, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 430; *I. jacta*, Kurrachee, Swinh., P. Z. S. 1884, p. 526, pl. xlviii. fig. 12.

Erosia hyperbolica, Kurrachee, *id. t. c.* p. 528, pl. xlviii. fig. 15.

Tephrina arenaria, Kurrachee, *id. t. c.* p. 527, pl. xlviii. fig. 13; *T. sublimbata*, Aden, Butl., P. Z. S. 1884, p. 502; *T. ossea*, Afghanistan, Swinh., Tr. E. Soc. 1885, p. 353, pl. ix. fig. 9; *T. biskraria*, Algeria, Oberth., Bull. Soc. Ent. Fr. (6) iv. p. cxxxiv.

Larentia multivirgulata, *semilotaria*, Magellan, Mab., Bull. Soc. Philom. (7) ix. p. 70.

Scodiona tekkearia, Achal-Tekke, Chr., Rom. Mém. ii. p. 123, pl. iv. fig. 4.

Fidonia hedemanni, Achal-Tekke, *id. t. c.* p. 121, pl. vi. fig. 3; *F. albofascia*, Kurrachee, Swinh., P. Z. S. 1884, p. 527, pl. xlviii. fig. 14.

Aspilates smirnovi, Tiflis, Rom., Rom. Mém. ii. p. 106, pl. v. fig. 8; *A. innocentaria*, Achal-Tekke, Chr., *t. c.* p. 125, pl. vi. fig. 5; *A. glyphicarius*, p. 66, *citrinarius*, p. 67, Magellan, Mab., Bull. Soc. Philom. (7) ix.

Hippoplectis disticlaria, Magellan, *id. t. c.* p. 67.

Panaethia inculpata, Nias I., Weym., S. E. Z. xlvi. p. 282, pl. ii. fig. 4.

Chlenias seminigra, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 430.

Eupithecia scalptata, p. 134, pl. vii. fig. 4, *demetata*, p. 136, pl. vii. fig. 5, *stigmaticata*, p. 137, pl. vii fig. 6, *cingulata*, p. 139, pl. vii. fig. 7, Achal Tekke, Chr., Rom. Mém. ii.; *E. sydyi*, Kuldja, Stgr., S. E. Z. xlvi. p. 351.

Lobophora stenopterata, *oculata*, Magellan, Mab., Bull. Soc. Philom. (7) ix. p. 68.

Rhopalodes muscosaria, Buenos Aires, Berg, An. Soc. Arg. xix. p. 273.

Harpalyce parora, n. n. (= *humeraria*, Moyr., *nec* Walk.); Moyr., Tr. N. Z. Inst. xvii. p. 63.

Casbia melanops, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 431, pl. xi. fig. 10.

Triphosa pustularia, *badiaria*, California, Edw., Ent. Am. i. p. 50.

Cidaria perornata, no locality, *mutabilis*, Magellan, p. 69, Mab., Bull. Soc. Philom. (7) ix.; *C. bigeminata*, Achal-Tekke, Chr., Rom. Mém. ii. p. 131, pl. vii. fig. 1.

Ortholitha langi, p. 108, pl. v. figs. 9*a* & *b*, *kawrigini*, pl. v. fig. 10, p. 110, Transcaucasus, *id. t. c.*

Eubolia undulata, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 432.

Coremia languescens, S. Australia, *id. t. c.* p. 433, pl. xi. fig. 8.

Lithostege luminosata, p. 127, pl. vi. fig. 9, *amœnata*, p. 128, pl. vi. fig. 10, Achal-Tekke, Chr., Rom. Mém. ii.

SICULODIDÆ.

Noctuelia alticolalis, Chr., figured ; Rom. Mém. ii. pl. xii. fig. 7.

p. 264. *E. artemisiata* var. n. *constantina*, Algeria, Baker, Ent. M. M. xxi. p. 244. *E. nepetata*: eggs, and habits of larva; Ch[illegible] Bull. S. c. Ent. Fr. (6) v. p. cxlii. *E. intybata*, H.: parasitic hypertrophy; Speyer, S. E. Z. xlvi. p. 94.

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Acodia, near *Coremia*, for *A. pauper*, S. Australia, sp. n., pl. xi. fig. 7; Rosk., Ann. N. H. (5) xvi.

Epione limaria, Transcaucasus, Chr., Rom. Mém. ii. p. 97, pl. v. fig. 6.

Eurymene viridimaculatia, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 46, pl. ii. fig. 6.

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Ortholitha langi, p. 108, pl. v. figs. 9*a* & *b*, *kawrigini*, pl. v. fig. 10, p. 110, Transcaucasus, *id. t. c.*

Eubolia undulata, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 432.

Lithosia languescens, S. Australia, *id. t. c.* p. 433, pl. xi. fig. 8.

fig. 10, Achal-Tekke, Chr., Rom. Mém. ii.

SICULODIDÆ.

Noctuelia alticolalis, Chr., figured; Rom. Mém. ii. pl. xii. fig. 7.

Pyralidæ.

[*Cf.* Meyrick (215, 217, 218), Wood-Mason (371)].

Catalogue of the known larvæ of European *Pyralidæ*; Roüast, Ann. Soc. L. Lyon (n.s.) xxx. pp. 70–81.

Pyralopsis divisa, Boisd. (*cf. Lithosiidæ*, p. 188).

Christoph, in Rom. Mém. ii. pp. 141-149, notices or figures *Asopia obatralis*, Chr., pl. vii. fig. 9; *Anthophilodes baphialis*, Ld., of which *plumbiferalis*, Chr., is only an aberration, p. 144; *A. turcomanica*, pl. vii. fig. 10; *Botys trinalis* var. *pontica*, Stgr., pl. vii. fig. 12; *Eurycreon scalaralis*, Chr., pl. vii. fig. 13.

Eurrhyparodes bracteolalis, Zell. (= *accessalis*, Walk., = *stibialis*, Snell.); *Molybdantha tricoloralis*, Zell. (= *plumbalis*, Gn., = *abnegatalis*, Walk.); *Sameodes* (sub *Botys*) *cancellalis*, Zell. (= *piplesialis*, Walk., = *lepidalis*, *ib.*, = *sidealis*, *ib.*, = *meridionalis*, *ib.*, = *trithyralis*, Snell., = *vespertinalis*, Saalm.): Meyr., Ent. M. M. xxi. p. 202.

Balanotis. *Cardamyla*, Led., being founded on deficient observation, exists only as synonym of this; Meyr., Tr. E. Soc. 1885, p. 440.

Lepyrodes and *Lonchodes*. Corrected characters of these given by Meyr., *t. c.* p. 442.

Proterœca comastis, Meyr. [*vide* Zool. Rec. xxi. *Ins.* p. 239], add locality New Zealand; *id. t. c.* p. 456.

Asopia (*Pyralis*) *farinalis*. Life-history; Hellins, Ent. M. M. xxi. p. 248. Recorded from New Zealand; Meyr., Tr. N. Z. Inst. xvii. p. 122.

Damalis sericea, Moore. Larva noticed; Swinh., P. Z. S. 1885, p. 292.

Endotricha pyrosalis, Guén., to be retained in *Messatis*; *Eurycreon familiaris*, Meyr., is probably *Scopula segestusalis*, Walk.: Rosk., Ann. N. H. (5) xvi. p. 427.

Diasemia grammalis, Doub., = (*spilonotalis*, Snell.); Snell, Ent. Tijdschr. xxviii. p. 42.

Cataclysta ochracealis, Walk. (= *Diptychophora præmaturella*, Meyr.), and *Ancylolomia ruptella*, dubious position of, noticed; Rosk., Ann. N. H. (5) xvi. pp. 435 & 436.

Paraponyx polydectalis (*Cataclysta*), Walk., and *P. decussalis* (*Zebronia*), redescribed, *Z. medusalis*, Walk., being a synonym of latter; Meyr., Tr. E. Soc. 1885, pp. 430–433.

Noorda is allied to *Glyphodes*; *N. blitealis*, Walk. (= *Scopula? subjectalis*, Walk.): Butl., P. Z. S. 1884, p. 501.

Cacozelia costigeralis (*Pyralis*), Walk., redescribed; Meyr., Tr. E. Soc. 1885, p. 439.

Botys hyalinalis: embryology of; Osborne, Sci. Goss. xxi. p. 32, and woodcuts. *B. zealis*, Guén. (= *B. varialis*, Bremer); *B. multilinealis* Guén. (= *B. basipunctalis*, Bremer): Oberth., Bull. Soc. Ent. Fr. (5) v. p. lvii.

Hyalitis luctuosalis, Guén. (= *Ebulea* [illegible] *leri*, Bremer); *id. ibid.*

Eurycreon, Ld. Characters supplemented, p. 449; *Botys ptousalis*, Walk., does not belong to the genus but to *Myriotis* (*infrà*), p. 446: Meyr., Tr. E. Soc. 1885.

Godara, Walk., is doubtfully distinct from *Orobena*, Gn., and *Pionea incomalis*, Gn., is ♀ of *comalis*, Gn. ; *id. t. c.* p. 444.

Eudorea frequentella var. (= *portlandica*, Dale); Staint., Ent. M. M. xxi. p. 275.

Nyctarcha, Meyr. *Orosana atra*, Butl., belongs to this ; Meyr., Tr. N. Z. Inst. xvii. p. 70.

Scoparia ustimacula, Feld. (= *S. conifera*, Butl.), p. 91; *S. submarginalis* (sub *Hypochalcia*), Walk. (= *Nephopteryx maoriella*, Walk.), p. 95 ; *S.* (sub *Hypochalcia*) *indistinctalis*, Walk. (= *S. rakaiensis*, Knaggs), p. 97 ; *S. feredayi*, Knaggs (= *S. moanalis*, Feld.), p. 100; *Scopula cleodoralis*, Walk., is a *Scoparia*, p. 101 ; as also, p. 106, *Crambus sabulosellus*, Walk., and, p. 107, *C. trivirgatus*, Feld. : Meyr., Tr. N. Z. Inst. xvii.

Erotomanes. Genus fully described ; *Canuza euspilella*, Walk. (= *Anerastia mirabilella*, Meyr.), belongs to it : *id.* Tr. E. Soc. 1885, p. 451.

New genera and species :—

Tyspana, for *T. vitessoides*, Ceylon, sp. n., pl. clxxviii. figs. 3 & 3*a* ; Moore, Lep. Ceyl. iii. p. 256.

Letchena, type *Pyralis thyralis*, Walk. ; *id. t. c.* p. 257.

Bocchoris, type *Botys inspersalis*, Zell. ; *id. t. c.* p. 271.

Danaga, for *Desmia concisalis*, Walk. ; *id. t. c.* p. 272, pl. clxxix. fig. 3.

Cotachena, for *Botys histricalis*, Walk. ; *id. t. c.* p. 275.

Gadessa, p. 278, for *G. albifrons*, Ceylon, sp. n., p. 279, pl. clxxx. fig. 6 ; *id. t. c.*

Mabra, type *Asopia eryxalis*, Walk ; *id. t. c.* p. 280.

Bacotoma, for *Botys abjungalis*, Walk. ; *id. t. c.* p. 282.

Ravanoa, type *Zebronia bilineolalis*, Walk. ; *id. t. c.* p. 284.

Acharana, p. 285, type *Botys otreusalis*, Walk., and including *A. similis*, Ceylon, p. 286, sp. n.

Talanga, for *Oligostigma sexpunctata*, Moore, and including the Australian *Leucochroma tolumnialis*, Walk. ; *id. t. c.* p. 300.

Drymiarcha, near *Œlematophaga*, for *D. exanthes*, sp. n., Australia ; Meyr., Tr. E. Soc. 1885, p. 441.

Xestula, near *Anaglis*, Led., for *X. miraculosa* (*Euxestis ? miraculosa*, Stgr., i. litt.), sp. n., Amurland ; Snellen, Rom. Mém. ii. pp. 195–200, pl. xi.

Hygraula, near *Cataclysta*, Meyr., Tr. N. Z. Inst. xvii. p. 129 ; for *Paraponyx nitens*, Butl. *Hygraula*, Meyr., founded on insufficient observation, to be merged in *Paraponyx* ; *id.* Tr. E. Soc. 1885, p. 434.

Anydraula, p. 427, for *Cataclysta glycerialis* and *drusiusalis*, Walk., which are redescribed, pp. 428 & 429 ; *id. t. c.*

Hydreuretis, between *Paraponyx* and *Schœnobius*, p. 435, for *Hydrocampa tullialis*, Walk., and *H. euryscia*, sp. n., Australia ; *id. t. c.*

Oxychirota, for *O. paradoxa*, sp. n., Australia, p. 438 ; *id. t. c.* *Oxychirotidæ* briefly defined, p. 437.

Hydiris, p. 443, for *H. chalybitis*, sp. n., Australia, p. 444 ; *id. t. c.*

Hyalobathra, near *Botys*, for *H. archeleuca*, sp. n., Australia ; *id. t. c.* p. 445.

Myriotis, near the preceding, for *Botys ptousalis*, Walk. (= *Osiriaca inturbidalis*, *id.*); *id. t. c.* p. 447.

Stereocopa, near *Notarcha*, p. 448, for *Gabrisa scoparialis*, Walk.; *id. t. c.*

Pyralis uberalis, Kurrachee, Swinh., P. Z. S. 1884, p. 523, pl. xlviii. fig. 10; *P. imbecilis*, Moore, Lep. Ceyl. iii. p. 264.

Vitessa rama, *id. t. c.* p. 256, pl. clxxviii, fig. 4.

Stemmatophora castanoptera, *id. t. c.* p. 260, pl. clxxviii. fig. 7.

Rhodoneura denticulosa, *id. t. c.* p. 267.

Pelecyntis distorta, *id. t. c.* p. 270, pl. clxxx. fig. 7.

Naroleia costisignalis, *contingens*, pl. clxxix. fig. 8, *id. t. c.* p. 273.

Hedylepta straminea, *id. t. c.* p. 278.

Leucinodes opalina, *id. t. c.* p. 289.

Coptobasis fraterna, *id. t. c.* p. 292, pl. clxxxi. fig. 8.

Cataclysta ornata, p. 299, *cuneifera*, pl. clxxix. fig. 14, *angulata*, pl. clxxxi. fig. 12, p. 300, *id. t. c.*

Chrysauge unicolor, Argentine Rep., Berg, An. Soc. Arg. xix. p. 274.

Hypotia vafera, pl. xlviii. fig. 8, *rubella*, fig. 9, p. 523, Kurrachee, Swinh., P. Z. S. 1884; *H. speciosalis*, Achal-Tekke, Chr., Rom. Mém. ii. p. 141, pl. vii. fig. 8.

Eunychia arabica, Aden, Butl., P. Z. S. 1884, p. 500.

Arsacia frontirufa, Bombay, Swinh., P. Z. S. 1885, p. 301, pl. xx. fig. 12.

Damalis onusta, Nias I., Weym., S. E. Z. xlvi. p. 276, pl. ii. figs. 6 ♀, & 7 ♂.

Paraponyx diventra, p. 431, *myina*, p. 432, Australia, Meyr., Tr. E. Soc. 1885; *P. oryzalis*, Wood-Mason (371).

Margaronia woodfordii, Gilbert I., Butl., Ann. N. H. (5) xv. p. 241.

Catamola capnopis, Australia, Meyr., Tr. E. Soc. 1885, p. 439.

Botys aurithoracalis, Achal-Tekke, Chr., Rom. Mém. ii. p. 145, pl. vii. fig. 11; *B. quinquemaculalis*, p. 54, *murinalis*, p. 55, *flavoviolalis*, p. 56, Ins. Nias, Pagen., JB. nass. Ver. xxxviii. p. 57; *B. inornatalis*, Florida, Fernald, Canad. Ent. xvii. p. 57.

Eurycreon pechi, Algeria, Baker, Ent. M. M. xxi. p. 268; *E. homophæa*, Australia, Meyr., Tr. E. Soc. 1885, p. 449; *E. perplexalis*, Texas, Fernald, Canad. Ent. xvii. p. 57.

Scopula palmalis, Kurrachee, Swinh., P. Z. S. 1884, p. 525, pl. xlviii. fig. 11.

Lonchodes ceramochra (to which *Botys mannusalis*, Walk., is probably close), Australia, Meyr., Tr. E. Soc. 1885, p. 443.

Mecyna rhodochrysa, Australia, *id. t. c.* p. 447.

Myriostephes heliamma, Australia, *id. t. c.* p. 448.

Orobena grummi, Achal-Tekke, Chr., Rom. Mém. ii. p. 147, pl. vii. fig. 14.

Scoparia pusilla, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 427; *S. chiasta*, p. 74, *eumeles*, *aphrodes*, p. 75, *epicryma*, p. 76, *syntaracta*, p. 77, *homala*, *eremitis*, p. 79, Australia, *spelæa*, p. 89, Australia and Tasmania, *anthracias*, p. 74, *synapta*, p. 78, *perierga*, *gomphota*, p. 80, *acropola*, p. 101, Tasmania, Meyr., Tr. N. Z. Inst. xvii.; and the following from New Zealand: *S. oreas* and *philerga*, p. 81, *chlamydota*, p. 82,

chimeria, p. 84, *dinodes* and *acharis*, p. 85, *cymatias*, p. 86, *micropthalma* and *hemicycla*, p. 87, *ergatis*, *critica*, p. 88, *characta*, p. 90, *melanægis*, p. 92, *trapezophora*, *philetaera*, p. 93, *periphanes*, p. 94, *cataxesta*, p. 96, *chalicodes*, *leptalea*, p. 98, *psammitis*, *epicomia*, p. 99, *accompa*, p. 100, *manganeutis*, *cyrpsinoa*, p. 102, *axena*, *steropæa*, p. 103, *elaphra*, *paltomacha*, p. 105, *panopla*, p. 107 (a few of these were, however, previously described in N. Z. J. Sci. ii.; *cf.* Zool. Rec. xxi. *Ins.* p. 240). *S. protorthra*, Australia, Meyr., Tr. E. Soc. 1885, p. 450.

Xeroscopa petrina, p. 111, *cyamenta*, p. 112, *astragalota*, p. 113, *harpalea*, p. 114, *niphospora*, *apheles*, *aspidota*, p. 115, *nomeutis*, p. 116, *epicremna*, *legnota*, p. 117, *octophora*, *asterisca*, p. 118, *leucogramma*, p. 119, New Zealand, *philonephes*, p. 110, Australia, *encausta*, p. 111, Tasmania, Meyr., Tr. N. Z. Inst. xvii. (a few of these were, however, previously described in N. Z. J. Sci. ii.; *cf.* Zool. Rec. xxi. *Ins.* p. 240).

Crambidæ.

[*Cf.* Ragonot (265), Snellen (324).]

Hoffer, E. Biologisches über *Aphomia colonella*, L. Kosmos, xvi. pp. 109–113.

Some observations on the habits of this Moth.

Ilithyia to be treated as synonym of *Aphomia*; Ragt., Ent. M. M. xxii. p. 21.

Melissoblaptes cephalonica, St. Importation into Hamburg; Sorh., B. E. Z. xxix. p. 82.

Erschoff, Rom. Mém. ii. pl. xvi. figures ? *Catastia umbrosella*, Ersch., fig. 7, *Hypochalcia caminariella*, fig. 8, *Eucarphia gregariella*, fig. 9.

Ampycophora, Meyr., to be suppressed in *Etiella*, Z., having been founded on mutilation; Meyr., Tr. E. Soc. 1885, p. 455.

Acrobasis zelleri, Ragt., n. n. for *tumidella*, Zk., and *A. tumidana*, S.V. (= *rubrotibiella*, F.); Ragt., Ent. M. M. xxii.

Myelois cribrella, Hb. (= *cribrum*, S. V.), p. 29, *M. marmorea*, Hw. (= *epelydella*, Z.), *M. ceratoniæ*, Z. (= *pryerella*, Vaugh.), p. 30; Ragt., *t. c.* *M. advenella*, Zck., larva described; *M. epelydella*, *id.*, larva noticed: Sorh., B. E. Z. xxix. p. 81.

Metœcis lepidocerella, Mab. (= *Zophodiopsis hyænella*, Fromholz); Ragt., Bull. Soc. Ent. Fr. (6) v. p. xlii.

Eucarphia tritalis, Walk. (= *cnephælla*, Meyr.); Meyr., Tr. E. Soc. 1885, p. 455.

Ephestia. Several species noticed; Tijdschr. Ent. xxviii. p. xcv. *E. elutella*: habits; Gard. Chron. (2) xxiii. p. 800 (woodcut). *E. calidella*, Gn., = (*ficella*, Dgl., = *xanthotricha*, Stgr.); *E. cahiritella*, Zell., = (*passulella*, Bart.): Ragt., Ent. M. M. xxii. p. 24. *E. kuhniella*, Zell., note on; Verh. Ver. Rheinl (5) 2, pp. 50–52: observations on the imago, larva, &c., and its occurrence in Nassau; Pagen., JB. nass. Ver. xxxviii. pp. 114–118: it and allies noticed at length, and metamorphoses of former figured; Snellen (324): ravages, *cf.* also *Economic*, *ante*, p. 56.

Epischnia staminella, Chr., pl. viii. fig. 4, *Myelois terstrigella*, Chr.,

pl. viii. fig. 5, figured; Rom. Mém. ii. *E. boisduvaliella*, Gn. (= *Anerastia farrella*); Ragt., Ent. M. M xxii. p. 23.

Cryptoblabes bistriga (= *Ephestia lugdunella*, Mill.), p. 19; *Homœosoma cretacella*, Rossl. (= *senecionis*, Vaugh.), p. 26; *Euzophera* (*Myelois*) *cinerosella*, Z. (= *M. artemisiella*, Staud.), p. 30; *Hypochalcia ahenella*, S. V. (= *obscuratus* and *tetrix*, Hw., and *bistrigella* and *fuliginella*, Dup.); *Gynancycla canella*, S. V. (= *depositella*, Zk., = *cinnamomella*, Mill.), p. 32; *Dioryctria decuriella*, Hb. (= *Nephopteryx abietella*, Z.), *Phycita spissicella*, F. (= *Nephopteryx roborella*, Z., = *legatea*, Hw., and *legatella* and *cristella*, Stph.), p. 52; *Salebria semirubella*, Sc. (= *P. carnella*, L., auct.), p. 53; *S.* (sub *Pempelia*) *fusca*, Hw. (= *janthinella*, Dup.), p. 54; *Nephopteryx genistella*, Dup. (= *ulicella*, H.-S., = *albilineella*, Stgr., = *davisellus*, Newm., = *P. albariella*, Knaggs), p. 53; *Pempelia ornatella*, S. V. (= *dilutella*, Hb., &c.), p. 53; *P. adornatella*, Tr. (= *dilutella*, Staint.), pp. 53 & 54: Ragt., Ent. M. M. xxii.

Diptychophora. *Eromene bipunctella*, Walk., and *Crambus interruptus*, Feld., belong to this genus, and *D. astrosæma*, Meyr., is a synonym of the latter; Meyr, Tr. N. Z. Inst. xvii. pp. 130 & 132. *D. elaina*, Meyr., is noticed, p. 132, and it is considered probable, p. 133, that *D. amœnella*, Snellen, does not belong to the genus.

Crambus furcatellus, Zett., metamorphoses of; Sand., B. E. Z. xxix. p. 264.

Ancylolomia ruptella, doubt as to position of; Rosk., Ann. N. H. (5) xvi. p. 436.

Prionopteryx (*Eromene*) *subscissa*, Chr., figured and noticed; Chr., Rom. Mém. ii. p. 152, pl. viii. fig. 3.

New genera and species:—

Harpagoneura, near *Melissoblaptes*, for *H. complexa*, sp. n., Ellice I.; Butl., Ann. N. H. (5) xv. p. 242.

Hornigia, for *Melissoblaptes anellus*; Ragt., Ent. M. M. xxii. p. 21.

Coreyra, for *Melissoblaptes cephalonica*, Stt.; *id. t. c.* p. 23.

Heterographis, n. n. for various species, of which *Euzophera oblitella*, Z., is one, and (= *Nephopteryx undulatella*, Clem.); *id. t. c.* p. 31.

Thylacoptilia, near *Nephopteryx*, p. 105, for *T. paurosema*, sp. n., p. 106, Cape Verde Is.; Meyr., Ent. M. M. xxii.

Commotria, near *Ematheudis*, for *C. invenustella*, sp. n., Argentine Rep.; Berg, An. Soc. Arg. xix. p. 278.

Orocrambus, p. 133, for *O. melampetrus*, sp. n., New Zealand; Meyr., Tr. N. Z. Inst. xvii. [*cf.* Zool. Rec. xxi. *Ins.* p. 241].

Sorocostia, near *Plochostola*, for *Eromene? vetustella*, Walk.; Rosk., Ann. N. H. (5) xvi. p. 435.

Mella yerburii, Aden, Butl., P. Z. S. 1884, p. 502.

Acrobasis vaccinii, with metamorphoses, pl. ix. fig. 4; history and description, pp. 355, 356, 394, & 395; Riley, Rep. Ent. 1884 [*cf.* Zool. Rec. xxi. *Ins.* p. 241].

Lasiocera antelia, Australia, Meyr., Tr. E. Soc. 1885, p. 455.

Salebria minutella, Ceylon, Rag., Bull. Soc. Ent. Fr. (6) v. p. cl.

Pempelia ilella, Swinh., P. Z. S. 1884, p. 529, pl. xlviii. fig. 6.

Spermatophthora schini, Buenos Aires, Berg, An. Soc. Arg. xix. p. 275.
Zophodia cactorum and larva, Argentine Rep., *id. t. c.* p. 276.
Anerastia (*Mesodiphlebia*) *trinotella*, Argentine Rep., *id. t. c.* p. 279.
Diptychophora selenea, *holanthes*, p. 131, *epiphæa*, p. 132, New Zealand, Meyr., Tr. N. Z. Inst. xvii.
Crambus catacaustus, *tritonellus*, p. 134, *ephorus*, *crenæus*, p. 135, *encophorus*, *diplorrhous*, p. 136, *pedias*, *paraxenus*, p. 137, *sophronellus* and *oncolobus*, p. 138, New Zealand, *id. t. c.*; *C. zeellus*, Pennsylvania, &c., p. 55, *hastellus*, Texas, p. 56, Fernald, Canad. Ent. xvii.; *C. biradiellus*, Magellan, Mab., Bull. Soc. Philom. (7) ix. p. 70; *C. zonellus*, Kurrachee, Swinh., P. Z. S. 1884, p. 528, pl. xlviii fig. 16; *C. kobelti*, Algeria, Saalm., S. E. Z. xlvi. p. 335, pl. (unnumbered), fig. 12.
Chilo concolorellus, p. 149, pl viii. figs. 15*a* & *b*, *terrestrellus*, p. 151, pl. viii. fig. 2, Achal-Tekke, Chr., Rom. Mém. ii.
Thinasotia termia, p. 452, *pedionoma*, *panteucha*, p. 453, *pedalarcha*, p. 454, Australia, Meyr., Tr. E. Soc. 1885.

TORTRICIDÆ.

[*Cf.* Meyrick (219).]
Catalogue of the known larvæ of European *Tortricidæ*; Roüast, Ann. Soc. L. Lyon (n.s.) xxx. pp. 81–95.
On the value of the costal fold in the classification of; Barrett, Ent. M. M. xxii pp. 1–16.
Christoph, in Rom. Mém. ii. pp. 155–157, notices or figures *Oxypteron impar*, Stgr., pl. viii. figs. 6*a* & *b*; *Conchylis margaritana*, Hb.; *C. zelleri*, Chr., pl. viii. fig. 7.
Erschoff figures on pl. xvi., Rom. Mém. ii., the following of his previously described species:—*Tortrix excentricana*, fig. 10, *Cheimatophila præviella*, fig. 11, *Cochylis pistrinana*, fig. 12, *Penthina enercana*, fig. 13, *Grapholitha abacana*, fig. 14, *subterminana*, fig. 15, *Phthoroblastis dorsiluna*, fig. 16.
Note on galls of *Cecidoses eremita*, Curt.; Ent. Nachr. xi. p. 130.
Teras oxycoccana, Pack. Experiment on dimorphism of, &c.; Riley, Rep. Ent. 1884, p. 395.
Dichrorhampha tanaceti, *herbosana*, *saturnana*. Note on; Ent. M. M. xxi. p. 190.
Tortrix cratægana, H.: larva noticed; Sorh., B. E. Z. xxix. p. 82. *T. ministrana*: occurrence of dark variety of this and some other *Lep.* at Hamburg; *id. t. c.* p. 83. *T. prodromana*, H., noticed; *id. ibid.* *T. ingetana*, Christ., = (*subrufana*, Snell.); Snell., Tijdschr. Ent. xviii. p. 203.
Tortricodes hyemana: habits and description of larva; Ent. M. M. xxi. p. 253.
Heterocrossa, Meyr., commented on; Meyr., Tr. N. Z. Inst. xvii. p. 148.
Cochylis badiana, H., noticed, and larva described; Sorh., B. E. Z. xxix p. 83.
Retinia posticana, Zett., noticed; *id. t. c.* p. 84.
Cymolamia hartigiana, Rtzb., noticed; *id. ibid.*

Habits of larvæ of *Coccyx tædana* and *Euchromia flammeana* and *arbutana*; Ent. M. M. xxii. p. 65.

Phlœodes tetraquetana: habits and description of larva; *op. cit.* xxi. p. 253.

Grapholitha hohenwartiana, Tr.: larva described; Sorh., B. E. Z. xxix. p. 84. *G. messingiana*, Fisch., = (*lignana*, Snell.); Snell., Tijdschr. Ent. xxviii. p. 203. *G. prunivora*, Walsh: defect in instinct of; Riley, Rep. Ent. 1884, p. 418. *G. cæcana*: larva described; Ent. xviii. p. 218.

Padisca oppressana: larva and habits; Ent. M. M. xxii. p. 151.

Rhophobota geminana, Wck.: the earlier notice of *fractifasciana* and *nævana* (B. E. Z. xxvi. p. 142) referred really to this; Sorh., B. E. Z. xxix. p. 85.

Phthoroblastis argyrana, H., and larva, noticed; *id. ibid.* *P. trauniana*, Schiff., and *regiana*, Z., note on; the former bred from fruits of *Acer campestris*: Hoffmann, S. E. Z. xlvi. pp. 310–312.

Steganoptycha ratzeburgiana, Sax.; ravages, larva, &c.; Riley, Rep. Ent. 1884, pp. 378 & 379. *S. pygmæana*, H., noticed; Sorh., B. E. Z. xxix. p. 85.

Phoxopteryx curvana, Z.: occurrence at Hamburg; *id. t. c.* p. 86.

Uraba lugens, Walk., transferred to *Cymatophoridæ*; Rosk., Ann. N. H. (5) xvi. p. 423.

Harmologa oblongana, Walk.: larva described; Meyr., Tr. N. Z. Inst. xvii. p. 144.

Proselena. *Harmologa zatrophana*, Meyr., belongs to this, and ♂ is described; *id. ibid.*

Epalxiphora, Meyr., amended description of; *id. t. c.* p. 146: and of *E. axenana*, p. 147.

New genus and species:—

Ctenopseustis, for *Padisca obliquana*, Walk.; Meyr., *t. c.* p. 146.
Conchylis unicolor, Algeria, Baker, Ent. M. M. xxi. p. 268.
Steganoptycha luedersiana, Hamburg., Sorh., Ent. Nachr. xi. p. 284.
Pyrgotis eudorana, New Zealand, Meyr., Tr. N. Z. Inst. xvii. p. 143.
Proselena elephantina, p. 143, *eremana*, p. 144, New Zealand, *id. t. c.*
Harmologa latomana, *sirœa*, New Zealand, *id. t. c.* p. 145.
Cacœcia alopecana, New Zealand, *id. t. c.* p. 147.
Heterocrossa cryodana, p. 148, *eponiana*, p. 149, New Zealand, *id. t. c.*

Tineidæ.

[*Cf.* Meyrick (214).]

Catalogue of the known larvæ of European *Tineidæ* (and *Micropterygidæ*); Roüast, Ann. Soc. L. Lyon (n.s.) xxx. pp. 96–149.

Hagen, H. A. The types of *Tineina* in the Collection of the Museum in Cambridge, Mass. Papilio, iv. pp. 151–154. [Deals with *Lithocolletis* and *Elachistidæ*.]

Microlepidopterous larva in fungus (*Clavaria flavalis*); Tet., B. E. Z. xxix. p. 160.

Tinea comptella, Walk, noticed; *Anthœcia divitiosa* (*Noctuidæ*), Walk. (unnoticed by Meyrick), transferred to *Hypertropha*, Meyr.; doubtful position of *Conœca*; *Heliocausta*, sub *Cryptolechia*, *tryphœnatella*, Walk. (= *C. œcophorella*, Walk.); *Philobota*, sub *Phalœna*, *fascialis*, Fab. (= *bimaculana*, Don., Meyr.): Rosk., Ann. N. H. (5) xvi. pp. 437–442.

Ochsenheimeria vacculella. Habits of larva discussed; Staint., Ent. M. M. xxii. pp. 92 & 93.

Tinea spretella, S. V.: metamorphoses; JB. Ver. Osnabr. vi. p. 168. *T. semifulvella*, Hw., and larva, noticed; Sorh., B. E. Z. xxix. p. 86.

Incurvaria vetulella, Ztt.: *argillella*, Z., is ♀ or ♀ var. of this; *id. t. c.* p. 87.

Adela albicinctella, Mn., noticed; *id. ibid.*

Nematois violellus, Z.: occurrence in N. Germany, and notice of larva; *id. ibid.* *N. metallicus*: sexual structures; Cholodkovsky (74).

Bondia nigella. Neuration noticed; Rosk., Ann. N. H. (5) xvi. p. 437.

Hyponomeuta, pupation of; Ent. M. M. xxii. p. 112.

Prays curtisellus, Don., and *rusticus*, Hw., noticed, probably really distinct species; Sorh., B. E. Z. xxix. p. 88.

Plutella hufnagelii, Z.: larva noticed; *id. t. c.* p. 89. *P. cruciferarum*, Zell.: habits in arctic regions; Saud., B. E. Z. xxix. p. 265.

Cerostoma radiatellum, Don., and *nemorellum*, L.: larvæ described; *id. t. c.* pp. 89 & 90. *C. xylostella*, ravages of; Orm., Rep. viii. p. 81.

Dasystoma salicellum, H., note on larva of; Sorh., B. E. Z. xxix. p. 91.

Exæretia allisella, St., noticed; *id. ibid.*

Depressaria applana, F., and *heracliana*, De G. (larva), noticed; *id. t. c.* p. 92.

Gelechia basiguttella, Hein., *albicans*, Hein., *scotinella*, H.-S., *cytisella*, Tr., larva of, noticed; *id. t. c.* pp. 92 & 93. *G. rumicivorella*: larva described, figured; Mill., Ann. Soc. Ent. Fr. (6) v. p. 120, pl. ii. figs. 14 & 15. *G. cerealella*: metamorphoses, pl. vi. fig. 2, ravages, fig. 3, history, parasites, remedies, &c.; Riley, Rep. Ent. pp. 345–350.

Lita acuminatella, Sirc., *moritzella*, H., *huebneri*, Hw., *maculiferella*, Dgl., *halonella*, H.-S.: larvæ noticed; Sorh., B. E. Z. xxix. pp. 93 & 94. *L. tabacella* and *solanella*, Rag., probably the same species; Rag., Bull. Soc. Ent. Fr. (6) v. p. cxi.

Teleia proximella, Hb., var. *peritella*, Corsica; Constant, Ann. Soc. Ent. Fr. (6) iv. p. 254, pl. x. fig. 15. *T. tigrina*, Chr., figured; Rom. Mém. ii. pl. viii. fig. 8. *T. triparella*, Z.: larva on *Myrica gale*; Sorh., B. E. Z. xxix. p. 94.

Argyritis pictella, Z., noticed; *id. ibid.*

Ceratophora lineolella, Z., noticed; *id. t. c.* p. 95.

Nothris asinella, H.: larva noticed; *id. ibid.* *N. limbipunctella*, vel sp. n. ?, descr. fig.; Mill., Ann. Ent. Fr. (6) v. p. 119, pl. ii. fig. 9.

Metanarsia modesta, Stgr., figured, pl. viii. fig. 10; Rom. Mém. ii.

Anchinia dolomiella, Mn. & Rgh., larva noticed; Sorh., B. E. Z. xxix. p. 95.

Pancalia leuwenhoekella and *latreillella*: are they the sexes of one

species ? Stainton, Ent. M. M. xxi. pp. 193–197 [*cf.* Snell., Tijdschr. Ent. 1877, pp. 85–89].

Meyrick, P. Linn. Soc. N. S. W. ix. pp. 1045–1082, gives full descriptions of the following genera of *Œcophorides*, which have appeared previously only in tabulation: *Brachynemata*, *Microbela*, *Heterozyga*, *Oxythecta*, *Crepidosceles*, *Oecystola*. The following species are redescribed: *Oxythecta alternella*, Walk., *acceptella*, Walk. (= *Œcophora connexella*, Walk., and ? *Cryptolechia abstersella*, *id.*), the confusion as to the latter being specially noticed; *Oecystola paulinella*, Newm., *suppressella*, Walk.

Philobota [*cf.* Zool. Rec. xx. *Ins.* p. 232], Meyr., characters of, p. 469. The following known species referred to it and described: *P.* (*Œ.*) *arabella*, Newm., (*Œ.*) *irruptella*, Z., (*Œ.*) *ellenella*, Newm., (*Conch.*) *auriceps*, Butl., (*Œ.*) *declivis*, *molliculella*, and *latifissella*, Walk., (*Symmoca*) *herodiella*, Feld., (*Œ.*) *partitella*, Walk., (*Œ.*) *agnesella*, Newm., (*Œ.*) *productella*, Walk. (= *griseicostella*, Z.), (*Pseecadia*) *pretiosella*, Walk., (*Œ.*) *adaptatella*, Walk. (= *propriella*, *id.*), (*Œ.*) *interlineatella*, *bracteatella*, *acutella*, *aurinatella*, *xanthiella*, and *tentatella*, Walk., (*Œ.*) *trijugella*, Z., and *Tort. bimaculana*, Don. P. Linn. Soc. N. S. W. viii. pp. 473–509.

Leistomorpha, Meyr., full characters of, p. 509; *Compsotropha*, *id.*, p. 511, and *Eriodyta*, p. 514; *Œ. contentella* and *subpunctella*, and *Gelechia abluctella*, Walk., referred to the latter genus and redescribed: Meyr., *t. c.*

Glyphipteryx haworthana, Stph., and larva noticed; Sorh., B. E. Z. xxix. p. 95.

Argyresthia gædartella: larva described; Ent. M. M. xxi. pp. 203–206.

Heliozela resplendella, St.: habits of larva; Sorh., B. E. Z. xxix. p. 101.

Zelleria insignipennella, St.: larva noticed; *id. t. c.* p. 89.

Coleophora frischella, L., *viminetella*, Z., *leucapennella*, H., *genistæ*, St.: habits of larvæ noticed; *id. t. c.* pp. 95 & 96. Note on the metallic green species of *Coleophora*; Staint., Ent. M. M. xxii. p. 97. *C. flavaginella*, Lien.: application of name discussed; *id. t. c.* p. 135.

Goniodoma millierella, habits of; Const., Ent. M. M. xxi. p. 235.

Chauliodus insecurellus, food-plant of; P. E. Soc. 1885, p. iii. *C. æquidentellus*, Hfm.: habits of larva; Sorh., B. E. Z. xxix. p. 98.

Cosmopteryx eximia, Hw., *lienigiella*, Z. (woodcut): larvæ noticed and described; *id. t. c.* pp. 98–101.

Heydenia fulviguttella, Z.: larva noticed; *id. t. c.* p. 97.

Chrysoclista aurifrontella, H., with woodcuts, *linella*, Cl., habits of larvæ; *id. t. c.* p. 96.

Antispila pfeifferella, H.: habits of larva; *id. t. c.* p. 101.

Elachista, *cf.* Frey (116).

Lithocolletis geniculella, Ragt., *padella*, Gl., *faginella*, Z., *sorbi*, Frey, *corylifoliella*, Hw.: habits of larvæ; *id. t. c.* pp. 102–104. *L. scitulella*, Zell., = (*caudiferella*, Rag.); Snell., Tijdschr. Ent. xxviii. p. 203.

Tischeria heinemanni, Wk., *dodonæa*, Hd.: habits of larvæ; Sorh., B. E. Z. xxix. p. 104.

Phyllocnistis suffusella, Z., *saligna*, Z.: habits of larvæ; *id. t. c.* pp. 105 & 106.

Cemiostoma laburnella, St.: habits of larva; *id. t. c.* p. 106.

Bucculatrix frangulella, Goeze: food-plant; *id. t. c.* p. 107. *B. maritima*: note on larva and cocoon; Rag., Bull. Soc. Ent. Fr. (6) v. p. cli.

New genera and species:—

Sesiomorpha (to be placed at beginning of the fam. before *Atychia*), for *S. abnormis*, Celebes, sp. n.; Snell., JB. nass. Ver. xxxviii. pp. 111 & 112.

Adelomorpha, near *Lecithocera*, p. 31, for *A. ritsemæ*, Celebes, sp. n., p. 32, pl. iii. figs. 1–3; *id.* Tijdschr. Ent. xxviii.

Agriophara (*Cryptolechiidæ*), for *A. cinerosa*, p. 439, *diminuta*, p. 440, S. Australia, spp. nn.; Rosk., Ann. N. H. (5) xvi.

Choregia striana, p. 17, *basalis*, p. 18, Celebes, Snell., Tijdschr. Ent. xxviii.

Hapsifera rugosella, Macassar, *id. t. c.* p. 20, pl. ii. figs. 1–4.

Tinea swinhoei, Aden, Butl., P. Z. S. 1884, p. 502; *T. turatiella*, Genoa, Mill., Bull. Soc. Ent. Fr. (6) v. p. cxi.; *T. mauritanica*, Algeria, Baker, Ent. M. M. xxi. p. 269; *T.* (?) *fraudulens*, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 437, pl. xi. fig. 12.

Blabophanes trimaculella, Celebes, Snell., Tijdschr. Ent. xxviii. p. 21, pl. ii. figs. 5–7.

Adela chrysolamprella, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 438.

Nematois xanthobasella, Celebes, Snell., Tijdschr. Ent. xxviii. p. 23.

Depressaria cervariella (and larva), France, Constant, Ann. Soc. Ent. Fr. (6) iv. p. 271, pl. x. fig. 13.

Symmocha stæchadella (and larva), Alpes mar., *id. t. c.* pp. 260 & 261, pl. x. fig. 23.

Gelechia tetragonella, England, Staint., Ent. M. M. xxii. p. 99; *G. clerica*, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 438.

Parasia albiramosella, Achal-Tekke, Chr., Rom. Mém. ii. p. 159, pl. vii. figs. 9*a* & *b*.

Cleodora inrisella, Corsica, Constant, Ann. Soc. Ent. Fr. (6) iv. p. 257, pl. x. fig. 18.

Nannodia eppelsheimi, Germany, Stgr., S. E. Z. xlvi. p. 351.

Ptocheusa coleella (and larva), Alpes mar., Constant, Ann. Soc. Ent. Fr. (6) iv. p. 255, pl. x. fig. 16.

Tachyptilia hirsutella (and larva), Alpes mar., *id. t. c.* p. 256, pl. x. fig. 17.

Tortricomorpha bilinella, p. 27, pl. ii. figs. 16 & 17, *niveicilliella*, fig. 18 p. 28, Celebes, Snell., Tijdschr. Ent. xxviii.

Ypsolophus bisignellus, Celebes, *id. t. c.* p. 30, pl. iii. figs. 12 & 13; *Y. argentinellus*, Argentine Rep., Berg, An. Soc. Arg. xix. p. 282.

Sophronia cosmella, Corsica, Constant, Ann. Soc. Ent. Fr. (6) iv. p. 258, pl. x. fig. 19.

Metanarsia junctivittella, Achal-Tekke, Chr., Rom. Mém. ii. p. 161, pl. viii. fig. 11.

Pleurota ochreostrigella, *algeriella*, Algeria, Baker, Ent. M. M. xxi. p. 269; *P. breviella*, pl. x. fig. 20, *bistriella*, p. 259, fig. 21, *semicanella*, p. 260, fig. 22, Corsica, Constant, Ann. Soc. Ent. Fr. (6) iv.

Lita gallicella (and larva), Alpes mar., Constant, *t. c.* pp. 253 & 254, pl. x. fig. 14.

Butalis serella, p. 11, pl. i. fig. 31, France, *focella*, p. 12, pl. i. figs. 32 & 32*a*, *mediella*, p. 13, pl. i. fig. 33, Corsica, *id. op. cit.* v.; *B. vitilella*, Achal Tekke, Chr., Rom. Mém. ii. p. 163, pl. viii. fig. 12.

Blastobasis concretella, Macassar, Snell., Tijdschr. Ent. xxviii. p. 34, pl. iii. figs. 4–6.

Setomorpha corticinella, Celebes, *id. t. c.* p. 24, pl. ii. figs. 12–15.

Cryptolechia uruguayensis (and larva), Uruguay, Berg, An. Soc. Arg. xix. p. 280.

Œcophora fuscifrontella, Corsica, Const., Ann. Soc. Ent. Fr. (6) iv. p. 262, pl. x. fig. 24; *Œ. ragonotella*, Corsica, *id. op. cit.* v. p. 5, pl. i. fig. 25.

Eulechria leucopsina, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 441, pl. xi. fig. 5.

Philobota biophora, p. 474, *ancylotoxa*, p. 475, *chrysopotama*, *catascia*, p. 476, *monolitha*, p. 477, *catalampra*, p. 478, *hypocausta*, p. 481, *crypsichola*, *xiphostola*, p. 482, Australia; *nephelarcha*, p. 483, Tasmania; *phauloscopa*, *crepera*, p. 484, *acropola*, p. 485, *orinoma*, p. 486, Australia; *atmobola*, p. 486, Tasmania; *crebodes*, p. 487, *pedetis*, p. 488, Australia; *leucomitra*, p. 488, Austr., Tasm.; *hapala*, p. 489, *glaucoptera*, p. 490, *cretacea*, p. 491, *calamæa*, p. 492, *monogramma*, p. 493, *chionoptera*, *hydara*, p. 494, *pruinosa*, p. 495, Australia; *squalidella*, Austr., Tasm., p. 496; *tyroxantha*, p. 497, *melirrhoa*, *crocobapta*, p. 498, *anachorda*, p. 499, *brochosema*, p. 500, *monophaes*, p. 504, Australia; *euxantha*, Austr., Tasm., p. 505; *occidua*, p. 507, *homotona*, *melanoploca*, p. 508, *pulverea*, *electrodes*, p. 509, Australia: Meyr., P. Linn. Soc. N. S. W. viii. *P. athletica*, S. Australia, Rosk., Ann. N. H. (5) xvi. p. 443, pl. xi. fig. 13.

Leistomorpha brontoscopa, p. 510, Australia and Tasmania, *L.* (?) *ochrocausta*, p. 511, Australia, Meyr., *t. c.*

Compsotropha selenias, p. 512, *strophiella*, *charidotis*, p. 513, Australia, *id. t. c.*

Eriodyta sigmophora, p. 516, *leptostola*, p. 517, *hololeuca*, p. 518, *vernalis*, p. 519, Australia, *id. t. c.*

Brachynemata cingulata, Australia, Meyr., P. Linn. Soc. N. S. W. ix. p. 1045.

Microbela epicona, p. 1046, *allocoma*, p. 1047, *monodyas*, p. 1048, Australia, *id. t. c.*

Heterozyga coppatias, Australia, *id. t. c.* p. 1049.

Oxythecta nephelonota, p. 1051, Tasmania, *hieroglyphica*, p. 1052, *zonoteles*, p. 1053, *lygrosema*, p. 1054, Australia, *id. t. c.*

Crepidosceles iostephana, p. 1056, *exanthema*, p. 1057, Australia, *id. t. c.*

Ocystola hemicalypta, *thymodes*, p. 1061, *gnomica*, *thyasotis*, p. 1062, *hemisema*, p. 1063, *oxytora*, *malacella*, p. 1064, Australia, *isarithma*, p. 1065, Tasmania, *acroxantha*, Austr. and Tasm., *anthera*, Australia, p. 1066, *callista*, p. 1067, *tyranna*, p. 1068, *enoplia*, p. 1069, Australia, *coniata*, p. 1069, *agelæa*, p. 1070, Tasmania, *psamathina*, p. 1070, *miliehia*, *protosticha*, p. 1071, *euanthes*, *placoxantha*, p. 1072, *mesoxantha*, *pyramis*,

p. 1073, *acrobaphes*, *illuta*, p. 1074, Australia, *lithophanes*, Tasmania, *monostropha*, p. 1075, *homoleuca*, *chionea*, p. 1076, *glacialis*, *crystallina*, p. 1077, *diclethra*, p. 1079, *niphodesma*, p. 1080, *trilicella*, *thalamepola*, p. 1081, *neurota*, p. 1082, Australia, *id. t. c.*

Glyphypteryx argyroguttella and *gianelliella*, Turin, Ragt., Bull. Soc. Ent. Fr. (6) v. p. lvi.

Heliozela hammoniella (sp. n. ?), Hamburg, Sorh., Ent. Nachr. xi. p. 338.

Coleophora amethystinella, France, Rag., Le Nat. vii. p. 167; *C. squamella*, p. 6, pl. i. fig. 26, *macrobiella*, p. 7, pl. i. fig. 27, *albicella*, p. 8, pl. i. fig. 28, *camphorosmella*, p. 9, pl. i. fig 29, France (with descriptions of the cases borne by the larvæ), Const., Ann. Soc. Ent. Fr. (6) v.; *C. paludicola*, England, Staint., Ent. M. M. xxii. p. 9; *C. tinctoriella*, England, Coverd., Ent. xviii. p. 225.

Elachista longipennis, p. 102, *exiguella*, p. 105, *spectrella*, p. 107, Switzerland, Frey., S. E. Z. xlvi.

Batrachedra dimidiella, Celebes, Snell., Tijdschr. Ent. xxviii. p. 35, pl. iii. figs. 7 & 8.

Stagmatophora divitella (and larva), France, Const., Ann. Soc. Ent. Fr. (6) v. pp. 10 & 11, pl. i. fig. 30.

Lithocolletis anderidæ, S. England, Fletch., Ent. M. M. xxii. p. 40; *L. chrysella*, France, Const., Ann. Soc. Ent. Fr. (6) v. p. 13, pl. i. fig. 34.

Nepticula dewitziella, Hamburg, Sorh., Ent. Nachr. xi. p. 284.

Pterophoridæ and Alucitidæ.

Catalogue of the known larvæ of European *Pterophoridæ* and *Alucitidæ*; Roüast, Ann. Soc. L. Lyon (n.s.) xxx. pp. 149–152.

Pterophoridæ. Habits of some British; Ent. M. M. xxi. p. 207.

South gives another instalment of his contributions to the history of the British *Pterophori*; Ent. xviii. pp. 273–282, pl. i.

Mimæseoptilus mictodactylus, Bouché: larva noticed; Sorh., B. E. Z. xxix. p. 108. *M. orites*, *charadrias*, p. 126, *lithoxestus*, p. 127, New Zealand, Meyr., Tr. N. Z. Inst. xvii.; *M. pulcher*, Achal-Tekke, Chr., Rom. Mém. ii. p. 164, pl. viii. fig. 13: spp. nn.

Cenoloba, g. n., near *Aciptilia*, for *Pterophorus obliteralis*, Walk. (Australia); Walsingham, Ent. M. M. xxi. p. 176, figs. 2 & 2*a*.

Aciptilia monospilalis, Walk. (= *A. patruelis*, Feld.), and *Pterophorus innotatalis*, Walk., is an *Aciptilia*; *A. lycosema*, New Zealand, sp. n.: Meyr., Tr. N. Z. Inst. xvii. p. 124. *A. punctinervis* (and larva, p. 15), France, sp. n., Const., Ann. Soc. Ent. Fr. (6) v. p. 14, pl. i. fig. 35. Note on alar venation of some species; Meyr., Tr. E. Soc. 1885, p. 425.

Agdistis adactyla, H. Habits of larva; Sorh., B. E. Z. xxix. p. 107.

Platyptilia ochrodactyla, H., *bertrami*, Roess. (larva), *gonodactyla*, Schiff., noticed; *id. t. c.* p. 108. *P. emissalis*, Walk., p. 423, *Aciptilia aptalis*, Walk., p. 424, and *Doxosteres canalis* (*Pterophorus*) Walk., p. 425, redescribed; Meyr., Tr. E. Soc. 1885. *P. falcatalis*, Walk. (= *P. repletalis*, *id.*); *id.* Tr. N. Z. Inst. xvii. p. 128. *P. heliastis*, New Zealand, *id. t. c.* p. 129; *P. sematodactyla*, Argentine Rep., Berg, An. Soc. Arg. xix. p. 283: spp. nn.

Heptaloba, g. n., near *Amblyptilia*, for *Platyptilus argyrodactylus*, Walk. (Ceylon); Walsingham, Ent. M. M. xxi. p. 175, figs. 1 & 1*a*.

Oxyptilus parvidactylus, Hw. Season of; Sorh., B. E. Z. xxix. p. 108.

Pterophorus cosmodactylus: larva described; Porr., Ent. M. M. xxii. p. 149. *P. bertrami*: larva of, described; *id. t. c.* p. 103.

Œdematophorus pelodactylus (and larva), Argentine Rep., sp. n., Berg, An. Soc. Arg. xix. p. 284.

Lioptilus celidotus, New Zealand, Meyr., *t. c.* p. 125, sp. n. *L. brachydactylus*, Tr., noticed; Sorh., B. E. Z. xxix. p. 108.

(D.) *DIPTERA.*

[*Cf.* Adolph (3), Balbiani (14), Bigot (29), Brauer (42, classification, mimicry, &c.), Ciaccio (75), Hickson (138), Lee (185), Plateau (250), Portschinsky (254), Röder (288), Viallanes (346, 347), Williston (364, 367), Wulp (372, 375).]

Organs of flight, Amans (5).

Teeth of flies. The series of short papers by W. D. Harris is continued in Sci. Goss. xxi. The teeth of the following are figured : *Anthomyia meteorica*, p. 4, fig. 1, *Scatophaga stercoraria*, p. 59, fig. 48, *Sarcophaga carnaria*, p. 132, fig. 90, *Stomoxys calcitrans*, p. 153, fig. 100, *Caricea tigrina*, p. 206, fig 145, *Fucella fucorum*, p. 266, fig. 180.

On mimicry in *Diptera* ; Sci. Goss. xxi. p. 241.

Highly magnified figures of antennæ of numerous *Diptera* are given in J. Micr. & Nat. Sci. iv. pls. v.–vii.

Diagrammatic sketches of mouths of Drone-fly and Blow-fly (*Syrphidæ* and *Muscidæ*) ; *t. c.* p. 263, pl. xxiii.

Wulp (375), p. 70, in a note, informs us that original coloured drawings of Doleschall, representing most of the species described by him, are in the hands of M. J. Puls, of Belgium, and accurate copies thereof belong to the Dutch Entomological Society, Leyden, and to Baron Osten Sacken.

Kowarz, F. Beiträge zu einem Verzeichniss der Dipteren Böhmens. Wien. ent. Z. iv. pp. 105, 133, 167, 201, & 241.

These pages comprise many notes of value and tables of the characters of species, from *Syrphidæ* to *Penium*. The following are the more important, viz. : *Melithreptus*, varieties and species tabulated, p. 133 ; table of species of *Syrphus*, pp. 134, &c. ; some synonymical observations on *Syrphi*, pp. 167 & 168 ; tables of species of *Melanostoma*, p. 201, of *Platychirus*, p. 202, of *Chilosia*, pp. 204 & 206, of *Chrysogaster*, p. 208 ; pp. 241–244 deal with *Pipiza* and allied genera.

Cecidomyiidæ.

[*Cf.* Löw (197), Riley (283), Schlechtendal (304), Thomas (340).]

A year's work among the gall-gnats ; Inchbald, Ent. xviii. p. 311.

Note on the papilla-like organs of *Cecidomyia* larva ; Verh. z.-b. Wien, xxxv. p. 331.

Löw, Verh. z.-b. Wien, xxxv. pp. 489–498, gives information about *C. persicariæ*, L., *serotina*, Winn., *euphorbiæ*, Lw., *salicis*, Schr., *galii*, Lw., *asperulæ*, Lw., *hieracii*, Lw., *marginem-torquens*, Winn., *terminalis*, Lw., *rosarum*, Har., *tasi*, Inch., *beckiana*, Mik, *Diplosis helianthemi*, Har.,

anthophthora, Lw., *Lasioptera carophila*, Lw., *Asphondylia ononidis*, Lw., *verbasci*, Vall.; *Hormomyia poæ*, Bosc., = (*graminicola*, Winn., = *C. graminis*, Brisch.).

HAGEN, H. A. Further Material concerning the Hessian-fly; and on the Hessian-fly in Italy. Canad. Ent. xvii. pp. 81–93 & 129–131.

Deals chiefly with information as to the early history of the fly in the United States N. America, gathered from old records. The second note relates chiefly to an observation of Costa.

The galls of *Cecidomyia taxi* and of *C. euphorbiæ* figured and noticed by Mik, Wien. ent. Z. iv. pp. 65 & 66, pl. i. *C. leguminicola*, ravages of; Riley, Rep. Ent. 1884, p. 411. Galls of *C. poæ* and biology of the insect; Boyerinck (28). *C. tritici*, ravages of; Orm., Rep. viii. p. 31. *C.* sp. larva infesting pear; Riley, Rep. Ent. 1884, pp. 396–398, pl. ix. fig. 6.

Diplosis tritici, Kirby, note on; Riley, Rep. Ent. 1884, p. 389.

Note on *Asphondylia* (= *Lasioptera*), *hieronymi*, Wey.; Löw, Verh. z.-b. Wien, xxxv. p. 511.

Cecidomyia beckiana, Europe, on *Inula conyza*, Mik, Verh. z.-b. Wien, xxxv. p. 137, pl. x.; *C. potentillæ*, p. 193, *trachelii*, p. 195, Central Europe (imago, larva, and gall, pl. ii.), Wachtl., Wien. ent. Z. iv.; *C. ericina*, S.E. Europe, p. 484, *phyteumatis*, p. 487, *hypogæa*, p. 489, Alps, Löw, Verh. z.-b. Wien, xxxv.; *C. oleæ*, p. 109, Croatia, *alpina*, p. 110, Austrian Alps and Scotland, with larvæ and their galls, *id.* B. E. Z. xxix.: spp. nn.

Diplosis mediterranea, Med. basin, p. 485, sp. n., *id.* Verh. z.-b. Wien, xxxv.

MYCETOPHILIDÆ.

[*Cf.* GRZEGORZEK (130, 131).]

Metamorphoses of *Zygoneura sciarina*; Beling, Wien. ent. Z. iv. p. 308.

Apolephthisa, g. n., between *Empalia* and *Tetragoneura*, p. 205, for *A. rara*, sp. n., Austria, p. 206, pl. ix A, fig. *e*; Grzeg., B. E. Z. xxix.

Parastemma, g. n., between *Aenemia* and *Azana*, p. 199, pl. ix. A, figs. *a–c*, for *P. ambigua*, sp. n., *ibid.* (no locality) ? Austria; *id. t. c.*

Platyura simplex, p. 201, *lucosa*, p. 202, *decora*, p. 203 (no locality, probably Austria), *id. t. c.*, spp. nn.

Polylepta flava (no locality, probably Austria), *id. t. c.* p. 204, sp. n.

Boletina nitida (no locality, probably Austria), *id. ibid.*, sp. n.

Sciara conica, *sznablii*, p. 52, *interdicta*, *interstincta*, *mikii*, *cinerascens*, *kowarzii*, *dziedzickii*, p. 55, *læta*, p. 56, *nowickii*, p. 59, *vulpina*, p. 69, *colorata*, *satiata*, p. 71, *ardua*, *confusa*, *angusta*, *suavis*, *aspirans*, p. 72, *difficilis*, *electa*, *rufa*, p. 74, *fugax*, p. 75, Galicia, tabulated with other species, *id. t. c.* *S. dispar*, Germany, sp. n., Beling, Wien. ent. Z. iv. p. 307.

SIMULIIDÆ.

Simulium sp. figured: ravages, remedies, metamorphoses; Riley, Rep. Ent. pp. 340–345, pl. ix. figs. 1–3. *S. indicum*, Assam, described and figured; Becher, J. A. S. B. liii. p. 199, pl. xiv.

Culicidæ.

Development of *Culex pipiens* ; J. Micr. & Nat. Sci. iv. p. 38, pl. iv.

Anopheles barbirostris noticed, p. 79, *annularis*, p. 80 ; heads of figured, pl. iv. figs. 1 & 2 : Wulp, Tijdschr. Ent. xxviii.

Corethra culiciformis, De Geer, noticed ; Röder, Ent. Nachr. xi. p. 217.

Megarrhina portoricensis, Porto Rico, sp. n., *id.* S. E. Z. xlvi. p. 337.

Chironomidæ.

Chironomus egg, Balbiani (14) ; *C. prasinus*, Hammond (135). Note on the parthenogenesis of *C. grimmii* ; Schneider, Zool. Beitr. i. p. 301.

Tipulidæ.

Van der Wulp comments on East Indian *Ctenophoræ* and the genus *Prionota*, and redescribes, notices, or figures, Tijdschr. Ent. xxviii. pl. iv., the following species of *Tipulidæ* :—*Prionota nigriceps*, p. 82, fig. 3 ; *Megistocera fuscana*, p. 83, fig. 5, wing ; *Tipula leucopyga*, p. 84, fig. 6, wing ; *tenuis*, p. 85, fig. 7, wing ; *Pœcilostola pallens*, p. 86, fig. 8, wing.

Note on *Mochlonyx*, Lw. ; Röder, Ent. Nachr. xi. p. 217.

Eriocera albipunctata, ♂, *hilpa*, Walk. (of which *leucostola*, Walk., may be a variety), described ; Wulp, Notes Leyd. Mus. vii.

Megistocera fuscana, additional characters of ; *id. t. c.* p. 3.

Tipula oleracea, severe ravages of in 1884 ; Orm., Rep. viii. p. 19.

New genus and species :—

Prionota, p. 1, near *Ctenophora*, for *P. nigriceps*, sp. n., Java, p. 2 ; Wulp, Notes Leyd. Mus. vii.

Eriocera trifasciata, Porto Rico, Röder, S. E. Z. xlvi. p. 338 ; *E. ferruginosa*, Java, p. 13, Wulp, *t. c.*

Tipula serrata, Serahan, *pilosula*, p. 5, *leucopyga*, p. 6, Java, *tenuis*, p. 7, Surinam, *id. t. c.*

Pachyrhina maderensis, Madera, *nigro-annulata*, Morotai, p. 8, *quadrivittata*, p. 9, *triplasia*, p. 10, Java, *id. t. c.*

Pœcilostola pallens, Java, *id. t. c.* p. 13.

Ctenophora annulosa, Java, *id. t. c.* p. 1.

Rhyphidæ.

Rhyphus maculipennis, p. 15, Java, sp. n., Wulp, Notes Leyd. Mus. vii. ; noticed and wing figured, Tijdschr. Ent. xxxviii. p. 87, pl. iv. fig. 9.

Xylophagidæ.

[*Cf.* Williston (365).]

Agapophytus, Guer., belongs to the *Therevidæ*, and *Cyclotelus*, Walk., is not the same ; *C. socius*, Walk., being probably not *A. australasiæ*,

Guer.: Röder, B. E. Z. xxix. pp. 137–139. *A. albopunctatus*, Australia, sp. n., *id. t. c.* p. 139, pl. iv.A, figs. 1–3.

Phycus, Walk., note on; *id. t. c.* p. 140. *P. tristis*, Sarepta, sp. n., *id. ibid.*

Subula pallipes, Löw, noticed; Willis., Canad. Ent. xvii. p. 122. *S. parens*, N. America, sp. n., *id. ibid.*

Xylophagus decorus, gracilis, N. America, spp. nn., *id. t. c.* p. 121.

Cœnomyiidæ.

Cœnomyia cinereibarbis, Big., noticed; *id. t. c.* p. 121.

Stratiomyiidæ.

Williston (365) notices or describes the following: *Beris mexicana*, Bell.?, *Sargus viridis*, Say (= *nigribarbis*, Big.), *Hermetia lativentris*, Bell., *Euparhyphus bellus*, *Clitellaria lata*, *Odontomyia flava*, Day, &c.; Canad. Ent. xvii. pp. 121–128.

Tinda and *Biastes*, Walk., are the same, the former to be used, and *Tinda* (sub *Biastes*) *indica* (= *T. nodifera* = *Phyllophora bispinosa*, Thoms.); Wulp, Notes Leyd. Mus. vii. p. 57.

Ecasa. *Nerua*, Walk., is to be suppressed, as a synonym of this; *id. ibid.*

Sargus metallinus (= *formicæformis*, Dol.), and *S. mactrans*, Walk., redescribed; *id. t. c.* p. 65.

Ptecticus. *Sargus tenebrifer* and *S. latifascia*, Walk., are no doubt *Ptectici*; *S. brevipennis*, Rond., also a *Ptecticus*, and redescribed; *id. t. c.* p. 6.

Hermetia batjanensis, Wulp, *H. melanesiæ*, Big., and *Massicyta cerioides*, Walk., are perhaps all one species, the last having priority; *id. t. c.* p. 67.

Odontomyia viridana, Wied. (= *ruficornis*, Macq.); *id. t. c.* p. 61.

New genera and species:—

Scoliopelta (*Beridinæ*), for *S. luteipes*, sp. n., N. America; Willis., Ent. Am. i. p. 154.

Cænacantha, p. 58, for *C. bipartita*, sp. n., Bogota, p. 59, pl. v. figs. 1, 1*a*, & 1*b*; Wulp, Notes Leyd. Mus. vii.

Sargus lætus, Sumatra, p. 66, *pubescens*, Gorontalo, p. 67, *id. t. c.*

Macrosargus clavis, N. America, Willis., Canad. Ent. xvii. p. 123.

Ptecticus sackenii (= *P. testaceus*, Ost.-Sack.), Florida, *similis*, N. America, Willis., Canad. Ent. xvii. p. 124; *P. apicalis*, Borneo, Wulp, Notes Leyd. Mus. vii. p. 62.

Hermetia armata, Morotai, *id. t. c.* p. 69; *H. comstocki*, Arizona, Willis., Canad. Ent. xvii. p. 125.

Euparhyphus ornatus and sp. n.?, N. America, *id. t. c.* p. 126.

Odontomyia mutica, Ternate, Wulp, *t. c.* p. 62.

Stratiomyia japonica, Japan, *flavoscutellata*, Java, *id. t. c.* p. 60.

Clitellaria argentata, Arizona, Willis., *t. c.* p. 127.

TABANIDÆ.

Presumed g. n. from N. America noticed by Willis., Ent. Am. i. p. 12.

Diachlorus diversipes, ♂, Wulp, Notes Leyd. Mus. vii. p. 81.

Chrysops striatus, p. 79, China, *dimidiatus*, S.W. Africa, p. 80, spp. nn., *id. t. c.*

Tabanus multipunctatus, p. 72, pl. v. fig. 2, *leucaspis*, fig. 3, p. 74, *atripes*, fig. 4, *bipunctatus*, fig. 5, p. 75, W. Africa, *equestris*, p. 77, fig. 6, Sanda Islands, *felderi*, p. 78, fig. 7, China, spp. nn., *id. t. c.*

LEPTIDÆ.

Lampromyia. In a new species of this genus, and probably, therefore, in others, there are certainly three "pelotes" on all the tarsi, and the position of the genus is therefore in *Leptides*; Bigot, Bull. Soc. Ent. Fr. (6) v. p. lxvii. *L. argentata*, sp. n., S. Africa, *id. t. c.* p. lxviii.

Note on an insect allied to *Triptotricha fasciventris*, Loew, with reference to the dubious position of *Hilarimorpha*; Willis., Ueber einige Leptiden-Charaktere, S. E. Z. xlvi. p. 400.

Apatolestes, g. n., for *A. comastes*, California, sp. n., *id.* Ent. Am. i. p. 12.

ASILIDÆ.

[*Cf.* Williston (368).]

Apioceridæ are not *Asilidæ*, but should form a special family; Brauer (42).

Apiocera. Coquillet discusses this genus, and refers it to the *Therevidæ*; Psyche, iv. p. 243.

Leptogaster cubensis (*Gonypes*), Big., redescribed; Röder, S. E. Z. xlvi. p. 340.

Dasypogon japonicum, Big. Corrected diagnosis of; *id.* MT. schw. ent. Ges. vii. p. 192.

Cyrtopogon oculiferum not the same as *C. meyerdurii*; Bigot, Bull. Soc. Ent. Fr. (6) v. p. xii. *C. meyerdurii* (= *C. oculiferum*, Big.), while *C. montanum*, Big., *nec* Lw., is named *culminum*, n. n.; *id.* Wien. ent. Z. iv. p. 90. *C. longibarbus*, Loew (= *Eupalmus alpestris*, Jänn.), and *Eupalmus* at best only subgen.; Mik, Verh. z.-b. Wien, xxxv. p. 328.

Holopogon nigripennis, note on habit of; *id. ibid.*

Dasyllis (*Laphria*) *nigripennis*, Wied. The habitat is Zanzibar; Röd., B. E. Z. xxix. p. 137.

New species:—

Aphamartania fur, Arizona, Willis., Tr. Am. Ent. Soc. xii. p. 53.

Microstylum hildebrandtii, Madagascar, Karsch, Ent. Nachr. xi. p. 345.

Laphria rufa, Japan, Röd., MT. schw. ent. Ges. vii. p. 192; *L. ventralis*, California, *ruficauda*, San Domingo, Willis., Tr. Am. Ent. Soc. xii. p. 55.

Andrenosoma chalybea, San Domingo, *id. t. c.* p. 56.

Mallophora nigra, p. 58, *guildiana*, p. 60, N. America, *id. t. c.*

Promachus princeps, *id. t. c.* p. 62, and (as sp. n.) *op. cit.* xi. pl. ii. fig. 15; *P. albifacies*, *id. op. cit.* xii. p. 62, N. America.

Erax tagax, p. 65, *jubatus*, p. 66, *latruncalus*, *furax*, p. 67, *stramineus*, *similis*, p. 68, *leucocomus*, p. 69, *varipes*, p. 71, *id. t. c.*

Proctacanthus rufus, N. America, *id. t. c.* p. 74.

Emphysomera pulchra, Brazil, Engel, Ent. Nachr. xi. p. 146.

Nemestrinidæ.

Hirmoneura obscura, Meig. Note on its appearance: Brauer, Verh. z.-b. Wien, xxxiv. p. 271.

Bombyliidæ.

Exoprosopa. To this genus belongs *Anthrax nox*, Walk.; Röd., B. E. Z. xxix. p. 137. *E. doryca* (= *audouini*, Macq.); Wulp, Notes Leyd. Mus. vii. p. 81.

Anthrax troglodyta, Fab. (= *hyalina*, Wied., = *lucens*, Walk.); *id. t. c.* p. 83.

Life-history of *Argyramœba sinuata*: v. Stein, Ent. Nachr. xi. p. 306; Mik, *t. c.* p. 343. *A. distigma* var. = (*Anthrax tripunctata*, Wulp); Wulp, *t. c.* p. 83.

Comastes. *Bombylius pulchellus*, Wulp, belongs to this; *id. t. c.* p. 85.

New species:—

Exoprosopa cingulata, Adelaide, *id. t. c.* p. 82.

Neuria indecora, Poeloe Gamoe, *id. t. c.* p. 85.

Epibates quedenfeldti, Algeria, Engel, Ent. Nachr. xi. p. 178, woodcut.

Argyramœba melania, Java, Wulp, *t. c.* p. 84, pl. v. fig. 8.

Anastœchus longirostris, Himalayah, *id. t. c.* p. 85.

Systœchus leucopygus, Adelaide, *id. t. c.* p. 86.

Therevidæ.

Agapophytus, *Cyclotelus*, and *Phycus*, *cf. Xylophagidæ*, p. 221.

Empidæ.

Hilarimorpha singularis noticed; Willis., S. E. Z. xlvi. p. 401.

Dolichopodidæ.

Syntormon (*Rhaphium*) *sulcipes*, Meig. (= *S. œdicnemus*, Lw.); Ent. Nachr. xi. p. 9.

Psilopus pilosus, Lw., characters of ♀ of; Röder, S. E. Z. xlvi. p. 340.

Pelastoneurus fasciatus, sp. n., Porto Rico, *id. t. c.* p. 341.

Syrphidæ.

Williston (364). Synoptic tables of the subfamilies and genera of N. American *Syrphidæ*.

Eristalis tenax as carrier of contagion : Maddox (203).

Merodon equestris, Ritzema (285).

Larvæ and pupæ of *Microdon mutabilis*, L., in nest of *Lasius niger*, in Scotland ; Cam., P. N. H. Soc. Glasg. i. (n.s.) p. 42.

Pelecocera, Meig., = (*Euceratomyia*, Willis.), *Merapioidus* being distinct ; Willis., Bull. Brooklyn Soc. vii. p. 138.

Syrphus venustus, Mg. (= *hilaris*, Zett.) ; also remarks on synonymy of other *Syrphi* ; Kowarz, Wien. ent. Z. iv. pp. 167 & 168.

Doros destillatorius, Mik (*cf. infrà*), male described ; also var. *bipunctatus* of *D. conopseus*, F. ; Verh. z.-b. Wien, xxxv. p. 327.

Pteroptila cincta, Drury, redescribed ; Röder, S. E. Z. xlvi. p. 342.

New species :—

Chilosia lasiopa, Bohemia, Kowarz, Wien. ent. Z. iv. pp. 204 & 206.

Syrphus cuchromus, Bohemia, *id. t. c.* pp. 135 & 167.

Orthoneura varipes, Caucasus, Bigot, Ann. Soc. Ent. Fr. (6) v. p. 249.

Ischyrosyrphus tigerinus, "Indes," *id. ibid.*

Lasiophthicus annamites, Cochin China, *id. t. c.* p. 250.

Melanostoma cyanocincta, Mexico, *id. t. c.* p. 251.

Doros destillatorius, Europe, Mik, Wien. ent. Z. iv. p. 53.

Ocypiamus fenestratus, p. 251, Mexico, *fuscicolor*, New Caledonia, p. 252, *id. t. c.* ; *O. fasciatus*, Porto Rico, Röder, S. E. Z. xlvi. p. 342.

Xylota cuprina, "Indes," Bigot, *t. c.* p. 247.

Brachyopa rubriventris, Australia, *id. t. c.* p. 248.

Syritta vitripennis, Cape G. H., *id. ibid.*

Eristalomyia notata, Cape G. H., *id. t. c.* p. 249.

Conopidæ.

[*Cf.* Williston (366).]

Conops gracilis, Arizona, p. 377, *fronto*, Kansas, p. 378, spp. nn., Willis., Tr. Conn. Ac. vi.

Zodion pictulum, New Mexico, p. 379, *leucostoma*, Arizona, p. 380, *pygmæum*, California, p. 381, spp. nn., *id. t. c.*

Myopa pictipennis, p. 382, *pilosa*, p. 383, California, *plebeia*, p. 384, Arizona, spp. nn., *id. t. c.*

Œstridæ.

Œstrus bovis, *cf.* Ormerod (235). *Hypoderma*, Joseph (158). Larva of an *Œstrid* found in neck of *Cistudo carolina* ; Ent. Nachr. xi. p. 63.

Gyrostigma, g. n., near *Gastrophilus*, for *G. sumatrensis*, sp. n., obtained (larvæ only) from a *Rhinoceros sumatrensis* deceased in the Zoological Gardens at Hamburg ; Brauer, Verh. z.-b. Wien, xxxiv. p. 269, pl. x.

Tachinidæ.

Brachycoma adolescens, Rond., = (? *Tachina devia*, Fall., = *B. devia*, Rond., = *Meigenia bombivora*, V. d. Wulp) ; Mik, Verh. z.-b. Wien, xxxv. p. 330.

Tachina onchestus, Walk., figured ; Walsm., Tr. L. S. ii. figs. 10 & 10*a*. Note on *T. aletiæ* and other *Tachinæ*, as parasites on *Aletia xylina* : Riley, Fourth Rep. U. S. Ent. Comm. p. 109.

A possibly new form of Tachinid *Diptera* from Thuringia discussed and figured ; Girsch., Ent. Nachr. xi. p. 3, pl., fig. 4, &c. For note on this doubtful *Muscid*, *cf.* Mik, Verh. z.-b. Wien, xxxv. p. 331.

Macquartia, *cf.* Stein (332).

New genera and species :—

Dimorphomyia [*Phasianidæ*], but of extremely doubtful affinities, head of *Syrphidæ*, wings of *Muscidæ*, for *S.* [*sic*] *calliphorides*, sp. n., Mexico ; Bigot, Bull. Soc. Ent. Fr. (6) v. p. clxxiii.

Bolbochæta, *id. t. c.* p. xliv., for *B. haustellata*, Buenos Aires, sp. n., p. xlv.

Trichodischia, near *Chetylia*, *id. ibid.*, for *T. cærulea*, *ibid.*, and *soror*, p. xlvi., Buenos Aires, spp. nn.

Dasyuromyia, *id. t. c.* p. liv., for *D. penicillata*, Chili, sp. n., p. lv.

Glossidionophora, near *Ocyptera*, for *G. nigra*, Buenos Aires, and *bicolor*, Australia, spp. nn., *id. ibid.*

Mikia, near *Fabricia*, for *F. magnifica*, Mk. ; Kowarz, Wien. ent. Z. iv. p. 51.

Trichopoda flava, Porto Rico, Röder, S. E. Z. xlvi. p. 343.

Ocyptera atra, *minor*, Porto Rico, *id. t. c.* p. 344.

Exorista tessellata (? *Eurygaster obscurus*, Big.), Porto Rico, *id. t. c.* p. 345.

Frontina rufifrons, Porto Rico, *id. t. c.* p. 346.

Tachina nigrifrons, *ripæ*, p. 18, *omnivora*, *geometræ*, p. 19, *papilionis*, *T.* (*Phorocera*) *abnormis*, p. 20, *flavibarbata*, *T.* (*Plagia*) *setosa*, *T.* (*Degeeria*) *flavifrons*, p. 21, bred from *Lepidoptera*, at Dantzic ; Brischke, Schr. Ges. Danz. (2) vi.

Dexidæ.

[*Cf.* Bigot (33), Wulp (373).]

Wulp comments on *Cordyligaster petiolata*, Wied., p. 192, and figures ♂ ♀, pl. vi. figs. 1 & 2 ; *Trichodura anceps*, Fabr., p. 194, pl. vi. figs. 5 & 6 ; and *Urodexia penicillum*, Ost.-Sack., p. 195 : Tijdschr. Ent. xxviii.

Rhamphinina, g. n., near *Zelia* and *Rhamphina*, for *R. dubia*, sp. n., Mexico ; Bigot, Bull. Soc. Ent. Fr. (6) v. p. xi.

Rhynchiodexia, g. n., part of the old genus *Dexia*, *id. t. c.*, for *R. tenuipes*, New Caledonia, sp. n., *id.*

Siphoniomyia, g. n., *id. t. c.* p. xii., for *S. melus*, sp. n., Mexico, *id.*

Anastellorhina, g. n., near *Rhynchomyia*, *id. t. c.* p. xxv., for *A. bicolor*, Australia, sp. n., *id. t. c.* p. xxvi.

Homodexia, g. n., near *Dexiosoma*, *id.*, for *H. rufina*, California, and *obscuripennis*, Ceylon, spp. nn., *id. ibid.*

Atractodexia, g. n., near *Dolleschalla*, *id. t. c.* p. xxxii., for *A. argentifera*, New Caledonia, sp. n., *id.*

Oxydexia, g. n., *id. t. c.* p. xxxiii., for *O. acuminata*, Brazil, sp. n., *id.*

The gen. is a synonym of *Uromyia*, Rob.-Desv., but the species is valid; *id. l. c.* p. xci., and Wien. ent. Z. iv. p. 182.

Leptoda, g. n., for *Dexia gracilis* and *diadema*, Wied.; Wulp, Tijdschr. Ent. xxviii. p. 196.

Graphia, g. n., p. 196, for *G. strigosa*, Halmaheira, sp. n., p. 197, pl. vi. figs. 9–11; *id. l. c.*

Euantha, g. n., for *Dexia dives*, Wied. (= *Sericocera pictipennis*, Macq.); *id. l. c.* p. 198.

Rhaphis, g. n., p. 199, for *R. elongata*, Ceylon, sp. n., p. 200, pl. vi. figs. 12–14; *id. l. c.*

Silbomyia (g. n. ?, without type, reference, or locality); Big., Rev. d'Ent. iv. p. 262.

Sarcophagidæ.

[*Cf.* Bigot (33).]

Larva of an unknown Sarcophagid parasitic on Scorpions in Sumatra; Ent. Nachr. xi. p. 321.

Muscidæ.

[*Cf.* Bigot (31, *Glossina*, by error *Glossinia*); Kowalevsky (173).]

Musca vomitoria, *cf.* Davison (88), Rees (267).

Habits of *Meromyza saltatrix*, Meig., and *Elachiptera cornuta*, Fab.; Lindeman, Bull. Mosc. lx. pp. 251–255.

Is *Cyrtoneura* a parasite or scavenger? discussed; Riley, Fourth Rep. U. S. Ent. Comm. p. 108.

Glossina morsitans, note on (Ueber die Tsetse-fliege); Biol. Centralbl. v. p. 183. Discussion on; Tijdschr. Ent. xxviii. p. ciii.

Glossina ventricosa, Australia?, sp. n., accompanied by table of the known species of the genus; Bigot, Ann. Soc. Ent. Fr. (6) v. p. 123.

Phæomyia umbripennis, Thuringia, sp. n., Girsch., Ent. Nachr. xi. p. 1, pl., fig. 1, &c. [*cf.* Mik, *t. c.* p. 341].

Ceratitis, *cf. Trypetidæ*.

Anthomyiidæ.

[*Cf.* Bigot (30).]

The character and limits of the family, p. 266; *Leucomelina*, Macq., doubtfully valid; *Limnophora elegans*, Macq. ?, identical with *Leucomelina picea*, Macq., therefore *Limnophora* should also be suppressed? pp. 263 & 264; *Spilogaster*, Macq., doubtfully valid, p. 264; *Dialyta*, Meigen, additional characters for, p. 265; *Proboscidomyia* and *P. siphonina*, Bigot, more fully described, pp. 266 & 267; *Spathitheromya* (gen.) and *S. stellata* (sp.), Bigot, more fully defined, *ibid.*; *Dasyphyma* (gen.) and *D. armata* (sp.), Bigot, more fully defined; *Homalomyia femorata*, Loew, probably belongs to the genus, p. 268; *Homalomyia canicularis*, Linn., this European species reported from Buenos Aires, p. 284; *Anthomyia canalicularis* (*sic*), this European species reported from Australia, p. 296: Bigot, Ann. Soc. Ent. Fr. (6) iv.

Anthomyia brassicæ: history, habits, and metamorphoses; Riley, Rep. Ent. pp. 319–321, pl. viii. fig. 5. *A. betæ*: ravages and remedies: Orm., Rep. viii. p. 63. *A. ceparum*, *id. t. c.* p. 69.

New species:—

Cænosia? *caledonica*, New Caledonia, Bigot, Ann. Soc. Ent. Fr. (6) iv. p. 269.

Syllegoptera curvineuris, Austria, *id. t. c.* p. 270.

Limnophora dubia (? var. of *L. elegans*, Macq., Mexico), p. 264, *rufifrons*, France, p. 270, *limbata*, Mexico, Chili, *chlorogaster*, Buenos Aires, p. 271, *normata*, *rufipes*, Mexico, p. 272, *aurifera*, *zebrina*, Chili, p. 273, *anthrax*, Mexico, p. 274, *id. t. c.*

Hydrophoria dubia, Gallia, p. 274, *pictipes*, *calopus*, Mexico, p. 275, *nigricauda*, Am. sept., *cincta*, Ternate, p. 277, *id. t. c.*

Chortophila tridens, *sexdentata*, p. 277, *appendiculata*, p. 278, Gallia, *spinipes*, Am. sept., *rubrifrons*, Buenos Aires, p. 279, *id. t. c.*

Parachortophila modesta, Morocco, *ruficoxa*, Chili, p. 280, *id. t. c.*

Hoplogaster notatus, Australia, *id. t. c.* p. 281.

Tricophticus tristis, Gallia, *crenatus*, Mexico, *id. t. c.* p. 282.

Lasiops nitens, Gallia, *id. t. c.* p. 283.

Homalomyia hispanica, Spain, p. 283, *mexicana*, Mexico, *dentata*, p. 284, *rupecula*, p. 285, Am. sept., *id t. c.*

Spilogaster trispilus, Buenos Aires, p. 285, *albicinctus*, C. G. H., *latevittatus*, Port Natal, p. 286, *pruinosus*, Ceylon, *varians*, Port Natal, p. 287, *nubianus*, Khartoum, *plumiferus*, Cuba, p. 288, *fulvus*, Am. sept., *geniculatus*, Buenos Aires, p. 289, *bilimbatus* and *infuscatus*, New Caledonia, p. 290, *leucocerus*, Moluccas (? gen. *Muscina*, Rob.-Desv.), *fulviventris*, California, p. 291, *id. t. c.*

Lispa lestremensis, Gallia, *hirtibasis*, p. 292, *spinipes*, *hottentotta*, p. 293, C. G. H., *id. t. c.*

Yetodesia dubia, *chilensis*, Chili, p. 294, *antarctica*, Australia, p. 295, *id. t. c.*; these possibly would be more correctly placed in *Helina*, *id. t. c.* p. 296.

Anthomyia sancti-jacobi, p. 296, *rubifrons*, p. 297, Chili, *monticola*, Am. sept., p. 297, *cothurnata*, *dubia*, Chili, *anthracina*, Am. sept., p. 298, *oculifera*, Baltimore, p. 299, *id. t. c.*

Hylemyia flavicaudata, Am. sept., p. 299, *andicola*, Chili, *ornata*, Port Natal, p. 300, *tricolor*, Port Natal, p. 301, *id. t. c.*

Dialyta bicolor, Mexico, p. 302, *id. t. c.*

Ophyra argentina, p. 302, Buenos Aires, *setosa*, *hirtula*, p. 303, *andina*, *pusilla*, p. 304, Chili, *id. t. c.*

Cordyluridæ.

Ceratinostoma, g. n., between *Scatophaga* and *Cordylura*, for *Scatophaga oceana*, Macq., Ent. M. M. p. 178 (= *C. maritinum*, Meade), England and France; Meade, Ent. M. M. xxii. p. 152.

Sciomyzidæ.

Tetanocera, *cf. Ortalidæ*, *Euphyæ*.

MICROPEZIDÆ.

Micropeza limbata, Porto Rico, sp. n., Röder, S. E. Z. xlvi. p. 347.

Nerius cinereus, Porto Rico, sp. n., *id. t. c.* p. 348.

Calobata ichnemonea, Mexico, sp. n. ?, informally characterized, Brauer, Verh. z.-b. Wien, xxxv. p. 388.

ORTALIDÆ.

[*Cf.* Wulp (374).]

Wulp, Tijdschr. Ent. xxviii. p. 213, &c., comments on *Campylocera*, Macq., and *Lamprogaster*, Macq. (= *Chromatomyia*, Walk.), and notices at length several of their species; also *Scholaster cinctus*, Guer., and *Angitula cyanea*, Walk.

MIK, J. Ueber die Dipteren-Gattung *Hypochra*, Lw. Wien. ent. Z. iv. pp. 277–283. [*Melliera subapennina* and *parmensis*, Rond., belong to this genus, the 4 species of which are described at length. *H. atricornis*, Curt., sp. n., Europe, p. 281.]

Campylocera fuscipes, p. 216, pl. vii. figs. 1 & 2, *longicornis*, p. 218, pl. vii. figs. 3 & 4, Java, *nubilipennis*, Africa, p. 220, pl. vii. fig. 5, wing, Wulp, Tijdschr. Ent. xxviii., spp. nn.

Lamprogaster elongata, Morotai, *limbata*, Waigiou, p. 228, *tæniata*, Morotai, p. 229, pl. vii. fig. 10, *pumicata*, New Caledonia, p. 230, *trisignata*, Andai, p. 231, *id. t. c.*, spp. nn.

Euphya, g. n., for *Tetanocera tripunctata*, Dolesch., *id. t. c.* p. 222.

Teretrura, g. n., for *T. flaveola*, sp. n., Chili; Bigot, Bull. Soc. Ent. Fr. (6) v. p. clxv.

Stictomyia, g. n., near *Platystoma*, for *S. longicornis*, sp. n., Mexico; *id. t. c.* p. clxvi.

TRYPETIDÆ.

Ceratitis. Note on the genus, saying that it belongs to *Dacini*, and on *C. capitata* and *C. punctata*, with synonymy of the former; Röder, B. E. Z. xxix. pp. 132 & 133. *C. nitida*, p. 134, *bimaculata*, p. 135, *albomaculata*, p. 136, Delagoa Bay, *id. t. c*, spp. nn.

OPOMYZIDÆ.

Tetanura. This genus should be placed in *Opomyzini*, not in *Tanypezini*, as located by Schiner; characters are mentioned in support of this opinion: Röder, B. E. Z. xxix. p. 131.

OSCINIDÆ.

Chlorops tæniopus and *Oscinis frit*. Ravages in Gottland in 1883 and 1884; Ent. Tidskr. vi. pp. 179–183.

Meromyza americana, Fitch. Habits and parasites; Riley, Rep. Ent. 1884, p. 389.

Oscinis brassicæ, Missouri, sp. n., *id. t. c.* p. 322, pl. viii. fig. 6 (erroneously in text, fig. 5).

Phoridæ.

Discussion of habits of *Phora aletiæ*, with figures of metamorphoses; Riley, Fourth Rep. U. S. Ent. Comm. pp. 116–119.

Phytomyzidæ.

Phytomyza annulipes, Meig., is a Cecidozoon, forming galls on *Artemisia campestris*; Karsch, Ent. Nachr. xi. p. 344.

Hippoboscidæ and Nycteribiidæ.

Diptera Pupipara discussed, Brauer (42) p. 392, &c.

Ornithomyia tenella, Schin., and *Stenopteryx hirundinis*, L. Biological observations on; JB. Ver. Osnabr. vi. p. 173.

Hippobosca sivæ, p. 235, Ind. or., *calopsis*, p. 236, Ceylon, spp. nn., Bigot, Ann. Soc. Ent. Fr. (6) v.

Olfersia maura, Algeria, *impressa*, California, p. 237, *lividicolor*, Brazil, p. 238, *sordida*, Guatemala, *erythropsis*, p. 239, *noumeana*, New Caledonia, *capensis*, Cape G. H. p. 240, spp. nn., *id. t. c.*

Ornithomyia hova, Madagascar, p. 241, *nitens*, Panama, p. 241, *fuscipennis*, Colombia, *haitensis*, Haiti, p. 242, *ruficentris*, Brazil, p. 243, *kanakorum*, *ænescens*, New Caledonia, p. 244, *varieyata*, New Zealand, p. 245, spp. nn., *id. t. c.*

Nycteribia mexicana, p. 245, Mexico, *oceanica*, New Caledonia, *fulvida*, Cape G. H., p. 246, spp. nn., *id. t. c.*

(APHANIPTERA.)

Pulicidæ.

Pulicidæ discussed, Brauer (42), p. 395, &c., &c.

Rhynchoprion penetrans, contribution to natural history of; Grouet, Le Nat. vii. pp. 6 & 13.

Vermipsylla, g. n. (*Sarcopsyllidarum*), for *V. alakurt*, sp. n., Turkestan, Schimk., Zool. Anz. viii. p. 75; the description reproduced, Ann. N. H. (5) xv. pp. 270–273. This insect is reputed as very injurious to herds in Turkestan.

(E.) *RHYNCHOTA.*

[*Cf.* Ferrari (108), Osborn (236), Sahlberg (295), Signoret (316), Wedde (357), Wielowiejski (362).]

Pterygodimorphism in some *Hemiptera* noticed; Tijdschr. Ent. xxviii. p. xiii.

Hemiptera. Carboniferous fossil mentioned; Brongniart, Bull. Soc. Ent. Fr. (6) iv. p. clii.

Sibiriska *Hemiptera*, antecknade af O. M. Reuter; Öfv. Finsk. Vet. Soc. Förh. xxvi. pp. 22–35. 140 species are mentioned.

HEMIPTERA-HETEROPTERA.

[*Cf.* Jakowleff (156).]

Synonymische Bemerkungen über Hemipteren von O. M. Reuter, B. E. Z. xxix. pp. 39–47, consists of synonymical discussions on 24 species, some of which cannot be here summarized, though the others are enumerated in their respective positions. The former relate to *Gnathoconus limbosus*, Geoffr., *Ochetostethus nanus*, H. Sch., *Eurydema ornatum*, L., *E. festivum*, L., *E. oleraceum*, L., *Carpocoris varius*, F., *Piezodonus lituratus*, F., *Nysius ericæ*, Schill., *Serenthia femoralis*, Th., the species of *Tingis* described by Schillings, *Tingis pilosa*, Schum., *Trigonotylus ruficornis*, Geoffr., *Calocoris schillingii*, Scholtz, *Lygus lucorum*, Mey., *Labops signatus*, Fieb.

Puton, Rev. d'Ent. iv. p. 137, records the following synonymy of Garbiglietti's species:—*Ochetostethus nanus*, H. S. (= *Cydnus cinnamomeus*, Garb.); *Lygæus creticus* (= *6-maculatus*); *Monanthia auriculata* (= *unicolor*); *Aradus betulæ* (= *geneonymus*); *Capsus punctum* var. (= *corruscus*); *Anthocoris nemoralis* var. *austriacus* (= *rubicundulus*); *Triphleps nigra* (= *A. neglectus*); *T. minuta*, L. (= *pellucidus*); *T. testaceus*, Perris (= *fasciiventris*); *T. testaceus*, Muls. (= *flavicans*, = *B. rufescens*, Costa); *Leptopus hispanus* (= *strobeli*); *Pirates strepitans* (= *coracinus*); *Corisca scripta* (= *glauca*).

Duda, Lad. Beitrage zur Kenntniss der *Hemiptera*-Fauna Böhmens. Wien. ent. Z. iv. pp. 33, 67, 99, 137, 169, 209, 237, 257, & 293.

This faunistic list contains observations on habits, &c.; it extends to *Salda*.

Pentatomidæ.

Thyreocoris pulicarius, Germ. Eggs described; Riley, Rep. Ent. 1884. p. 390.

Phimodera (sub *Podops*) *galgulina*, H. Sch. (= *Scutellera obtusata*, Kryn.); *Psacasta exanthematica*, Scop. (= *Scutellera albopunctata*, Kryn.); *Trigonosoma rusticum*, Fab. (= *Scutellera trigona*, Kryn.); *Neottiglossa pusilla*, Gmel. (= *Aelia panzeri*, Kryn.); *Chrysantha ornatula*, H. Sch. (= *Poecilocoris scitulus*, Jak.); *Eurydema wilkinsi*, Dist. (= *Strachia conspicua*, Jak.): Reut., B. E. Z. xxix. p. 158.

Murgantia histrionica. History and natural-history, and remedies; Riley, Rep. Ent. pp. 309–312, pl. iv. fig. 2.

Podops tangira, Fab., distinct from *inuncta*; Rev. d'Ent. iv. p. 353.

Agatarchus, Stål. (= *Barbiger*, Jak.); Reut., B. E. Z. xxix. p. 41.

Eurydema dominulum, Scop., var. *thesgica* (= *dauricum*, Motsch.); *id. t. c.* p. 40. *E. fieberi*, Schum. (= *Strachia dominula*, Fieb., = *Pentatoma dominulus*, H. Sch., = *P. schafferi*, Gorski); *id. t. c.* pp. 40 & 41. Note on the variation of *E. oleraceum*, L., with woodcuts; Horvath, Rov. Lapok, ii. pp. 74–81 & 172, & Suppl. pp. xii.–xiv.

Clinocoris, *cf.* Reitter (278). Note on Reuter's synonymy of *C. griseus* and *interstinctus*; Dougl., Ent. M. M. xxi. p. 276.

Ditomotarsus, Spin., characterized; Sign., Ann. Soc. Ent. Fr. (6) v. p. 63.

New genera and species:—

Promecosoma, p. 103, for *P. laticollis*, sp. n., Achal-Tekke, p. 105, Jak., Hor. Ent. Ross. xix.

Ochyrotylus, p. 113, for *O. helvinus*, p. 115, *signoreti*, p. 116, spp. nn., Achal-Tekke; *id. t. c.*

Cellobius, p. 116, near *Brachynema*, for *C. abdominalis*, sp. n., Achal-Tekke, p. 117; *id. t. c.*

Eurygaster schreiberi, Illyria, p. 171, pl., fig. 2, *minor*, France, p. 172, pl., fig. 1, Montand., Rev. d'Ent. iv.

Odontotarsus flavus, Achal-Tekke, Jak, Hor. Ent. Ross. xix. p. 102.

Trigonosoma productum, Achal-Tekke, *id. t. c.* p. 106.

Putonia asiatica, Achal-Tekke, *id. t. c.* p. 108.

Leprosoma olcesii, Morocco, Fairm., Rev. d'Ent. iv. p. 354.

Amaurocoris orbicularis, Achal-Tekke, Jak., *t. c.* p. 110.

Aelia sibirica, Siberia, Reut., Öfv. Finsk. Vet. Soc. Förh. xxvi. p. 31.

Eusarcoris scutellaris, Achal-Tekke, Jak., *t. c.* p. 112.

Clinocoris antennatus, Europe, Reut., Ent. M. M. xxii. p. 38.

Ditomotarsus hyadesi, Beagle Straits, Sign., Ann. Soc. Ent. Fr. (6) v. p. 63.

Coreidæ and Berytidæ.

Rhopalus and *Corizus*. Note on the utility of these names; Reut., B. E. Z. xxix. p. 42.

Dulichius clavifer, Walk. (= *Helopeltis braconiformis*, Walk.); Waterh., P. E. Soc. 1885, p. xxvii.

Alydus tangiricus, Saund. (= *Hecgeria adspersa*, Reut.), but the species belongs to the latter genus; Reut., B. E. Z. xxix. p. 42.

Camptonotus, g. n. (*Coreidæ*), p. 118, for *C. maculatus*, Achal-Tekke, p. 119, sp. n.; Jak., Hor. Ent. Ross. xix.

Nondescript insect resembling *Neides* figured and described; Tepper, T. P. Soc. S. Austr. vii. p. 47, pl. iii. A.

Les Bérytiens de la Hongrie; Horvath, Rov. Lapok, ii. pp. 200–208, figs., & Suppl. p. xxvi.

Berytus hirticornis, Br. (= *trichocerus*, Scholtz); Reut., B. E. Z. xxix. p. 43. *B. consimilis*, p. 320, *geniculatus*, p. 321, Europe, spp. nn., Horv., Rev. d'Ent. iv.

Lygæidæ and Pyrrhocoridæ.

Ad cognitionem *Lygæidarum* palæarcticarum, Reuter (277), Rev. d'Ent. iv. pp. 199–233, consists of a series of smaller memoirs and tables. Besides the novelties mentioned below in their respective positions, the contents are as follows:—I. Ad cognitionem divisionis *Lygæaria*, Stål: table of the genera and subgenera, pp. 199 & 200; conspectus specierum generis *Lygæus*, pp. 201 & 202; tables of the species of *Melanotelus*, p. 202, *Apterola*, p. 203 [with full description of *A.* (*Lygæosoma*) *lownii*, Saund.], and of *Lygæosoma*, p. 205. II. Ad cognitionem subfamiliæ *Blissina*, Stål: table and full descriptions of the species of *Rhyparochromus*, pp. 207–211. III. Species duæ novæ generis *Geocoris*, viz. IV. Ad cognitionem divisionis *Rhyparochromaria*, Stål: table of species of *Proderus*, p. 213, and full description of *P. amabilis*, Put. V. Ad cognitionem divisionis *Beosaria*, Stål: new tabulation of the genera, pp. 217–220, with the following new subgenera of *Pachymerus*, viz., *Microtomideus*, p. 218, *Liolobus*, *Bleteogonus*, p. 219, *Ragliodes*, p. 220; tabulation of the species of *Pachymerus*, pp. 221–229, with full descriptions (in addition to novelties) of *P.* (*Microtomideus*) *leucoderma*, Fieb., p. 222, *P.* (*Liolobus*) *walkeri*, Saund, p. 224, *P.* (*Bleteogonus*) *beckeri*, Frey-Gess., p. 225, *P.* (*Ragliodes*) *delineatus*, Ramb., p. 229. VI. *Emblethis pallens*, sp. n. (v. *infrà*). VII. Ad cognitionem subfamiliæ *Pyrrhocorina*, Stål: table of the genera and of the species of *Pyrrhocoris*, Fall., pp. 231 & 232. Much synonymy is given in notes and the text (certain previously described species being referred to other genera), of which we reproduce the following:—*Dimorphopterus blissoides*, Baer. (= *signoretii*, Kusch., = *staphylinus*, Jak.), p. 211; *Piezoscelis staphylinus*, Ramb. (= *Megalonotus angustatus*, Fieb.), p. 216; *Microtoma atrata*, Goeze (= *atramentaria*, Geoffr., &c., &c.), p. 220; *Calyptonotus rolandri*, L., vars. (= *M. angustula*, Reut., *morio*, Gradl.), p. 221; *Pyrrhocoris coriaceus*, Scott, 1874 (= *P. tibialis*, Stål, 1874), p. 233.

Nysius angustatus. History and habits; Riley, Rep. Ent. pp. 315 & 316, pl. v. fig. 2.

Ischnorrhynchus resedæ var. n. *flavicornis*, Hungary, Duda, Wien. ent. Z iv. p. 170.

Kleydocerus pœcilus, Spin., found in Tierra del Fuego and described at length; Sign., Ann. Soc. Ent. Fr. (6) v. p. 67.

Summary of biological and economical knowledge of *Blissus leucopterus*; Thomas, Ency. Am. ii. p. 75.

Germalus. Stenophthalmicus, Costa, is identical with this: Fairm., Rev. d'Ent. iv. p. 355.

Neurocladus brachiidens, Duf. (= *Acompomorpha acerrima*, Jak.); Reut., B. E. Z. xxix. p. 159.

New genera and species :—

Melanotelus, for *Lygæosoma villosulum*, Stål, *L. bipunctatum*, Dall, and *L. argillaceus*, Mauritius, sp. n.; Reut., Rev. d'Ent. iv. pp. 202 & 203.

Parapolycrates, near *Polycrates*, for *P. ciliatus*, sp. n., S. Russia, *id. t. c.* p. 216.

Lygæosoma angulare, Corfu, *id. t. c.* p. 206.

Ischnodemus jaxartensis, Turkestan, *id. t. c.* p. 209.

Geocoris alaiensis, p. 211, *feltschenkoi*, p. 212, Turkestan, *id. t. c.*

Henestaris geocoriceps, France, Antess., Rev. d'Ent. iv. p. 112.

Germalus tingitana, ? Morocco, Fairm., Rev. d'Ent. iv. p. 354.

Microplax conspersa, Achal-Tekke, Jak., Hor. Ent. Ross. xix. p. 120.

Piezoscelis putoni, Tunis, Reut., Rev. d'Ent. iv. p. 215.

Peritrechus oculatus, Achal-Tekke, Jak., Hor. Ent. Ross. xix. p. 121.

Microtoma syriaca, Caiffa, Reut., Rev. d'Ent. iv. p. 220.

Pachymerus (*Microtomideus*) *mœrens*, Syria, p. 222, *dasycnemis*, Algeria, p. 223, *P.* (*Bleteogonus*) *circumcinctus*, Turkestan, p. 226, *P.* (*Xanthochilus*) *minusculus*, Corfu, p. 227, *id. t. c.*

Pachymerus (*Xanthochilus*) *reuteri*, Europe, Horv., Rev. d'Ent. iv. p. 321.

Emblethis pallens, Tangier, *id. t. c.* p. 230.

Pyrrhocoris sinuaticollis, Vladivostock, *id. t. c.* p. 232.

Dindimus debyi, Sumatra, Leth., C.R. Ent. Belg. 1885, p. civ.

Tingitidæ and Aradidæ.

Monanthia montandoni, E. Europe, sp. n., Horv., Rev. d'Ent. iv. p. 322.

Bergroth, note on *Mezira*, Wien. ent. Z. iv. p. 181, considers that *Mezira* and *Brachyrrhynchus*, Am. & Serv., are the same genus, and remarks on the subdivision of the genus and certain little known species. *B. usurpatus*, n. n. for *granulatus*, Say, *nec* A. & S.; *id.* p. 182.

Aradus betulæ: the synonymy of the species of this group discussed and characters tabulated; Reut., Wien. ent. Z. iv. p. 149. *A. komarowii*, Achal-Tekke, Jak., Hor. Ent. Ross. xix. p. 122; *A. montandonii*, Moldavia, Reut., Wien. ent. Z. iv. p. 147; *A. orientalis*, p. 7, Japan, *emarginatus*, p. 8, China, Bergroth, Ent. M. M. xxii.: spp. nn.

Isodermus, Er. The position of this genus, which is one of the most abnormal of the *Heteroptera*, must remain doubtful; it cannot be in *Aradites*, where it was placed by Stål. *I. gayi*, Spin., described at length. Sign., Ann. Soc. Ent. Fr. (6) v. p. 65.

Capsidæ.

Lopus bicolor, Fieb. (= *Calocoris sanguineus*, Jak.); *Oncognathus binotatus*, Fab. (= *Stenotus sareptanus*, Jak.); *Megalobasis linæ*, Put. (= *Camptotylus aphidioides*, Jak.); Reut., B. E. Z. xxix. p. 159.

Calocoris alpestris (= *C. pabulinus* var. *major*, Scholtz); *id. t. c.* p. 46.

Phytocoris punctuiv var. n. *reuterianus*, Morocco, Fairm., Rev. d'Ent. iv. p. 355.

Lygus lineolaris. History and habits, with note on its nomenclature; Riley, Rep. Ent. pp. 312–315 & 391, pl. iv. figs. 3 & 4.

Deraeocoris rutilus var. *bellicosus*; *D. schach* var. *novaki*: Horv., Rev. d'Ent. iv. p. 324.

Pilophorus confusus, Kirschb. (= *Capsus clavatus*, Hahn.); Reut., B. E. Z. xxix. p. 47.

Atractotomus morio, Sahl., ♀ described; Reut., Öfv. Finsk. Vet. Soc. Förh. xxvi. p. 26.

Helopeltis braconiformis, Walk., *cf. Dalichius, Coreidæ*.

New genera and species :—

Litoxenus, for *L. tenellus*, sp. n., Hungaria; Reitt., C.R. ent. Belg. 1885, p. xlv.

Acrotelus, for *A. loewii*, sp. n., Austria; *id. t. c.* p. xlvi.

Allaeotarsus, for *A. vitellinus*, sp. n., Portugal; *id. t. c.* p. xlvii.

Megacœlum elegantulum, Achal-Tekke, Jak., Hor. Ent. Ross. xix. p. 124.

Lygus rhamnicola, Finland, Reut., Medd. Soc. Fenn. xi. p. 164; *L. brachycnemis*, Algeria, *id.* C.R. ent. Belg. 1885, p. xliii.

Dicrooscytus intermedius, Saxony, *id. t. c.* p. xlii.

Camptobrochis putoni, Dobrudska, Mont., Rev. d'Ent. iv. p. 281.

Pœciloscytus (*Systratiotus*) *diversipes*, Hungary, Horv., Rev. d'Ent. iv. p. 323.

Capsus intermedius (= *C. simulans* var., Sahl.), Siberia, Reut., Öfv. Finsk. Vet. Soc. Förh. xxvi. p. 25.

Orthotylus quercicola, Austria, p. xliii., *paulinoi*, Portugal, p. xliv., *id.* C.R. ent. Belg. 1885.

Plagiognathus retovskii, Tauria, *id. t. c.* p. xlviii.

Anthocoridæ.

Acanthia dubia, Siberia, sp. n., Reut., Öfv. Finsk. Vet. Soc. Förh. xxvi. p. 27.

I extract the following list of new genera and species from Reuter's Monographia Anthocoridarum (275), Act. Soc. Fenn. xiv., referring to the work itself for the classification, synonymy, &c. :—

Metriosteles, subg. n. of *Lyctocoris*, p. 562, with *spangbergii*, p. 562, and *signoretii*, p. 563, spp. nn., Colombia; *id. t. c.*

Euspudæus, g. n., p. 566, for *Anthocoris funebris*, Motsch.; *id. t. c.*

Lasiochilus basalis, Colombia, p. 569, *galatew*, Brazil, p. 570, *unicolor*, Colombia, p. [illegible] *leicollis*, Brazil, p. 573, (*Dilasia*) *corticalis*, Pulo Milú, p. 575, spp. [illegible] *Hemiotoscelis*, subg. n., p. 578) *curvicrus*, Brazil, p. 578, sp. n.; *id. t. c.*

Lasiocolpus, g. n., p. 582, for *L. sinuaticollis*, Mexico, *elegans*, Colombia, spp. nn.; *id. ibid.*

Piezostethus afer, Damara-land, p. 592, *piceus*, Siberia, p. 595, *vicarius*,

Bogota Americæ septentrionales [*sic*], p. 599, *californicus*, California, p. 600 (*Stictosynechia*, p. 587, and *Arrostus*, p. 589, subgg. nn.) ; *id. t. c.*

Asthenidea, g. n., p. 602, for *A. constricta*, Stål (= *pallescens*, sp. n., p. 605, *cf.* corrigenda, p. 747), *C. clarus*, B.-Wh., and *punctatostriata*, Bogota, p. 604, *temnostethoides*, Illinois, p. 605, *maculipennis*, Ins. S. Thomas, p. 607, spp. nn. ; *id. t. c.*

Elatophilus, g. n., p. 615, *Temnostethi*, pars, olim, with subg. n. *Elatophilus*, p. 616, to include *nigrellus*, *stigmatellus*, and *nigricornis*, Zett., and *pini*, Baer., and also subg. n. *Euhadrocerus*, p. 619, for *T. crassicornis*, Reut. ; *id. t. c.*

Anthocoris nigripes, *fulvipennis*, p. 623, *albiger*, p. 624, Mexico, *confusus*, Europe, p. 625, *whitei*, California, p. 628, *flavipes*, Turkestan, p. 634, *melanocerus*, Colorado, p. 635, *angularis*, Turkestan, p. 638, spp. nn. ; *id. t. c.*

Triphleps horvathi, Hungary, p. 649, *albidipennis*, N. Africa, p. 650, *fuscus*, Colombia, p. 653, *perpunctatus*, Mexico, p. 654, *indicus*, Bengal, *punctaticollis*, Ashanti, p. 655, *pallidicornis*, Corsica, Sicily, p. 656, *madeirensis*, Madeira, p. 657, *laticollis*, Italy, p. 661, *discolor*, Turkestan, p. 664 (*Dimorphella*, subg. n., p. 646, for *A. agilis*, Flör.) ; *id. t. c.*

Brachysteles pallidus, Ins. S. Thomas, p. 672, *dubius*, S. France, p. 673 (*Dysepicritus*, subg. n., p. 670, for *A. rufescens*, Costa ; *Wollastonella*, subg. n., p. 676, for *Capsus ? obesulus*, Woll.) ; *id. t. c.*

Physopleurella, g. n., p. 678, for *Cardiastethus mundulus*, B.-Wh. ; *id. t. c.*

Buchananiella, g. n., p. 680, for *C. sodalis*, *continuus*, B.-Wh, and *whitei*, Tasmania, p. 683, sp. n. ; *id. t. c.*

Cardiastethus nazarenus, Syria, p. 689, *ophthalmicus*, Colombia, p. 691, *pergandei*, Am. bor., p. 695, spp. nn. (*Orthoselenia*, subg. n., p. 686, for *C. poweri* and *brounianus*, B.-Wh.) ; *id. t. c.*

Hypophlæobiella, g. n., p. 701, for *Xylocoris rogeri*, Baer. ; *id. t. c.*

Lasiella, g. n., for *L. picea*, Java, sp. n., p. 702 ; *id. t. c.*

Microphysa ruficeps, Syria, p. 729, sp. n., *id. t. c.*

Myrmedobia pubescens, Lenkoran, p. 737, *distinguenda*, Moldavia, p. 738, *angusticollis*, Syria, p. 738, spp. nn., *id. t. c.*

Oligobiella, g. n. (subfam. *Microphysina*), for *Myrmedobia fuliginea*, Buch.-White ; Reut., Ent. M. M. xxi. p. 201.

Reduviidæ.

Conorhinus sanguisuga, Lec. Its attacks on man ; Riley, Rep. Ent. 1884, p. 414.

Ploiaria zambeui, France, Mont., Rev. d'Ent. iv. p. 113, sp. n.

Opsicætus komarowii, p. 125, *elegans*, p. 126, Achal-Tekke, Jak., Hor. Ent. Ross. xix., spp. nn.

Oncocephalus impictipes, Achal-Tekke, *id. t. c.* p. 127, sp. n.

Holoptilus oraniensis, Oran, Puton, Bull. Soc. Ent. [illegible] v., p. cxix., sp. n.

Nabis borcellus, Finland, Reut., Medd. Soc. Fenn. xi. p. 165, sp. n.

Vilius varicolor, Sumatra, Leth., C.R. ent. Belg. 1885, p. civ., sp. n.

Ectrychotes marginatus, Sumatra, *id. ibid.*, sp. n.

Opistoplatys velutinus, Borneo, *id. t. c.* p. cv., sp. n.

Hydrometridæ and Corisidæ.

Ueber die pelagisch lebende Gattung *Halobates*; MT. schw. ent. Ges. vii. pp. 182–191. This is a summary of Buchanan White's recent work on these insects.

Halobates, figures of on *Fucus*, &c.; La Nature, xiii. 1, p. 188.

Corixa quadrata, Orange Bay, Cape Horn, Sign., Ann. Soc. Ent. Fr. (6) v. p. 68, sp. n.

HEMIPTERA-HOMOPTERA.

[*Cf.* Atkinson (9), Brongniart (46), Ferrari (107), Löw (198).]

Puton, Rev. d'Ent. iv. p. 138, records the following synonymy of Kirschbaum's species:—*Delphax pellucida* (= *piceola*, Kb.); *leptosoma* (= *fuscipennis*); *concolor* (= *ochroleuca*); *flaveola* (= *fulvcola*); *Idiocerus vitreus* (= *auronitens*); *elegans* (= *rutilans*); *Athysanus obscurellus* var. (= *sejungendus*); *obsoletus* var. 6-*punctatus* (= *convexus*); *Deltocephalus multinotatus* (= *micantulus*); *argus* (= *elegantulus*); *distinguendus*, ♂ (= *mattiacellus*); *distinguendus*, ♀ (= *inclusivalvus*); *rhombifer* (= *curvilobus*); *linnei* (= *longiceps*).

Cicadidæ.

Cicada septendecim, L., and its races and their chronological appearances; *cf.* Riley (284). The periodical *Cicada*, Science, v. pp. 518–521; the writer (C. V. Riley) considers that the species is being exterminated by the introduced *Passer domesticus*. The periodical *Cicada* on Staten I.; Riley, Ent. Am. i. p. 91. *Cicada septendecim*: its song-notes described; *id.* Science, vi. p. 264. The periodical *Cicada*, extract and translation of Riley on; S. E. Z. xlvi. pp. 370–373. *C. plebeia*: organs of flight; Amans, Ann. Sci. Nat. (6) xix. pp. 109–128, pls. iv. & v.

Platypleura assamensis, Assam, p. 212, *distincta*, Nicobar Is., pp. 213 & 233, *roepstorffii*, Andaman Is., p. 214, Atk., J. A. S. B. liii. spp. nn.

Proarna capistrata, Buenos Aires, Dist., Ent. M. M. xxii. p. 60, sp. n.

Cercopidæ and Fulgoridæ.

Larva cases of *Ptyelus* sp., *cf.* Ratte (266).

Fulgora lanternaria not luminous; Branner, the reputation of the Lantern-fly, Am. Nat. xix. pp. 834–838.

Issus dilatatus, *Hysteropterum grylloides*, *maculifrons*, *Lepyronia coleoptrata*: nymphæ described; Ferrari, Bull. Ent. Ital. 1885, pp. 274 *et seq.*

Achorotile. Note on the genus; Ent. M. M. xxii. p. 66.

New genera and species :—

Chlorionidea (*Delphacinorum*), p. 356, for *C. flava*, sp. n., Austria, p. 357, Löw, Verh. z.-b. Wien, xxxv.

Ipsnola, resembling *Cixius*, p. 69, for *I. sextuberculata*, sp. n., Chili, p. 70; Sign., Ann. Soc. Ent. Fr. (6) v.

Fulgora connectens, Tenasserim, p. 130, *amplectens*, Perak, p. 133, Atk., J. A. S. B. liv. pt. 2.

Myctenodus orthocephalus (Fieb., ined.), Italy, Ferr., Bull. Ent. Ital. 1885, p. 272.

Jassidæ.

Description des Cicadines d'Europe des genres *Cicadula* et *Thamnotettix*, par Fr. X. Fieber (traduit de l'allemand sur le manuscrit original par F. Reiber), avec des additions par L. Lethierry ; Rev. d'Ent. iv. pp. 40–110. Comprises elaborate descriptions of the species, in addition to tables. [Continuation, *cf.* Zool. Rec. xxi. *Ins.* p. 312.]

Löw gives the following synonymy :—*Idiocerus signatus*, Fieb., = (? *rutilans*, Kbm.), p. 343 ; *Pediopsis scutellata*, Boh., = (*rubi*, Boh.), *id.* ; *Agallia sinuata*, M. & R., = (*fieberi*, Vism.), p. 346 ; *Chlorita flavescens*, F., = (*Typhlocyba vitis*, Göthe), p. 348 ; *Deltocephalus multinotatus*, Boh., = (*mayri*, Fieb.), *assimilis*, Fall. (= *xanthoneurus*, Fieb.), pp. 352 & 353 ; *Penthimia nigra*, Goeze, = (*atra*, Fab.), p. 355 : Verh. z.-b. Wien, xxxv.

Tettigonia viridis, *Selenocephalus obsoletus* : nymphæ described ; Ferrari, Bull. Ent. Ital. 1885, pp. 274 *et seq.*

New genera and species :—

Anoterostemma (*Jassinorum*), p. 353, for *A. henschii*, Carniola, sp. n., p. 354 ; Löw, Verh. z.-b. Wien, xxxv.

Zyginella (*Typhlocybinorum*), for *Z. pulchra*, Austria, sp. n. ; *id. t. c.* p. 346.

Idiocerus angustiloris, Siberia, Reut., Öfv. Finsk. Vet. Soc. Förh. xxvi. p. 33.

Pediopsis limbo-punctata, Siberia, *id. t. c.* p. 29.

Agallia dimorpha, Austria, Löw, Verh. z.-b. Wien, xxxv. p. 344.

Athysanus thenii, p. 350, *truncatus*, p. 351, Austria, *id. t. c.*

Cicadula limbata, Europe ?, Fieb., Rev. d'Ent. iv. p. 43.

Aconura putoni, Hungary, Leth., Rev. d'Ent. iv. p. 111.

Thamnotettix acutus, Austria, p. 349, Löw, Verh. z.-b. Wien, xxxv. ; *T. affinis*, Sarepta, p. 79, *tapina*, Corsica, p. 92, *viridinervis*, Spain, p. 93, *beckeri*, Sarepta, *pellucida*, Corsica, p. 94, *prolixa*, France, p. 102, *algirica*, Oran, p. 103, Fieb. & Leth., Rev. d'Ent. iv. ; *T. discoidalis*, *adspersula*, Borneo, Leth., C.R. ent. Belg. 1885, p. cv.

Athysanus maculaticeps, Siberia, Reut., Öfv. Finsk. Vet. Soc. Förh. xxvi. p. 34.

Deltocephalus rotundiceps, France, Leth., Rev. d'Ent. iv. p. 111.

Dicranoneura similis, England, Edw., Ent. M. M. xxi. p. 229 (cut).

Typhlocyba salicicola, England, *id. t. c.* p. 230.

Psyllidæ.

[*Cf.* Witlaczil (369).] The species specially referred to being *Psyllopsis fraxinicola*, *Rhinocola speciosa*, *Psylla buxi*, *P. alni*, *P. foersteri*, *P. cratægi*, *Homotoma ficus*, *Trioza rhamni*, and *T. urticæ*.

Psylla buxi in N. America; Riley, Rep. Ent. p. 410.
Galls of *Psylla duvauæ*, Scott, note on; Ent. Nachr. xi. p. 130.

APHIDIDÆ.

[*Cf.* Kessler (164), Lichtenstein (193), Macchiati (201), Maskell (209).]
Account of discoveries of Lichtenstein and others as to the development of *Aphididæ*, &c.; Reuter, Öfv. Finsk. Vet. Soc. Förh. xxvi. pp. 223 *et seq.*

Pemphigus xylostei, Göldi (125).

Tychea phaseoli, Karsch (162).

Biology of *Tetraneura ulmi*, L.; Horvath, Rov. Lapok, ii. pp. 153–160, pl. i.

Schizoneura lanigera, Kessler (165); at Vienna, SB. z.-b. Wien, xxxv. p. 25.

GOLDI, E. A. Studien über die Blutlaus (*Schizoneura lanigera*). Schaffhausen: 1885. [*Cf.* MT. schw. ent. Ges. vii. p. 158.]

Phylloxera. [*Cf.* Chauzit (71), Lemoine (187).] In Hungary; Rov. Lapok, ii. Supp. p. xix. Notes on; Riley, Rep. Ent. 1884, pp. 405–409. Its extension in the Rhine province; Heyden, Deutsche e. Z. xxix. pp. 10 & 11. In Alsace-Lorraine; Bull. Soc. Colm. 1883–1885, p. 551. Traitements d'extinction contre le *Phylloxera* en Algérie; La Nature, xiii. 2, pp. 295–298. Études sur la reproduction du *Phylloxera*; distribution du sulfure de carbone dans le sol par les machines: C.R. c. pp. 31. (For other notes on *Phylloxera* in C.R., see its index, p. 1640, under heading, "Viticulture.")

Phylloxera punctata, biological note on; CR. Ass. Fr. Sci. 1884, ii. p. 320: and on 3 insect larvæ destroying it, *t. c.* p. 326 (two unidentified, the other *Scymnus* sp.).

Chermes abietis and *strobilobius*. *Cf.* Löw (196).

"Suggested name—*Kermaphis pini*, Koch, var. *lævis*;" Mask., Tr. N. Z. Inst. xvii. p. 16. The insect described, *ibid*, and figured, *ibid.*, pl. xvii. [*cf.* Zool. Rec. xxi. *Ins.* p. 317]. *Kermaphis* is suggested for use in *Aphididæ* in place of *Chermes*, which name Mask. proposes to transfer to *Coccidæ*.

Zur Naturgeschichte der Fichtengallenlaus (*Chermes abietis*); Glaser, Ent. Nachr. xi. pp. 234–239 & 324–328.

An unusual *Aphis* migration in N. Kent described; Ent. xviii. pp. 254–257.

Note on the biological evolution of the *Aphides* of the genus *Aphis*; Lichtenstein, Ann. N. H. (5) xv. pp. 155 & 156.

Completion of the history of *Chaitophorus aceris*, Fab., *id.* p. 273. These are translated from C.R. [*Cf.* Zool. Rec. xxi. *Ins.* pp. 314–316.]

Aphis humuli ravages, its migration from sloe to hop, &c.; Orm., Rep. viii. pp. 43–57. Kessler (164) gives life-histories of *A. padi*, L., *evonymi*, Fab., *viburni*, Scop., *mali*, Fab., *pyri*, Koch., *sambuci*, L. *A. brassicæ*: history and habits; Riley, Rep. Ent. pp. 317–319, pl. vii. fig. 4. *A. heliotropii*, p. 59, *brunnea* (on species of *Ononis*), p. 61, *polygoni*, p. 63, *robiniæ*, p. 65, N.W. Italy, Macch., Bull. Ent. Ital. 1885. spp. nn.

Phorodon calaminthæ, N.W. Italy, on *Calamintha clinopodium*, *id. t. c.* p. 54, sp. n.

Siphonopora poæ, p. 62, *farcsta* (on *Rubus idæus*), p. 67, N.W. Italy, *id. t. c.*, spp. nn.

Coccidæ.

[*Cf.* Maskell (208), Targioni-Tozzetti (338).]

Chermes or *Kermes*. Maskell, Tr. N. Z. Inst. xvii. pp. 17 & 18, considers this name should be used in *Coccidæ*, not in *Aphididæ*, and gives a list of the species to be included in "*Kermes*."

Targioni-Tozzetti specially notices *Aonidia aurantii*, *Mytilaspis flavescens*, and *gloverii*, *Chionaspis evonymi* ; Bull. Ent. Ital. 1885, pp. 108–113 : also *Guerinia serratulæ*, Fab., with woodcuts, p. 118.

Westwoodia sp. n.? (= *Dactylopius mammillariæ*, Targ.-Tozz., *nec* Signor.), Targ.-Tozz., *t. c.* p. 116, and woodcuts.

Pulvinaria innumerabilis : history, synonymy, remedies, &c., pp. 350-355. Metamorphoses, &c., pl. x.; Riley, Rep. Ent. *P. linearis*, on *Camelia japonica*, Targ.-Tozz., Bull. Ent. Ital. 1885, p. 113, and woodcuts.

Aspidiotus nerii, *cf.* Schmidt (308) ; *A. carpodeti*, New Zealand, sp. n., Mask., Tr. N. Z. Inst. xvii. p. 21, pl. vii. figs. 1 & 2.

Mytilaspis pyriformis, Mask., noticed, *id. t. c.* p. 22 ; *M. epiphytidis*, New Zealand, *id. t. c.* p. 21, pl. vii. fig. 3, sp. n.

Chionaspis dysoxyli, New Zealand, *id. t. c.* p. 22, pl. vii. figs. 4–6, *minor*, p. 23, spp. nn ; *C. citri*, Comst., occurs in New Zealand on oranges imported from Sidney, *id. ibid.*

Fiorinia stricta and *astelicæ* noticed, some details of latter figured, pl vii. figs. 7–9 ; *id. t. c.* p. 24.

Ctenochiton viridis, p. 24, *spinosus*, *piperis*, p. 25, *flavus*, p. 26, noticed, *id. t. c.* ; *C. hymenantheræ*, p. 25, pl. vii. figs. 10 & 11, *elæocarpi*, New Zealand, p. 26, pl., figs. 12–14, *id. t. c.* : spp. nn.

Inglisia ornata, New Zealand, sp. n., *id. t. c.* p. 27, pl., figs. 15–23; *I. leptospermi* noticed, *id. ibid.*

Lecanium oleæ, Bernard, p. 28, pl., fig. 24, *hemisphæricum*, Targ., p. 29, pl., fig. 25, *mori*, Sign., p. 29, fig. 26, noted from New Zealand; *id. t. c.*

Eriococcus pallidus, New Zealand, sp. n., *id. t. c.* p. 29.

Dactylopius glaucus and *Icerya purchasi* noticed ; *id. t. c.* p. 30. *D. citri*, description of, rectified ; Signoret, Bull. Soc. Ent. Fr. (6) iv. p. cli.

NEUROPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

BRAUER, F. *Neuroptera* des Gebietes von Hernstein in Niederösterreich und der weiteren Umbegung. (An extract, pp. 20–27, from Dr. G. Beck's "Fauna von Hernstein in Niederrösterreich," Theil ii. Halfband ii. Wien: 1885, 4to.)

A list of 252 species, with localities.

DZIEDZIELEWICZ, J. Sieciówski (*Neuroptera*) i Prasiatnice (*Pseudo-Neuroptera*) zebrane na Pokuciu w ciagu lata 1883. Sprawozd. Kom. fizyjogr. xviii. pp. 225–229.

Apparently a local list of the most remarkable species found in the district of Pokucia.

HAGEN, H. A. Die devonischen Insecten. Zool. Anz. viii. pp. 296–301. ("Fossil Insects," Nature, xxxii. pp. 53-54.)

Purely controversial with regard to the Devonian fossils described by Scudder, and a reply to that author's "Earliest Winged-Insects of America" [*vide infrà*].

KING, J. J. Notes on the *Neuroptera* of Argyllshire. Tr. N. H. Soc. Glasg. (2) i. pp. 163–169. (1886; separate copies dated 1885.)

A list, with notes and localities, of 16 *Pseudo-Neuroptera*, 12 *Planipennia*, and 59 *Trichoptera*.

MCLACHLAN, R. Notes additionelles sur les Névroptères des Vosges. Rev. d'Ent. iv. pp. 1–4.

Supplementary [*cf.* Zool. Rec. xxi. *Ins.* p. 268].

——. Report on the *Neuroptera* collected by Baron Nordenskiöld during the Voyage of the 'Vega.' Vega-exped. Vet. iv. pp. 83-85.

Enumerates nymphs of a species of *Baëtis* (*Ephemeridæ*), a *Cordulia* (wing only), and three species of *Trichoptera*. [*Cf. Chilostigma præteritum*,

Walk., Zool. Rec. xxi. *Ins.* p. 271, and *Micrasema scissum*, McLach., sp. n., *t. c.* p. 292, anticipatory of this Report.]

Schneider, W. G. Verzeichniss der Neuropteren Schlesiens. Z. Ent. Bresl. (2) x. pp. 17–32.

55 *Trichoptera*, 43 *Planipennia*, and 95 *Pseudo-Neuroptera*.

Scudder, S. H. The Earliest Winged-Insects of America: a re-examination of the Devonian Insects of New Brunswick in the light of criticism, and of new studies of other Palæozoic types. Cambridge, Mass.: Published by the author, 1885, 4to, 8 pp., with 1 pl. and woodcuts.

Mainly a reply to former criticisms by Hagen on the position of these fossils, and with few exceptions retaining the original ideas. (*Cf.* Brongniart, Bull. Soc. Rouen, 1885, pp. 55–57.)

——. *Palæodictyoptera*: or the Affinities and Classification of Palæozoic *Hexapoda*. Mem. Bost. Soc. iii. pp. 320–358, pls. xxix.–xxxii.

Considering all the palæozoic winged-insects to have formed a single order, the author subdivides it into two, viz.:—Orthopteroid and Neuropteroid. To the former belong the *Protoblattariæ* and *Protophasma*; the latter is subdivided into several groups which the Recorder does not propose to analyse, and thinks this a convenient place for enumerating the new genera and species indicated, without attempting to group them vaguely under any of the families of recent forms:—*Eucænus*, g. n., p. 325, for *E. ovalis*, sp. n., *ibid.* pl. xxix. fig. 4, Mazon Creek; *Gerapompus*, g. n., *ibid.*, for *G. blattinoides*, pl. xxix. fig. 1, and *extensus*, fig. 5, spp. nn., p. 326, Mazon Creek; *Anthracothemma*, g. n., *ibid.*, for *A. robusta*, sp. n., p. 327, pl. xxx. figs. 1, 5, & 6, Mazon Creek; *Genopteryx*, g. n., *ibid.*, for *G. constricta*, sp. n., *ibid.*, pl. xxix. fig. 11, Mazon Creek; *Cheliphlebia*, g. n., p. 328, for *Ch carbonaria*, pl. xxx. fig. 8, and *elongata*, pl. xxix. fig. 7, spp. nn., *ibid*, Mazon Creek; *Genentomum*, g. n., p. 329, for *G. validum*, sp. n., *ibid.* pl. xxx, figs. 2 & 3, Mazon Creek; *Didymophleps*, g. n., p. 330, for *D. contusa*, sp. n., *ibid.* pl. xxix. fig. 6, Illinois; *Propteticus*, g. n., p. 333, for *P. infernus*, sp. n., p. 334, pl. xxxi. figs. 3 & 4, Illinois; *Dieconeura*, g. n., p. 336, for *D. arcuata*, Mazon Creek, pl. xxx. fig. 4, and *rigida*, Pennsylvania, pl. xxix. fig. 10, spp. nn., *ibid.*; *Strephocladus*, g. n., p. 337, for *Petroblattina subtilis*, Kliver; *Æthophlebia*, g. n., p. 337, for *Æ. singularis*, sp. n., p. 338, pl. xxxi. fig. 9, Mazon Creek; *Polyernus*, g. n., p. 343, for *P. complanatus*, pl. xxxii. figs. 8–11, Mazon Creek, and *laminarum*, pl. xxxi. fig. 1, Pennsylvania, *ibid.*, spp. nn.; *Gerarus*, g. n., p. 344, for *G. vetus*, pl. xxxi. fig. 6, and *mazonus*, pl. xxxii. fig. 7, spp. nn., *ibid.* (*Miamia danaë*, Scud., is referred to the same genus); *Adiphlebia*, g. n., p. 345, for *A. lacoana*, sp. n., *ibid.* pl. xxxii. fig. 6, Mazon Creek. Some previously described species are also figured.

Brauer (*cf. ante*, p. 6) recognizes the following "orders" of insects as comprised under the terms "*Neuroptera*" and "*Pseudo-Neuroptera*," viz.:—*Ephemeridæ*, *Odonata*, *Plecoptera* (= *Perlidæ*), *Corrodentia*

(= *Mallophaga*, *Atropina*, *Psocidæ*, and *Termitidæ*), *Thysanoptera*, *Neuroptera* (sensu str., = *Megaloptera* and *Sialidæ*), *Panorpatæ*, and *Trichoptera*; the *Embiidæ* are transferred to the *Orthoptera-genuina*. But these various "orders" are distributed amongst several "super-orders," in which the *Thysanoptera* remain as distinct, and the *Neuroptera*, *Panorpatæ*, and *Trichoptera* form part of a division termed *Petanoptera*, which also includes *Lepidoptera*, *Diptera*, and *Siphonaptera* (*Pulicidæ*). The remaining Pseudo-Neuropterous families in the old sense form part of the super-order *Orthoptera*.

A list of species (principally *Odonata*) taken in the province of Gerona (Catalonia) is given by Cuni y Martorell, in An. Soc. Esp. xvi. p. 66.

F. Trybom notes the occurrence of larvæ of *Trichoptera*, *Perlidæ*, *Ephemeridæ*, &c., amongst floating timber in Nordland; Ent. Tidskr. vi. pp. 163–167 & 216–218.

Trichoptera.

King, J. J., & Morton, Kenneth J. The *Trichoptera* of Scotland. Scot. Nat. (2) i. pp. 45–48, 94, & 95.

Concluded [*cf.* Zool. Rec. xxi. *Ins.* p. 269], with supplementary local species. Of 155 British species, 125 have occurred in Scotland.

Polétajeff, N. Sur les stémmates et leur faculté de vision chez les Phryganides. Hor. Ent. Ross. xviii. pp. 40–62, pl. ii. [Russian].

A list of species collected by Barrett, near Belfast, is given by McLachlan, Ent. M. M. xxii. p. 164.

Limnophilidæ.

Glyphotælius punctato-lineatus, Retz., found by Cuny-Gaudier in the Vosges; McLachlan, Rev. d'Ent. iv. p. 1.

Anomalopteryx chauviniana, Stein, recorded from the Vosges; *id. t. c.* p. 2.

Mesophylax aspersus, Ramb., var. near Dumfries; J. J. King, P. N. H. Soc. Glasg. (2) i. p. iii.

Sericostomatidæ.

Crunœcia irrorata, Curt., bred from larvæ forming quadrangular cases; K. J. Morton, Ent. M. M. xxii. p. 43.

Lepidostoma hirtum, F., bred from a quadrangular case; *id. t. c.* p. 66.

Leptoceridæ.

Berœa pullata, Curt., bred; K. J. Morton, Ent. M. M. xxii. p. 43.

Hydropsychidæ.

Stenopsyche. W. J. Wilson observed that the imagos of a species of this genus (probably *S. griseipennis*, McLach.) descend below the surface of the water; McLachlan, Ent. M. M. xxi. p. 234.

An enormous swarm of *Hydropsyche instabilis*, Curt., in Inverness-shire; J. J. King, Ent. M. M. xxii. p. 94.

Cyrnus insolutus, McLach. Additional notes from a specimen in good condition; McLachlan, Bull. Soc. Ent. Fr. (6) v. p. ccxxv.

Rhyacophilidæ.

Rhyacophila obliterata, McLach., probably new for France, found in the Vosges by Puton & Cuny; McLachlan, Rev. d'Ent. iv. p. 3.

Hydroptilidæ.

Hydroptila longispina, McLach., in Scotland; J. J. King, Ent. M. M. xxi. p. 257.

NEUROPTERA-PLANIPENNIA.

GERSTÆCKER, A. Zwei fernere Decaden australischer *Neuroptera Megaloptera*. MT. Vorpomm. xvi. pp. 84–116.

Concludes by a list of about 100 described Australian species.

A list of species noticed in Worcestershire, England, is given by J. E. Fletcher in Ent. M. M. xxi. p. 257.

Panorpidæ.

Boreus hyemalis, L., near Killin, Scotland; J. J. King, Ent. M. M. xxi. p. 257, and Scot. Nat. (2) ii. p. 64. Near Aberdeen; J. W. H. Trail, Scot. Nat. (2) ii. p. 9. In Berwickshire; James Hardy, *t. c.* p. 64.

Harpobittacus, g. n., Gerstæcker, MT. Vorpomm. xvi. p. 119, established on characters in the posterior tarsi, for *Bittacus australis*, Klug, and *nigriceps*, Selys.

Bittacus microcercus, *id. t. c.* p. 119, Peak Downs, *latipennis*, p. 120, Darjeeling, spp. nn.

Sialidæ.

DUGÈS, ALFRED. Métamorphoses d'une *Corydalis*. Bull. Soc. Z. Fr. x. pp. 429–431.

Concerns *C. lutea*, Hag., or an allied species.

Myrmeleonidæ.

BIRÓ, L. A magyarországi hangyalesö-fajok (= Les Myrméléonides de la Hongrie). Rov. Lapok, ii. pp. 177–183 & 193–200 (*cf.* also pp. xxiv.–xxvi.).

A descriptive list of 10 species (in 7 genera) found in Hungary, with notes on locality and habits.

Palpares immensus, McLach., from the Kalahari Desert; J. J. Weir, P. E. Soc. 1885, p. xxiii.

Myrmeleon europæus, McLach. (= *formicarius*, Burm. & auct., *nec* L.). According to Brauer (Neurop. Hernstein, *cf. ante*, p. 241), this insect should be known as *M. nostras*, Fourcroy, Ent. Par. ii. p. 389 (1785).

New species :—

Gymnocnemia africana, McLachlan, C.R. ent. Belg. xxix. p. xxv., Congo ; *G. tipularia*, Gerstæcker, *t. c.* p. 102, Peak Downs.

Acanthaclisis conspurcata, *id.* MT. Vorpomm. xvi. p. 88, Port Bowen and Rockhampton.

Formicaleo septus, *id. t. c.* p. 91, Peak Downs.

Myrmeleon illustris, *id. t. c.* p. 92, Sydney, *comptus*, p. 94, Peak Downs, *pictifrons*, p. 96, Sydney, *amabilis*, p. 97, Peak Downs, *congestus*, p. 99, Peak Downs, *breviusculus*, p. 100, Peak Downs ; *M. novæ-zealandiæ*, Colenso, Tr. N. Z. Inst. xvii. p. 156, New Zealand.

Creagris nubecula, Gerstæcker, *t. c.* p. 101, Rockhampton.

Ascalaphidæ.

Suphalasca spectabilis, Gerstæcker, MT. Vorpomm. xvi. p. 84, Peak Downs, *læta*, p. 85, Sydney, *mœsta*, p. 87, Peak Downs, spp. nn.

Nemopteridæ.

McLachlan, Robert. On the Discovery of a Species of the Neuropterous Family *Nemopteridæ* in South America, with general considerations regarding the Family. Tr. E. Soc. 1885, pp. 375-379.

Includes critical notes on classification, structure, &c.

Stenotænia (g. n.) *walkeri* (sp. n.), *id. t. c.* pp. 376 & 377, Chili.

Croce, g. n., *id. t. c.* p. 378, proposed for *Nemoptera filipennis*, Westw., and allied species.

Mantispidæ.

Mantispa pictiventris, sp. n., Gerstæcker, MT. Vorpomm. xvi. p. 103, Rockhampton.

Theristria eurysticta, sp. n., *id. t. c.* p. 105, Sydney and Rockhampton.

Nymphidæ.

Nymphes modesta, sp. n., Gerstæcker, MT. Vorpomm. xvi. p. 106, Rockhampton.

Nesydrion diaphanum, sp. n., *id. t. c.* p. 108, Port Bowen.

Hemerobiidæ.

Hemerobius inconspicuus, McLach., bred from larvæ found on *Pinus sylvestris* ; J. Sang, Ent. M. M. xxi. p. 192.

Drepanopteryx phalænoides, L., reoccurrence in Scotland ; K. J. Morton, Ent. M. M. xxii. p. 139. [*Cf.* P. E. Soc. 1885, p. xxv.]

Megalomus lanceolatus, sp. n., Gerstæcker, MT. Vorpomm. xvi. p. 110, Sydney.

Micromus vinaceus, sp. n., *id. t. c.* p. 111, Rockhampton.

Chrysopidæ.

DEWITZ, H. Die Angelhaare der Chrysopenlarven. Biol. Centralbl. iv. pp. 722 & 723.

Relates the manner in which the skins of sucked Aphides, &c., are attached.

Variation in neuration in *Chrysopa* ; J. E. Fletcher, Ent. M. M. xxi. p. 258.

Chrysopa stictoneura, sp. n., Gerstæcker, MT. Vorpomm. xvi. p. 103, Rockhampton.

Coniopterygidæ.

LÖW, FRANZ. Beitrag zur Kenntniss der Coniopterygiden. SB. Ak. Wien, xci. pp. 73–89, with plate.

An important memoir in two divisions:—i., Eine neue Coniopterygiden-Larva ; ii., Uebersicht der Gattungen. He first details the structure of a larva found amongst *Coccidæ* on *Pinus mughus*, which produced *C. lutea*, Wallengren, for which the new generic term *Aleuropteryx* (p. 74) is proposed, based on characters of larva and imago; *C. aleurodiformis*, Steph., *psociformis*, Curtis, and *lactea*, Wesm. (*? tineiformis*, Curt.), being retained in *Coniopteryx*. Each species is fully described, and the details well figured. The larvæ of the two genera differ essentially in the form of the mouth parts.

PSEUDO-NEUROPTERA.

KOLBE, H. J. Beitrag zur Kenntniss der *Pseudo-Neuroptera* Algeriens und der Ostpyrenäen. B. E. Z. xxix. pp. 151–157, pl. v.

Brongniart, Bull. Soc. Rouen, 1885, pp. 63–67, in his sub-order (of Neurorthoptères) *Pseudo-Neuroptera* (Carboniferous), divides it into 6 families: (1) *Megasecopterida* (p. 63), comprises insects in some respects analogous to *Perlidæ*, &c. ; in it are placed *Protocapnia*, g. n. (p. 63), without description, *Brodia*, Scud., *Trichaptum* and *Campyloptera*, gg. nn., *ibid.*, without description, *Sphecoptera*, g. n. (*ibid.*), and here *Breyeria* is placed, *Woodwardia*, g. n., p. 64 [*W. nigra*, Brongn., is figured on pl. iv. fig. 1], and *Corydaloides scudderi* and *gracilis* [*C. scudderi* is figured on pl. iv. fig. 3; *cf.* also Bull. Soc. Ent. Fr. (6) v. p. 13, and Le Nat. vii. p. 24]. (2.) *Protodonota* (p. 65), for a g. n. *Protagrion* (p. 65), of which a short indication is given. (3.) *Homothetida*, Scudder, in which are *Hemeristia*, Scud., *Pachytylopsis*, De Borre, *Chrestotes*, Scud., *Omalia*, Coemans, and 3 gg. nn. (p. 66), viz., *Oustaletia*, *Brachyptilus*, and *Diaphanoptera*, indicated without description. (4.) *Protephemerina* (p. 66), for *Homaloneura*, g. n. (*ibid.*), stated to be allied to *Potamanthus*. (5.) *Protoperlida* (*ibid.*), for *Protodiamphipnoa*, *Protokollaria*, *Pictetia*, and

Protoperla, gg. nn. (*ibid.*), all without descriptions. (6) *Protomyrmeleonida* (p. 67), for *Protascalaphus*, g. n. (*ibid.*), without description.

Thysanura.

Ausserer, A. Ueber das massenhafte Auftreten einer Poduride in Aussee Anfangs Marz 1884. MT. Ver. Steierm. 1884 (1885) pp. ciii. & civ.

Concerns a mass of a species of *Achorutes* observed on the snow on a railway embankment at the above-mentioned locality.

Sommer, Albert. Ueber *Macrotoma plumbea*. Beiträge zur Anatomie der Poduriden. Z. wiss. Zool. xli. pp. 683–718, pls. xxxiv. & xxxv. [*Cf.* J. R. Micr. Soc. (2) v. pp. 637 & 638.]

Practically a reprint of the inaugural dissertation noticed in Zool. Rec. xxi. *Ins.* p. 278. Abstr. in Ent. Nachr. xi. pp. 221 & 222.

Lepisma. An undetermined species found amongst account-books in an iron safe in London ; R. Adkin, P. E. Soc. 1885, p. xxiii.

Note on *Thysanura* in coal-mines in Germany ; Ent. Nachr. xi. pp. 317 & 318.

Lipura fimetaria, L., in a cistern and in a well, in the State of New York. Notes and figures ; Lintner, Second Rep. Ins. N. York, pp. 208–210.

Achorutes nivicola, Fitch, appeared in abundance on the snow in the State of New York, in January, 1885. Notes on the insect, and on former appearances, and on allied species, are given, with woodcuts. *Id. t. c.* pp. 203–207.

Dasyleptus, g. n., Brongniart, Bull. Soc. Ent. Fr. (6) v. p. cii. [*cf.* also Le Nat. vii. p. 95]. Allied to *Lepisma* and *Machilis*, but with only one tail. Type, *D. lucasi*, sp. n., *ibid.*, fossil in the Carboniferous of Commentry.

**Lepisma furnorum*, sp. n., Rovelli [*cf.* Zool. Anz. viii. p. 60].

Sminthurus poppei, sp. n., Reuter, Abh. Ver. Brem. ix. p. 214, woodcuts, Bremen.

Mallophaga.

Grosse, F. Beiträge zur Kenntniss der Mallophagen. Z. wiss. Zool. xxiv. pp. 530–557, pl. xviii.

Commences with bibliographical generalities, and proceeds to enter into a minute and critical examination of the internal and buccal anatomy, chiefly derived from a g. & sp. nn., which he terms *Tetrophthalmus chilensis*, on a *Pelecanus* from Chili.

Piaget, E. Les Pédiculines. Essai Monographique. Supplément. Leide : 1885, folio, pp. 161, pls. i.–xvii. [*Cf.* Zool. Rec. xvii. *Ins.* p. 204.]

The introduction (xii. pp.) is principally occupied by a short examination of O. Taschenberg's work [*cf.* Zool. Rec. xx. *Ins.* p. 256], with a

generally favourable critique on that author's emendations, and a list of the synonymic alterations and of the new species therein described. There are further synonymic notes in the body of Piaget's Supplement, which are not here specially recorded. Pl. xvii. is entirely occupied by details of external anatomy. Pp. 140–147 concern *Anoplura*. There are also supplementary figures of known species.

Picaglia, L. Intorno alla divisione del genere *Menopon* nei due sottogeneri, *Menopon* e *Piagetia*. Atti Soc. Mod. (Rendic.) (iii.) ii. pp. 103–107.

The new sub-genus is termed *Piagetia* (p. 104), and includes *M. titan* and *P. ragazii*, sp. n., on *Pelecanus trachyrhincos*, at Callao.

*——. Pediculini nuovi del Museo di Zoologica ed Anatomia comparata della R. Università di Modena. Atti Soc. Ital. xxviii. p. 82 *et seq.*

——. Pediculini dell' Istituto anatomo-zoologico della R. Università di Modena. Atti Soc. Mod. (Mem.) (3) iv. pp. 97–162.

A list of 116 species (including those described in Atti Soc. Ital.), with copious information as to hosts, &c.

New species, &c. :—

Docophorus claviformis, Piaget, *t. c.* p. 2, pl. i. fig. 2, on a *Pitta* from the Philippines; *buphthalmus*, *ibid.* pl. i. fig. 3, on a *Sterna* (adven.?); *extraneus*, p. 3, pl. i. fig. 4, on *Corvus macrorrhynchus*; *limbatus*, p. 4, pl. i. fig. 5, on *Megaloema corvina*; *communis*, N., var. n. *linariæ*, p. 5, pl. i. fig. 6, on *Fringilla linaria*; *æneas*, p. 5, pl. i. fig. 7, on *Motacilla alba*; *subalbicans*, p. 6, pl. i. fig. 8, on *Paradisea papuana*, with varr. on *P. rubra* and *sexpennis*; *setifer*, p. 8, pl. i. fig. 9, on *Epimachus niger*; *5-maculatus*, p. 9, pl. i. fig. 10, on *Hirundo urbica*; *alatoclypeatus*, p. 10, pl. i. fig. 11, on *Dacelo cinereifrons*; *longiclypeatus*, p. 12, pl. ii. fig. 2, on *Sittace macao* (adv.?); *unifasciatus*, p. 13, pl. ii. fig. 3, on *Polyborus vulgaris* (adv.); *elongatus*, p. 15, pl. ii. fig. 4, on *Rhynchops flavirostris*; *virilis*, p. 16, pl. ii. fig. 5, on *Polyborus vulgaris* (adv.?); *bisetosus*, p. 17, pl. ii. fig. 6, on *Mergus serrator*. *D. larinus*, Picaglia, Atti Soc. Ital. p. 82, on a *Larus*; *naviæ*, p. 83, on *Aquila naviæ*; *pustuliferus*, p. 84, on *Hydrochelidon surinamensis*.

Nirmus docophoroides, Piaget, *t. c.* p. 19, pl. ii. fig. 8, on *Tchitrea affinis*; *incertus*, p. 20, pl. ii. fig. 9, on *Totanus glottis* (adv.); *deficiens*, p. 23, pl. iii. fig. 3, on *Cyanopolius cooki*; *semiannulatus*, p. 24, pl. iii. fig. 11, on *Barita leuconota*; *ampullatus*, p. 25, pl. iii. fig. 4, on *Cyanopolius cooki*; *bisetaceus*, p. 27, pl. iii. fig. 6, on *Eurycerus prevostii*; *acuminatus*, *ibid.* pl. iii. fig. 7, on *Ardea egretta*; *erythropteri*, p. 28, pl. iii. fig. 8, on *Merops erythropterus*; *crassipes*, p. 30, pl. iii. fig. 11, on *Thinocorus rumicivorus*; *arcellus*, p. 31, pl. iv. fig. 1, on *Agelastus meleagrides*; *arcus*, p. 32, pl. iv. fig. 2, on *Eurystomus afer*; *goniocotes*, p. 33, pl. iv. fig. 3, on *Dacelo gigas*; *bimaculatus*, p. 148, pl. xvi. fig. 1, on *Barita tibicien*.

Oncophorus latifrons, *id. t. c.* p. 36, pl. iv. fig. 6, on *Buceros semifasciatus*;

flavescens, p. 37, pl. iv. fig. 7, on *Himantornis hæmatopus* ; *cephalotes* var. *major*, p. 149, pl. xvi. fig. 2, on *Buceros nipalensis*.

Gonioctes latifasciatus, *id. t. c.* p. 38, pl. iv. fig. 8, on *Cinclosoma bicolor* ; *candidus*, p. 40, pl. iv. fig. 9, on *Ptilopus cinctus-florensis*, and var. *pellucida*, *ibid.* fig. 10, on *Glyciphila fasciata* ; *laticeps*, p. 41, pl. iv. fig. 11, on *Epimachus albus* ; *quadraticeps*, p. 42, pl. iv. fig. 12, on *Paradisea papuana* ; *coxatus*, p. 43, pl. v. fig. 1, on *Tinamus solitarius* ; *eurygaster*, *ibid.* pl. v. fig. 2, on *Buceros albocristatus* and *Oreoperdix cradigularis* ; *abdominalis* var. *latifasciata*, p. 44, pl. v. fig. 3, on *Agelastus meleagrides* ; *alatus*, p. 45, pl. v. fig. 4, on *Perdix chukar* ; *alatofasciatus*, p. 46, pl. v. fig. 5, on *Rhynchotus rufescens* ; *bifasciatus*, p. 47, pl. v. fig. 6, on *Spheniscus magellanicus* ; *sexsetosus*, p. 48, pl. v. fig. 7, on *Rhynchotus rufescens*.

Goniodes breviantennatus, *id. t. c.* p. 50, pl. v. fig. 8, on *Caccabis chukar* ; *sexpunctatus*, p. 51, pl. v. fig. 9, on *Rhynchotus rufescens* ; *elongatus*, p. 52, pl. v. fig. 10, on *Francolinus capensis* and *Excalfactoria australis* ; *eurygaster*, p. 53, pl. vi. fig. 1, on *Lophophorus impeyanus*.

Lipeurus asymmetricus, *id. t. c.* p. 54, pl. vi. fig. 2, on *Rhea macrorhyncha* and *darwini* ; *pallipes*, p. 56, pl. vi. fig. 3, on *Platycercus splendens* ; *longisetaceus*, p. 57, pl. vi. fig. 4, on *Tinamus solitarius* ; *genitalis*, p. 58, pl. vi. fig. 5, on *Leptoptilus crumenifer* ; *macroceros*, p. 59, pl. vi. fig. 6, on *Milvago pezoporus* ; *nigrolineatus*, p. 60, pl. vi. fig. 7, on *Hemipodius dussumieri* ; *tuberculatus*, p. 61, pl. vi. fig. 8, on *Procellaria glacialis* ; *versicolor* var. *castanea*, p. 62, on *Ciconia leucocephala* ; *capitatus*, p. 63, pl. vi. fig. 9, on *Ibis hagedasch* ; *gambensis*, p. 64, pl. vii. fig. 1, on *Plectropterus gambensis* ; *abnormis*, p. 65, pl. vii. fig. 2, on *Puffinus major* ; *marginellus*, p. 67, pl. vii. fig. 4, on *Bernicla magellanica* ; *acuminatus*, p. 70, pl. vii. fig. 6, on *Excalfactoria australis* ; *fulvus*, *ibid.* pl. vii. fig. 7, on *Imochorus ramicivorus* ; *rubrifasciatus*, p. 71, pl. vii. fig. 8, on *Oreoperdix crudigularis* ; *forcipatus*, p. 72, pl. viii. fig. 1, on *Buceros albocristatus* ; *castaneus*, p. 73, pl. viii. fig. 2, on *Lophophorus impeyanus* ; *antennatus*, p. 75, pl. viii. fig. 3, on *Euplocamus swinhoei* ; *differens*, p. 76, pl. viii. fig. 4, on *Agelastus meleagrides* ; *hamatus*, p. 77, pl. viii. fig. 5, on *Ortyx* sp ? ; *opimus*, p. 78, pl. viii. fig. 6, on *Turacus giganteus* ; *dispar*, p. 79, pl. viii. fig. 7, on *Corythus macrorhynchus* ; *trabeculus*, p. 80, pl. viii. fig. 8, on *Pitta nov-guineæ* ; *albipes*, p. 81, pl. viii. fig. 9, on *Buceros semifasciatus* ; *zonatus*, p. 82, pl. ix. fig. 1, on *Buceros nepalensis* ; *forficula*, p. 83, pl. ix. fig. 2, on *Epimachus albus*. *L. fulvo-fasciatus*, Picaglia, Atti Soc. Ital. p. 85, on *Conurus monacus*.

Trichodectes climax var. *major*, Piaget, *t. c.* p. 86, pl. ix. fig. 5, on *Hircus angorensis* ; *punctum*, p. 87, pl. ix. fig. 6, on *Lamprotornis* sp. ? ; *inæqualemaculatus*, p. 88, pl. ix. fig. 7, on *Auchenia guanaco*.

Menopon pectiniferum, *id. t. c.* p. 90, pl. ix. fig. 8, on *Milvago pezoporus* ; *cingulatum*, p. 91, pl. ix. fig. 9, on *Polyborus vulgaris* ; *crassiceps*, p. 92, pl. x. fig. 1, on *Pulsatrix torquata* ; *elongatum*, p. 93, pl. x. fig. 2, on the same ; *impar*, p. 94, pl. x. fig. 4, on *Psittacus timneh*, var. *scalaris*, p. 95, pl. x. fig. 5, on *Psittacus erithacus* ; *saturatum*, p. 96, pl. x. fig. 6, on *Corvus enca* ; *trithorax*, p. 97, pl. x. fig. 8, on *Corvus macrorhynchus* ; *ovatum* var. *castanea*, p. 97, on the same ; *spiniferum*, *ibid.* pl. x. fig. 9, on *Cyanocorax pileatus* ;

tibiale, p. 100, pl. xi. fig. 1, on *Cyanopolius cooki* ; *tibiale* var. *minor*, p. 101, on *Lamprocolius auratus* ; *crassipes* var. *ovata*, p. 102, on *Paradisea rubra* and *sexpennis* ; *griseum*, *ibid.* pl. x. fig. 3, on *Paradisea papuana* ; *setosum*, p. 103, pl. xi. fig. 4, on *Coccothraustes vulgaris* ; *minusculum*, p. 104, pl. xi. fig. 5, on *Philepitta jula* ; *pullulum*, p. 105, pl. xi. fig. 6, on *Artamia bernieri* ; *infumatum*, p. 106, pl. xi. fig. 7, on *Dacelo gigas* ; *acutovulatum*, *ibid.* pl. xi. fig. 8, on *Buceros malabaricus* ; *brevicolle*, p. 108, pl. xi. fig. 9, on *Thinocorus rumicivorus* ; *merum*, *ibid.* pl. xi. fig. 10, on *Ptilopus fasciatus* ; *subæquale* var. *producta*, p. 109, on *Euplocamus swinhoei* ; *brevipes*, p. 110, pl. xii. fig. 1, on *Crossoptilon mantschuricum* ; *pallipes*, p. 111, pl. xii. fig. 2, on *Excalfactoria australis* ; *cinereum*, *ibid.* pl. xii. fig. 3, on *Himantornis hæmatopus* ; *arctifasciatum*, p. 112, pl. xii. fig. 4, on *Rhynchotus rufescens* ; *mamillatum*, p. 114, pl. xii. fig. 5, on *Theristicus caudatus* ; *planiceps*, p. 115, pl. xii. fig. 6, on *Ardea leucolopha* ; *consanguineum*, p. 116, pl. xii. fig. 7, on *Pelecanus erythrorhynchus* ; *insulsum*, p. 149, pl. xvi. fig. 3, on *Psitta* sp. ? ; *translucidum*, p. 150, pl. xvi. fig. 4, on *Amblyrhamphus holosericeus* ; *tumidum*, p. 151, pl. xvi. fig. 5, on *Plectropterus gambensis* ; *zonatum*, p. 152, pl. xvi. fig. 6, on *Sarcorhamphus gryphus*. *M. biaculeatum*, Picaglia, Atti Soc. Ital. p. 86, on ? ; *sigmoidale*, p. 87, on *Graculus lucidus*.

Ancistrona gigas, Piaget, *t. c.* p. 117, pl. xii. fig. 8, on *Procellaria glacialis*.

Colpocephalum dissimile var. *major*, *id. t. c.* p. 119, on *Haliætus leucogaster* ; *crassiceps*, p. 120, pl. xiii. fig. 3, on *Psittacus timneh* ; *aculeatum*, p. 121, pl. xiii. fig. 4, on *Columba iridotorques* ; *trispinum*, p. 122, pl. xiii. fig. 5, on *Theristicus caudatus* ; *subpenicillatum*, p. 123, pl. xiii. fig. 6, on *Ibis hagedasch* ; *femoratum*, p. 124, pl. xiii. fig. 7, on *Mycteria americana* ; *caudatum* var. *longipes*, p. 125, on *Chunga burmeisteri* ; *abdominale* var. *setosa*, p. 126, pl. xiii. fig. 8, on *Crax carunculata* ; *notatum*, *ibid.* pl. xiii. fig. 9, on *Dichelophus cristatus* ; *latifasciatum*, p. 130, pl. xiv. fig. 2, on *Rhynchops flavirostris* ; *castaneum*, p. 153, pl. xvi. fig. 7, on *Cygnus atratus*. *C. quadriseriatum*, Picaglia, Atti Soc. Ital. p. 89, on *Tadorna cornuta*.

Læmobothrium pallidum, Piaget, *t. c.* p. 132, pl. xiv. fig. 4, on *Ibis olivacea*.

Physostomum maculatum, *id. t. c.* p. 133, pl. xiv. fig. 5, on *Apternus crissoleucus* ; *fasciatum*, p. 134, pl. xiv. fig. 6, on *Larus capistratus*.

Boopia grandis, *id. t. c.* p. 154, pl. xvi. fig. 8, on *Macropus rufus*.

Thysanoptera.

Reuter, O. M. *Thysanoptera* Fennica : i., *Tubulifera*. Bid. Finl. Nat. xl. pp. 1–26.

Enumerates 12 species of *Phlœothrips*, of which the following are new : *P. nigripes*, p. 11, *dentipes*, p. 12, *nodicornis* (= ? *ulmi*, Hal., *nec* F.), p. 16, *similima*, p. 18, *annulipes*, p. 19, *monilicornis*, p. 21, and *apicalis*, p. 25, all from Finland.

Heliothrips hæmorrhoidalis, Bouché. As this insect has been reckoned an enemy of the apple in New York, Pergand thinks it necessary to state that it only wanders on to the trees from other plants; Lintner, Second Rep. Ins. N. York, p. 56.

Termitidæ.

Aloi, A. Sulla compassa delle Termiti nelle vigne di Catania. Atti Acc. Gioen. (3) xviii. pp. 89–94 [*cf.* Grassi, *t. c.* p. 249].

Grassi, B. Intorno ad alcuni protozoi parassati delle Termiti. *T. c.* pp. 235–240.

Kolbe, H. J. Zur Naturgeschichte der Termiten Japans. B. E. Z. xxix. pp. 145–150, pl. vi.

Commences with bibliographical notes on white ants in Japan, after which the nymph and soldier of a species (which the author terms *Termes speratus*, sp. n.) are described in detail; it is supposed to be allied to the N. American *T. flavipes*.

Hagen remarks that, contrary to his former experience, he had found *Termes* (presumably *T. flavipes*) attacking living trees of *Acer rubrum* at Cambridge, Mass., and that, possibly on account of these attacks, the leaves were much smaller than is usual. C. A. Dohrn suggests that the trees were previously unhealthy. S. E. Z. xlvi. p. 61; Canad. Ent. xvii. pp. 134–136.

Termes lucifugus, Rossi, discovered in Hungary; G. Horváth, Rov. Lapok, ii. pp. 208–211 & xxviii.

Infusorial parasites on White Ants in Tasmania described by W. S. Kent, P. R. Soc. Tasm. 1884, pp. 270–273, and Ann. N. H. (5) xv. pp. 450–453.

Embiidæ.

Hagen, H. A. A Monograph of the *Embidina*. Canad. Ent. xvii. pp. 141–155, 171–178, 190–199, & 206–229.

17 species are now known, and are considered in detail, viz.: *Oligotoma cubana*, sp. n., p. 141, Cuba (apterous ♀?, p. 142), a larva had been previously indicated, but not described, as *Olyntha cubana*; *O. hubbardi*, sp. n., p. 142, Florida; *O. insularis*, McLach., p. 143, Hawaiian Is.; *O. saundersii*, Westwood, p. 144, with which *Embia latreillii*, Ramb., is considered identical; *O. michaeli*, McLach., p. 148, treated on at great length; *O. westwoodii*, sp. n., p. 171, in gum copal, probably from Zanzibar; *O. nigra*, sp. n., p. 174, Egypt; *O. antiqua*, Pict. & Hag., p. 176, fossil in Prussian amber; *Embia savignyi*, Westwood, p. 177; *E. mauritanica*, Lucas, p. 190; *E. persica*, McLach., p. 192; *E. solieri*, Ramb., p. 193; *E.* (*Olyntha*) *brasiliensis*, Gray, p. 195; *E.* (*O.*) *batesi*, McLach., p. 195,

with which *brasiliensis*, Burm., *nec* Gray, is considered identical; *E.* (*O.*) *ruficapilla*, Burm., p. 196; *E.* (*O.*) *salvini*, McLach., p. 198; *E.* (*O.*) *mülleri*, sp. n., p. 206, S. Brazil. Pp. 208–212 are occupied by a critical bibliography; pp. 212–222, by an exhaustive consideration of the characters; on p. 222 the different forms and stages are examined, and it is considered that winged females are only known with certainty for *E. mauritanica*, and that a wingless ♀ is probably indicated for *O. michaeli*; on p. 223 the habits are noticed; pp. 223–225 are occupied by distribution; pp. 225–229 relate to systematic position and relation. The author is disposed to retain *Olyntha* (united by McLachlan with *Embia*) as a distinct genus. He maintains that the family is more nearly related to the *Termitidæ* than to any other, but shows affinity to *Psocina*. He rejects any close relationship with *Perlidæ*, especially on account of the condition of the ovaries, and dismisses in few words Wood-Mason's theory that the *Embiidæ* are true *Orthoptera* in a degraded form.

Psocidæ.

Kolbe, H. J. Ein Wort zur systematischen Stellung der Psociden. B. E. Z. xxix. p. 266.

Concerns Brauer's re-classification of insects, and maintains that on certain points the *Psocidæ* are near to *Podurida*, and therefore may form part of Brauer's Order *Apterygogenia*.

——. Die Borneo-Rasse des *Psocus taprobanes*, Hg. Ent. Nachr. xi. pp. 328–330.

Concerns a form found by Grabowski in Borneo, for which the varietal name *flavistigma* is proposed.

Atropos divinatoria appearing in immense numbers in beds in a house in the State of New York; it is suggested that they were, perhaps, introduced in the straw with which the bed-ticks were stuffed: Lintner, Second Rep. Ins. N. York, pp. 198–203, woodcuts.

Elipsocus cyanops, Rostock, in Scotland, and *Cœcilius piceus*, Kolbe, in England; J. J. King, P. N. H. Soc. Glasg. (2) i. p. xix.

New genera:—

Cyrtopsochus, Costa, Bull. Ent. Ital. xvi. p. 243. Apterous, and allied to *Hyperetes*. Type, *C. irroratus*, sp. n., *ibid.*, Sardinia.

Xenopsocus, Kolbe, B. E. Z. xxix. p. 187. *Cœcilinæ*. Type, *X. hageni*, sp. n., *t. c.* p. 188, pl. iv. B, fig. 2, Madagascar.

New species:—

Thylax madagascariensis, Kolbe, B. E. Z. xxix. p. 184, pl. iv. B, fig. 1, Madagascar.

Amphipsocus hildebrandi, *id. t. c.* p. 189, fig. 3, Madagascar.

Cœcilius abjectus and *flavipennis*, Costa, *t. c.* p. 243, Sardinia; *C. amicus*, Kolbe, *t. c.* p. 191, Madagascar.

Psochus funerulus, Costa, *t. c. ibid.*, Sardinia.

Perlidæ.

Perla ochracea, sp. n., Kolbe, B. E. Z. xxix. p. 156, pl. v. fig. 8, Algeria.

Ephemeridæ.

Creutzberg, N. Ueber den Kreislauf der Ephemerenlarven. Zool. Anz. viii. pp. 246–248; translated in Ann. N. H. (5) xv. pp. 494 & 495; abstr., J. R. Micr. Soc. (2) v. p. 637.

Critical as to statements by Verloren. In *Cloëon dipterum* the author finds that the dilatation ("gefässartige Erweiterung") of the circulatory canal in the caudal appendages in the last segment has a direct communication with the dorsal vessel, &c.

Eaton, A. E. A Revisional Monograph of Recent *Ephemeridæ*, or Mayflies. Parts. iii. & iv. Tr. L. S. (2) iii. pp. 153-281, pls. xlvi.–lxiii. [*Cf.* Zool. Rec. xx. *Ins.* p. 263; xxi. p. 280.]

Comprises the fourth series of Group II. of the genera, and three series of Group III. The genera considered are *Baëtis*, *Centroptilum*, *Cloëon*, *Collibætis*, *Coloburus*, *Chirotonetes*, *Metamonius*, *Ameletus*, *Dipteromimus*, *Siphlurus*, *Oniscigaster*, *Bætisca*, *Ametropus*, *Atopopus*, *Thalerosphyrus*, *Epeorus*, *Bleptus*, *Iron*, *Cinygma*, *Rhithrogena*, *Pœgniodes*, *Heptagenia*, *Compsoneuria*, and *Ecdyurus*, with others not named but of which the nymphs are noticed. The plates mostly consist of details of nymphs, &c. Pl. xliv., *Baëtis rhodani*: pl. xlv., a nameless ally of *Centroptilum* (these two published in 1884); pl. xlvi., *Centroptilum luteolum*; pl. xlvii., *Cloëon rufulum*, *simile*, and *dipterum*; pl. xlviii., *Callibætis* sp. ?; pl. xlix. *Chirotonetes* sp. ?; pl. l., *Siphlurus lacustris*, and others doubtful; pl. li., *Oniscigaster wakefieldi*; pl. lii., *Bætisca obesa*; pl. liii., uncertain genus; pl. liv., *Rhithrogena aurantiaca* and *semicolorata*; pl. lv., *Iron* sp. ?; pl. lvi., *Epeorus torrentium*; pls. lvii.–lix., doubtful genera; pl. lx., *Heptagenia gallica*; pl. lxi., *Ecdyurus* sp. ?; pl. lxii., *Ecdyurus*, various species, some undetermined; pl. lxiii., *Hexagenia* (supplementary to pl. xxix.), and details of *Ephemera*. P. 236 is occupied by a table indicating the genera of the *Ecdyurus* type according to tarsal characters.

Great swarms of *Ephemeridæ* on Lough Neagh, Ireland; W. F. Johnson, Ent. M. M. xxii. p. 165.

Cloë unicolor, Hag., renamed *Baëtis hageni*; Eaton, *t. c.* p. 169.

Baëtis tessellata, Hag., renamed *Callibætis hageni*; *id. t. c.* p. 192.

Heptagenia brunnea, Hag., p., renamed *Siphlurus occidentalis*; *id. t. c.* p. 218.

Baëtis fusca, Walk., renamed *Rhithrogena jejuna*; Eaton, *t. c.* p. 252. *B. debilis*, Walsh, renamed *R. manifesta*; *id. t. c.* p. 253. *Hept. brunnea*, Hag., p., renamed *hageni*; *id. ibid.*

New genera :—

Metamonius, Eaton, *t. c.* p. 208. An ally of *Siphlurus*. Type, *M. anceps*, sp. n., p. 209, Chili.

Ameletus, *id. t. c.* p. 210. An ally of *Siphlurus*. Types, *A. dissitus*, p. 210, pl. lxiv., California, *subnotatus*, p. 211, pls. xviii. & xlix., Colorado, and *exquisitus*, p. 212, pl. lxiv., Washington Territory and Oregon spp. nn.

Bleptus, *id. t. c.* p. 243. An ally of *Ecdyurus*. Type, *B. fasciatus*, sp. n., p. 243, Japan.

Iron (indicated, but not described, in 1884), *id. t. c.* p. 244. An ally of *Epeorus*. Types, *I. longimanus*, p. 245, Colorado, *nitidus*, p. 246, Oregon and California, spp. nn.

Cinygma, *id. t. c.* p. 247. Close to *Iron*. Types, *C. integrum*, p. 248, Washington Territory, &c., *par*, p. 249, Arizona, *minus*, *ibid.*, Colorado, *geminatum*, p. 250, Colorado, &c.

New species :—

Baëtis venustula, Eaton, *t. c.* p. 160, Switzerland, *bocagii*, p. 162, Portugal, *gemellus*, p. 163, Switzerland, N. Italy, Savoy, *salvini*, p. 170, pl. xvi., Costa Rica, *feminalis*, p. 171, Ceylon.

Centroptilum lacustre, *id. t. c.* p. 176, Lago Maggiore, *nemorale*, p. 177, Central Italy, *pulchrum*, *ibid.*, France, *poeyi*, p. 179, Cuba.

Cloëon bimaculatum, *id. t. c.* p. 182, pl. xvii., Ceylon, *concinnum*, p. 187, Portugal; *C. viride*, Schneider, Z. Ent. Bresl. (2) x. p. 29, Breslau.

Callibaëtis montanus, Eaton, *t. c.* p. 196, Central America.

Chirotonetes intermedius, *id. t. c.* p. 207, Arizona.

Siphlurus mirus, *id. t. c.* p. 221, New Hampshire, *typicus*, p. 222, Massachusetts.

Epeorus geminus, *id. t. c.* p. 238, Portugal, *assimilis*, p. 239, France, Belgium, and Baden, *psi*, p. 242, Himalaya.

Rithrogena elegantula, p. 253, Colorado and Arizona, *alpestris*, p. 255, pl. xxiv., Alps of Europe, *hybrida*, p. 256, Savoy, *germanica*, p. 260, pl. xxiv., the Rhine.

Heptagenia gallica, p. 272, pls. xxiii., xxiv., & lx., Holland and France.

Odonata.

Roster, D. A. Contributo all' anatomia ed alla biologia degli Odonati. Bull. Ent. Ital. xvi. pp. 256–268, pls. iii. & iv.

Principally concerns the branchial and tracheal systems of *Æschna cyanea*.

Todd, J. E. Notes on the Breeding Habits of the *Libellulidæ*. Am. Nat. xix. pp. 306 & 307. [*Cf.* Ent. Am. i. pp. 16–18.]

In Dakota, the females of a species of *Lestes* descended the stems of water-plants for oviposition, and remained beneath the surface to a depth of several feet for fully half an hour. On reappearing, the female was seized by the male and towed ashore. The copulatory act is detailed for *Lestes*. A species of *Æschna* was seen to dash against the water, apparently for a bath, or for freeing itself from parasites.

In Sumatra, the butterfly *Leptocircus virescens* mimics dragon-flies in company with which it is found; H. O. Forbes, A Naturalist's Wanderings in Sumatra (*cf.* Am. Nat. xix. p. 893).

A few species taken by Quedenfeldt in Algeria are noticed by Kolbe, B. E. Z. xxix. p. 152.

Destruction of fish by Dragon-fly larvæ; Biró's note [*cf.* Zool. Rec. xxi. *Ins.* p. 282], translated in Ent. M. M. xxi. p. 234.

Libellulina.

Libellula quadrimaculata, L. A migratory swarm seen at The Hague, on July 10th, 1884; Van Hasselt, Tijdschr. Ent. xxviii., Verslag, p. xii., and Ritsema, *t. c.* p. xxi.

Corduliina.

Cordulia arctica, Zett., in the Schwarzwald; McLachlan, Ent. M. M. xxii. p. 93.

Æschnina.

Æschna mixta, Latr.: a migratory swarm observed on the banks of the Gironde, in France; F. M. Campbell, Ent. M. M. xxi. p. 192. *Æ. verticalis* (?) entering the water for purposes of oviposition; W. T. Davis, Ent. Am. i. p. 18.

Anax tumorifer, sp. n., McLachlan, Ent. M. M. xxi. p. 250, Madagascar.

Gomphina.

Hagen, H. A. Monograph of the Earlier Stages of the *Odonata*. Subfamilies *Gomphina* and *Cordulegastrina*. Tr. Am. Ent. Soc. xii. pp. 249–291.

Supplementary to Cabot's Monograph [*cf.* Zool. Rec. ix. p. 393], with much additional information. At pp. 286 & 287 the author deals with the question of the separation of the two groups, which he maintains are of equal value, the nymphs of the *Cordulegastrina* being especially remarkable for the form of the mask, and for the tarsi of all being tri-articulate. Short prefatory generalities are given. The species noticed are *Onychogomphus lineatus*, Selys, and one doubtfully of the genus from the Himalayas; *Herpetogomphus menetriisii*, Selys (?), and *compositus*,

Hag. (?); *Ophiogomphus colubrinus*, Selys, *carolinus*, Hag. (?), *severus* and *occidentis*, Hag., and a doubtful species from the Himalayas; *Gomphus vulgatissimus*, L., *adelphus*, Selys (?), *exilis*, Hag., *graslinellus*, Walsh (?), *vastus*, Walsh, *pallidus*, Rbr., *plagiatus*, Selys, *notatus*, Selys, *spiniceps*, Walsh, *olivaceus*, Selys (?), and others not noticed by name; *Cyclogomphus* sp. ?, from the Himalayas; *Epigomphus paludosus*, Selys (?); *Progomphus obscurus*, Selys (?), and two others; *Gomphoides*, two species not determined; *Aphylla producta*, Selys (?); *Hagenius brevistylus*, Selys, *japonicus* and *nanus*, Selys (?); *Uropetala thoreyi*, Selys (?); *Ictinus præcox*, *pugnax*, and another, all doubtful; *Cordulegaster bidentatus*, Selys, and *annulatus*, Latr., *dorsalis*, *diastatops*, and *obliquus*, Selys, doubtful.

Gomphus excelsus, Costa, = *Onychogomphus genei*, Selys; Selys, C.R. ent. Belg. xxix. p. cxlvi.

Onychogomphus costæ (= *genei*, Selys, ♂, olim.), Oran, and *atratus*, Congo, spp. nn., *id. ibid.*

Ophiogomphus [*sic*!] *forcipatus*, L., varr. nn. *consobrinus* and *socialis*, Kolbe, B. E. Z. p. 152, pl. v. figs. 3 & 4, Algeria.

Calopterygina.

Calopteryx hæmorrhoidalis var. *meridionalis*, Selys, noticed from Figueras in the Eastern Pyrenees; Kolbe, B. E. Z. xxix. p. 151.

Agrionina.

Selys-Longchamps, E. de. Programme d'une Révision des Agrionines. C.R. ent. Belg. xxix. pp. cxli.–cxlvi.

Concerns the Légions *Pseudostigma*, *Podagrion*, *Platycnemis*, and *Protoneura*; the author's previous sequential arrangement is modified by the Légion *Lestes* being placed at the end, after *Agrion*. A tabular enumeration of genera and subgenera is given. 181 species are now known for the four Légions, as against 99 in 1865.

Agrion mercuriale ovipositing in mud (in Savoy), and the abdomen becoming thereby incrusted; McLachlan, Ent. M. M. xxi. p. 211. *A. civile* has a similar habit in America; Aaron, Ent. Am. i. p. 16. *A. exulans* descends beneath the surface for oviposition; *id. ibid.*

New genera and subgenera :—

Megapodagrion, Selys, *t. c.* p. cxliv. (= *Podagrion*, Selys, preoccupied).

Heteropodagrion, *id. ibid.* (g. & subg. n.). Type, *H. sanguinipes*, sp. n., *ibid.*, Ecuador.

Mesagrion (subg. of *Heteropodagrion*), *id. ibid.* Type, *M. leucorrhinum*, sp. n., *ibid.*, Bogota.

Protosticta (subg. of *Platysticta*), *id. t. c.* p. clxv. Type, *P. simplicinervis*, sp. n., *ibid.*, Celebes.

Isosticta (subg. of *Alloneura*), *id. ibid.* Type, *I. spinipes*, sp. n., *ibid.*, New Caledonia.

New species :—

Neurolestes trinervis, Selys, *t. c.* p. exliv., Cameroons.

Platycnemis algira, Kolbe, B. E. Z. xxix. p. 153, pl. v. fig. 5, Algeria, with synonymic notes on *P. acutipennis*, Selys.

Ischnura lamellata, *id. t. c.* p. 155, pl. v. fig. 7, Algeria.

ORTHOPTERA.

BY

ROBERT MCLACHLAN, F.R.S., F.L.S., &c.

THE GENERAL SUBJECT.

BONNET, E., & FINOT, A. Les Orthoptères de la Régence de Tunis. Rev. Montp. (3) iv. pp. 193–232 & 333–365, pls. vii. & xvi.

A full list, with details and often descriptions, of 102 species collected in 1883–84, as follows :—7 *Forficulidæ*, 8 *Blattidæ*, 11 *Mantidæ*, 2 *Phasmidæ*, 45 *Acrydiidæ*, 14 *Locustidæ*, and 15 *Gryllidæ* (a few additional species are mentioned at p. 366) ; a geographical analysis is given ; eight-tenths of the species are known from Algeria. Diagnoses of the spp. nn. have (with one exception) already appeared, but there are here detailed descriptions, and in most cases figures also.

BORMANS, A. DE. Materiali per lo studio della Fauna Tunisina raccolti da G. e L. Doria. VII. Orthoptères. Ann. Mus. Genov. (2) ii. pp. 97–115.

A list of 53 species, viz. :—5 *Forficulidæ*, 3 *Blattidæ*, 4 *Mantidæ*, 1 *Phasmidæ*, 25 *Acrydiidæ*, 5 *Locustidæ*, and 10 *Gryllidæ*, with notes, &c.

——. Orthoptères récoltés par M. Weyers à Sumatra (énumeration préliminaire). C.R. ent. Belg. xxix. p. xxiv.

A list of names, with localities.

BRUNER, L. Contributions to the North Trans-Continental Survey. *Orthoptera*. Canad. Ent. xvii. pp. 9–19.

Concerns *Acrydiidæ* and *Gryllidæ* collected by Hagen and Henshaw along the line of the Northern Pacific Railway in 1882.

BUCCHICH, G. Gli Ortotteri di Lesina e Curzola, con alcune notizie biologiche che li risguardano. Verh. z.-b. Wien, xxxv. pp. 377–382.

Enumerates 6 *Forficulidæ*, 7 *Blattidæ*, 4 *Mantidæ*, 1 *Phasmidæ*, 17 *Acrydiidæ*, 20 *Locustidæ*, 8 *Gryllidæ*, with localities and notes on the more interesting species.

A. de Bormans notes that the *Orthoptera* collected by De Selys Fanson (*cf.* Ann. Ent. Belg. xxv. p. 20) were from Delagoa Bay, and not from Transvaal ; C.R. ent. Belg. xxix. p. lx.

A list of 9 species from "Pisola de S. Pietro" is given by Carlini in Bull. Ent. Ital. xvi. p. 195.

A list of species, in all families, taken in the province of Gerona (Catalonia), is given by Cuni y Martorell in An. Soc. Esp. xiv. p. 63.

Brauer (*cf. ante*, p. 6) considers the *Forficulidæ* to represent a distinct Order (*Dermaptera*). Under "*Orthoptera-genuina*" he has two groups, viz.:—(1) "*Mononeura*," which includes *Embidæ* (with doubt), *Blattidæ*, and *Mantidæ*, and (2) "*Heteroneura*," in which are placed *Phasmidæ* and the saltatorial families.

Forficulidæ.

Pygidicrana finschi, sp. n. (= *P. marmoricrura*, Dubrony, *nec* Serv.) ; Karsch, Ent. Nachr. xi. p. 322, North Australia.

Echinosoma insulanum, sp. n., *id. t. c.* p. 323, Madagascar.

Blattidæ.

Goss, H. On the Recent Discovery of the Wing of a Cockroach in Rocks belonging to the Silurian Period. Ent. M. M. xxi. pp. 199 & 200.

An annotated notice of Brongniart's paper [*cf.* Zool. Rec. xxi. *Ins.* p. 287] on *Palæoblattina douvillei* ; translated in S. E. Z. xlvi. pp. 134 & 135.

Scudder, S. H. New Genera and Species of Fossil Cockroaches from the older-American Rocks. P. Ac. Philad. 1885, pp. 34–39. [Reprinted in Ann. N. H. (5) xv. pp. 408–414.]

——. Notes on Mesozoic Cockroaches. *T. c.* pp. 105–115. [Reprinted in Ann. N. H. (5) xvi. pp. 54–64.]

Divided into three parts:—i., *Pterinoblattina*, a remarkable type of *Palæoblattariæ* ; ii., Triassic *Blattariæ* from Colorado ; iii., On the genera hitherto proposed for Mesozoic *Blattariæ*, in which *Blattidium*, Westw., *Elisama*, Giebel, *Rithma*, Giebel, and *Mesoblattina*, Geinitz, are considered (in the latter should be placed *R. murchisoni* and *antiqua*, Giebel)

New genera :—

Promylacris, Scudder, *t. c.* p. 34. For *P. ovale*, sp. n., *ibid.*, fossil in Carboniferous of Illinois.

Paromylacris, *id. t. c.* p. 35. For *P. rotundum*, sp. n., *ibid.*, from same rocks.

Spiloblattina, *id. t. c.* p. 35. For *S. gardineri*, *triassica*, *guttata* (p. 36), and *marginata* (p. 37), spp. nn., from the Triassic of Colorado.

Poroblattina, *id. t. c.* p. 38. For *P. arcuata* and *lakesii*, spp. nn., p. 39, from the Triassic of Colorado.

Pterinoblattina, *id. t. c.* p. 105, formed for *Blatta pluma*, Gieb., *Blattina chrysea*, Gein., *Ricania hospes*, Germ., *R. gigas*, Weyenb., and 2 spp. nn., viz.:— *P. intermixta*, p. 107, Upper Lias of England, and *P. penna*, p. 106, Dorset Purbecks of England.

Neorthroblattina, *id. t. c.* p. 108, formed for *N. albolineata*, *lakesii*, and *rotundata*, p. 109, and *attenuata*, p. 110, spp. nn., from the Triassic of Colorado.

Scutinoblattina, *id. t. c.* p. 110, formed for *S. brongniarti*, p. 110, and *intermedia* and *recta*, p. 111, from the Triassic of Colorado.

Megablattina, Brongniart, Bull. Soc. Rouen, 1885, p. 58. For *Fulgorina kliveri*, Gold.

New species:—

Aphlebia cazurroi, Bolivar, Le Nat. vii. p. 166, Morocco.

Oryctoblattina occidua, Scudder, *t. c.* p. 37, fossil in Carboniferous of Illinois.

Petrablattina aqua and *meieri*, *id. t. c.* p. 38, fossil in Triassic of Colorado.

Mantidæ.

Egg-sacs; E. A. Butler, P. E. Soc. 1885, p. iii., and T. R. Billups, p. xix.

Discothera tunetana, Finot & Bonnet, fully described and figured; *id.* Rev. Montp. (3) iv. pp. 202–210, pl. vii. figs. 1–6.

Phasmatidæ.

Scudder, S. H. *Dictyoneura* and the Allied Insects of the Carboniferous Epoch. P. Am. Ac. 1885, pp. 167–173.

The author refers these fossils to the "ancient *Phasmida*," and states that most of the supposed *Termitidæ* from the European coal-measures really belong here. The following are included, viz.:—*Titanophasma*, Brongn., in which are *T. fayoli*, Brongn., *Dict. libelluloides*, Gold., and *T. jucunda*, sp. n., p. 169, Pennsylvania; *Litoneura*, g. n., p. 169, for *Termes laxa*, Gold., and *D. obsoleta* and *anthracophila*, Gold.; *Dictyoneura*, Gold., retained for *D. schmitzii* and *humboldtiana*, Gold., *D. sinuosa*, Kliv., and *Termes affinis*, Gold.; *Polioptenus*, g. n., p. 170, for *D. elegans*, Gold.; *Protophasma dumasi*, Brongn.; *Breyeria*, De Borre, in which are *B. borinensis*, Borre, and *D. elongata*, Gold.; *Goldenbergia*, g. n., p. 171, includes *D. elongata*, Gold. (but *vide Breyeria*!), *D. nigra*, Kliv., *Termes decheni*, *heeri*, and *formosa*, Gold.; *Haplophlebium*, Scud., for *H. barnesii*, Scud., and *longipennis*, sp. n., p. 172, Pennsylvania; *Paolia*, Smith, for

P. vetusta, Smith, and the following spp. nn., viz., *P. superba*, Mazon Creek, *laocana*, Pennsylvania, and *gurleyi*, Indiana, p. 173.

Under this heading the Recorder proposes to notice the Carboniferous fossils placed by Brongniart (Bull. Soc. Rouen, 1885, pp. 59–63) in his Order "Neurorthoptères," which he divides into two sub-orders, "*Neurorthoptera*" proper, and *Palæodictyoptera*, Gold. In the first are two families, viz. : — *Protophasmida*, in which are *Protophasma*, Brongn. (*P. gaudryi*, Brongn., is figured on pl. ii. fig. 1), *Lithophasma*, g. n., p. 59, for *Gryllacris lithantraca*, Gold., *Titanophasma*, Brongn., and *Archæogryllus*, Scud. The second family is termed *Sthenaropterida* (p. 60), and includes *Meganeura*, g. n. (p. 60), for *Dictyoneura monyi*, Brongn., *Archæoptilus*, Scud., and *Megathentomum*, Gold. The second sub-order comprises three families, viz. :—*Stenodictyopterida* (p. 60), in which are *Eugereon*, also *Scudderia*, Brongn., *Megaptilus*, g. n. (p. 61), *Haplophlebium* and *Goldenbergia*, Scud., and *Dictyoneura*, Gold. ; the second family is termed *Hadrobrachypoda* (p. 62), and comprises *Miamia*, Scud., and *Leptoneura*, g. n. (p. 62), in which are placed 4 species indicated by name (*L. oustaleti*, Brongn., is figured on pl. v. fig. 4) ; the third family is termed *Platypterida* (p. 62), and contains *Lamproptilia*, g. n. (p. 63), for 3 species (*L. grandeuryi*, Brongn., is figured on pl. iii. fig. 1), *Zeilleria*, g. n. (*ibid.*), for 3 species (*Z. fusca*, Brongn., is figured on pl. v. fig. 2), and *Spilaptera*, g. n (*ibid.*, *S. packardi*, Brongn., is figured on pl. v. fig. 1).

Bacillus coloreus, Colenso, Tr. N Z. Inst. xvii. p. 151, *filiformis* and *minimus*, p. 153, *atro-articulus*, p. 154, New Zealand, spp. nn.

Gryllidæ.

Korotneff, A. Die Embryologie der *Gryllotalpa*. Z. wiss. Zool. xli. pp. 570–604, pls. xxix.–xxxi.

Almost purely embryological and physiological ; the eggs are laid at intervals.

4 species of *Gryllus* (mostly undetermined) and an undetermined *Œanthus* are noticed by Bruner from the N. Pacific Railway ; Canad. Ent. xvii. pp. 18 & 19.

Homaloblemmus olcesii, sp. n., Bolivar, Le Nat. vii. p. 117, Tangiers.

Gryllomorphus fragosoi, sp. n., *id. ibid.*, Seville.

Gryllodes littoreus, sp. n., *id. t. c.* p. 174, Spain.

Locustidæ.

Copiophora cornuta (?) found living in hot-houses near Birmingham ; McLachlan, P. E. Soc. 1885, p. xxvii., and Shaw, p. xxxiii.

Onconotus servillei, Fisch. E. Vángel, Rov. Lapok, ii. p. 18 & p. ii., says that, having a pair of this species, the ♀ devoured the ♂ while they were in copulâ. [*Cf.* Ent. M. M. xxii. p. 40.]

A few species (determined only generically) from the N. Pacific Railway are noticed by Bruner, in Canad. Ent. xvii. p. 19.

Ephippiger oudryanus, Finot & Bonnet, fully described and figured; Bonnet & Finot, Rev. Montp. (3) iv. pp. 351–356, pl. vii. figs. 1–7.

New species :—

Ephippigera pellucida, Bolivar, Le Nat. vii. p. 116, and *serrata*, p. 117, Portugal; *E. innocentii*, Finot & Bonnet, Rev. Montp. (3) iv. p. 345, pl. xvi. figs. 8–13, Tunis.

Platycleis umbilicata, Costa, Bull. Ent. Ital. xvi. p. 242, Sardinia.

Deinacrida armiger, Colenso, Tr. N. Z. Inst. xvii. p. 155, New Zealand.

Eugaster bloyeti, Lucas, Bull. Soc. Ent. Fr. (6) v. p. xci., Kondoa, E. Africa.

ACRYDIIDÆ.

Acrydium peregrinum in immense swarms at Caracas; A. Ernst, Ent. Nachr. xi. p. 7.

Destruction occasioned by "Locusts" (probably *Acrydium americanum*) in Mexico and Central America; A. S. Packard, Am. Nat. xix. pp. 1105 & 1106.

Chimarocephala viridifasciata, De Geer, appearing in numbers in mid-winter in the State of New York, but not considered to be a cause for alarm; Lintner, Second Rep. Ins. N. York, pp. 187–198, with numerous woodcuts of it and other injurious species.

A list of about 40 species (some new, some unnamed), collected by Hagen & Henshaw along the line of the N. Pacific Railway in 1882, is given by L. Bruner, in Canad. Ent. xvii. pp. 10–18.

Bolivar's "Pirgomorfinos" [*cf.* Zool. Rec. xxi. *Ins.* p. 292] reviewed by Finot, Le Nat. vii. p. 46.

Finotia spinicollis, Bonnet, fully described and figured; Bonnet & Finot, Rev. Montp. (3) iv. pp. 333–340, pl. xvi. figs. 1–7.

Dericorys millieri, Finot, fully described and figured; *iid. t. c.* pp. 223–230, pl. vii. figs. 7–14.

Stenobothrus lucasi, Brisout, redescribed and figured; Bormans, Ann. Mus. Genov. (2) ii. pp. 105–107.

Brongniart, Bull. Soc. Rouen, 1885, institutes the family *Palæacridioidea*, and places therein the following Carboniferous fossils, mostly from Commentry, viz.: *Œdischia*, g. n., p. 58, type figured as *Œ. williamsonii*, pl. i. fig. 3; *Sthenaropoda*, g. n., p. 59, type figured as *S. fischeri*, pl. i. fig. 4; *Protogryllacris*, g. n., *ibid.*; *Sthenarocera*, g. n., *ibid.*, type figured as *S. pachytyloides*, pl. i. figs. 1 & 2; *Caloneura*, g. n., *ibid.* Here also he places *Macrophlebium hollebeni*, Gold.

New species :—

Trimerotropis cæruleipennis, Bruner, Canad. Ent. xvii. p. 10, N. Pacific Railway, Montana, Idaho, Wyoming, Utah.

Pezotettix hispidus, Bruner, *t. c.* p. 12, and *washingianus*, p. 14, Washington Territory.

Bradynotes montanus, *id. t. c.* p. 16, Washington Territory and Montana.

Duronia laurœ, sp. n., Bormans, Ann. Mus. Genov. (2) ii. p. 103, fig., Tunis.

Helioscirtus finotianus, Saussure, Le Nat. vii. p. 28, Algeria. (Amended characters are given for the genus.)

Stenobothrus bonneti, Bolivar, Le Nat. vii. p. 116, Tunis.

ECHINODERMATA.

BY

F. Jeffrey Bell, M.A., Sec. R.M.S.

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52. Wachsmuth, C., & Springer, F. Revision of the *Palæocrinoidea*. Part III. Discussion of the Classifications and Relations of the Brachiate Crinoids, and Conclusion of the Generic Descriptions. P. Ac. Philad. 1885, pp. 225–364, pls. iv.–ix.

53. Walter, A. Ceylons Echinodermen. Jen. Z. Nat. xviii. pp. 365–384.

Geographical Distribution.

Echinoderms collected during the expedition to Point Barrow, Alaska; Report, Washington, 1885, pp. 156–162: of Shetland Islands; Pearcey, P. R. Phys. Soc. 1884–5, pp. 404 & 405: Coast of Netherlands; Horst, Tijdschr. Nederl. Dierk. Ver. (2) i. pp. 69–76: of Channel Islands; Koehler, Bull. Soc. Nancy (2) xviii. pp. 74–76: West Coast of France; Barrois (2): of Beaufort, U.S.A.; Nachtrieb (35): of Italy; Camerano & Lessona, Compendio della Fauna italica (Torino, 1885), pp. 297–300: of the Adriatic; Stossich, Boll. Soc. Adr. viii. pp. 90–110: of Ceylon; Walter (53): of Campbell Island; Filhol, Rec. Vénus, iii. (2) pp. 572 & 573.

Asteroids and Ophiuroids of South Georgia; Studer (51).

Asteroids of Mediterranean, Red Sea, and N. Atlantic; Perrier (39, 40, 41): of Mauritius; de Loriol (29).

Echinoids of Gulf of Mexico; Rathbun (48): of Japan; Döderlein (11).

Geographical and Bathymetrical Distribution of *Crinoidea*; P. H. Carpenter, Rep. Brit. Ass. 1884 (1885) pp. 758–760.

Echinoderms in relation to American Fisheries; Rathbun, Fishery Industries of the United States. Section I. (Washington: 1884, 4to) pp. 838–841, pl. cclxxvii.

Colouration of Echinoderms; Camerano, Mem. Acc. Tor. xxxvi. p. 343.

Phosphorescence of do.; McIntosh, Nature, xxxii. p. 478.

Larvæ of do.; Conn, Stud. Biol. Lab. J. Hopkins Univ. iii. pp. 188–191.

A general account of Echinoderms is given by Lockington, in the Standard Natural History (Boston: 1885, 4to, ed. Kingsley) i. pp. 135–184.

General Morphology.

Carpenter (3) and Koehler (26) continue to discuss the characters of the vascular system; the former (5), Perrier (38, 42), Wachsmuth & Springer (52) have contributed to the morphology of the *Crinoidea*.

Haacke (20, 21) describes some quadriradiate specimens of *Amblypneustes*, and raises the question of the primitive pentamerism of the *Echinodermata*.

Nachtrieb's note (35) contains some suggestions on the phylogeny of the *Echinodermata*.

Hamann (22) has made important contributions to the histology of Asteroids and Holothuroids; the Sarasins (50) describe the eyes on the test of *Diadema*; Niemiec and Perrier (36, 37) discuss the suckers; and

MacMunn (32) contributes to the knowledge of the colouring matter echinochrome.

O. and R. Hertwig have made the ova and spermatozoa of various European Echinids the basis of experimental inquiries into "die Bedingungen der Bastardbefruchtung"; Jen. Z. Nat. xix. pp. 121–165, and Suppl. i. pp. 72–76.

R. Hertwig has used the ova of Echinids to criticise Pflüger's theory of the influence of gravity on cell-division; *t. c.* Suppl. pp. 70–72.

ECHINOIDEA.

Notice of *Echinoidea* of 'Challenger' Expedition; Agassiz, Chall. Nar. i. pp. 197–201.

On the value of Pomel's (41) generic and subgeneric divisions, see Gauthier (17).

Prouho (46) finds that the pluteus of *Dorocidaris* has the lobes greatly developed.

Ayres (1) describes the sphæridia, and discusses the results of Lovén.

Duncan (12, 13) adds to our knowledge of the structure of the ambulacra.

Ramsay (47) has notes on some of the Australian species, and figures:—
Phyllacanthus australis, sp. n., Port Jackson, p. 44.
Salmacis woodsi, sp. n., Port Jackson ?, p. 47.
Echinocardium australe has been met with in water which at certain seasons of the year must at least become brackish; p. 53.

Goniocidaris tubaria described and figured; M'Coy, Prodr. Zool. Vict. x. pp. 33–35, pl. c.

On *Cœlopleurus* and *Arbacia*; see Duncan & Sladen (16).

Cœlopleurus maillardi, "tag" of; Duncan, Ann. N. H. (5) xvi. pp. 88 & 89.

Döderlein (11) describes as new:—
Dorocidaris japonica, p. 76, *grandis*, p. 77, ? *gracilis*, p. 78;
Stephanocidaris biserialis, p. 79, *Discocidaris mikado*, p. 80;
Goniocidaris clypeata, p. 82;
Salenia pacifica, p. 84;
Pleurechinus variabilis, p. 90, *ruber*, p. 92;
Salmacopsis, g. n., for *S. olivacea*, p. 93; *Salmacis lactea*, p. 94;
Hemipedina mirabilis, p. 96;
Echinus lucidus, p. 97;
Toxopneustes elegans, p. 99;
Clypeaster clypeus, japonicus, p. 100, *excelsior*, p. 101, *virescens*, p. 102;
Laganum fudsyama, *Peronella pellucida*, p. 104, *rubra* ?, p. 106;
Brissus agassizi, p. 108.
And has notes on:—
Cidaris metularia, *Phyllacanthus verticillatus*, *Diadema setosum*, *Echinometra lucunter*, *Strongylocentrotus depressus*, *Sphærechinus pulcherrimus*, *Temnopleurus toreumaticus*, *T. hardwickii*, *T. reynardi*, *Toxopneustes pile-*

olus, *Peronella decagonalis*, *Pourtalesia laguncula*, *Palæostoma mirabile*, and *Metalia maculosa*.

In all 47 species are enumerated.

Lepidopleurus, g. n. (Temnopleurid) ; Duncan & Sladen (15), p. 306.

Galerites ; see Duncan, Geol. Mag. (3) ii. pp. 492–494.

Echinocardium ; see Cotteau (7), pp. 559–563.

Hemiaster : systematic position ; Duncan, Ann. N. H. (5) xv. p. 72.

Cotteau, C.R. c. pp. 1515 & 1516, finds that of the 50 genera of Jurassic Echinids, only 4 are found in tertiary and only 2 in recent times. In Pal. Fr. livr. 73 & 75, he continues his account of Jurassic Echinids.

ASTEROIDEA.

Preliminary notice of 'Challenger' *Asteroidea* ; Sladen, Chall. Nar. i. pp. 607–617.

De Loriol (29) describes :—

Asterias calamaria, p. 4 ;

Acanthaster mauritiensis, sp. n., p. 6 (distinguished from *A. echinites*) ;

Echinaster purpureus, p. 10 ;

Valvaster striatus, p. 11 ;

Mithrodia clavigera, p. 13 ;

Ophidiaster duncani, p. 15, *O. perrieri*, p. 17, spp. nn., *O. cylindricus*, p. 20, *O. purpureus*, p. 22, *O. robillardi*, sp. n., p. 24 ;

Linckia multiforis, p. 27, *L. ehrenbergi*, p. 31, *L. marmorata*, p. 35, *L. miliaris*, *L. pacifica*, p. 36 ;

Leiaster coriaceus, p. 37, *L. leachi*, p. 40 ;

Scytaster variolatus, p. 43 ;

Fromia milleporella, p. 44 ;

Ferdina flavescens, p. 47 ;

Goniodiscus sebæ, p. 48, *G. studeri*, sp. n., p. 49 ;

Pentagonaster spinulosus, p. 52.

Pentaceros belli, p. 53, *P. sladeni*, p. 57, spp. nn., *P. grayi*, p. 60 ;

Culcita schmideliana, p. 64 ;

Gymnasteria carinifera, p. 67 (*G. biserrata* is probably a synonym) ;

Asterina cephea, p. 69 ;

Luidia savignii, p. 72 ;

Astropecten hemprichii, p. 74, *A. polyacanthus*, p. 76, *A.* sp., p. 77 ;

Archaster angulatus, p. 78.

Perrier (41) describes as new, or gives, for the first time, full descriptions of :—

Brisinga mediterranea, p. 3 ;

Freyella : *F. spinosa*, p. 5, *F. sexradiata*, p. 6, *F. edwardsi*, p. 8 ;

Odinia : *O. semi-coronata*, p. 9, *O. robusta*, p. 11 ;

Coronaster : *C. parfaiti*, p. 14 ;

Zoroaster longicauda, p. 19 ;

Stichaster talismani, p. 22 ;

Cribrella abyssicola, p. 24 ;

Fromia narcissiæ, p. 28 ;

Stephanaster bourgueti, p. 31 ;
Pentagonaster crassus, *deplasi*, *vincenti*, *gosselini*, *grandis*, *hæsitans*, pp. 34–36, *elongatus*, p. 38 ;
Astrogonium fallax, p. 37 ;
Dorigona prehensilis, p 39 ;
Goniopecten subtilis, p. 41.

The *Porcellanasteridæ* are elevated into a family, and the 6 genera which compose it diagnosed, p. 41.

Caulaster pedunculatus, p. 45, *C. sladeni*, p. 47.
Porcellanaster inermis, p. 50, *P. granulosus*, p. 53.
Styracaster spinosus, p. 55, *S. edwardsi*, p. 59.
Hyphalaster antonii, p. 61, *H. parfaiti*, p. 65.
Pseudaster, g. n., for *P. cordifer*, p. 68.

Summary diagnoses are given of the *Pterasteridæ* :—
Myxaster, g. n., for *M. sol* ;
Cryptaster, g. n., for *C. personatus*, p. 69.

And of the *Archasteridæ* :—
Pectinaster, g. n., for *P. insignis* and *P. filholi*, p. 70 ;
Crenaster, g. n., for *C. marionis* and *C. mollis* ;
Goniopecten inermis, p. 71.

The species were collected by the 'Travailleur' and the 'Talisman,' but the localities are incompletely stated.

Studer (51) describes as new :—
Pedicellaster octoradiatus, p. 147, *P. sarsi*, p. 149 ;
Asterias georgiana, p. 150, *A. steineni*, p. 152 ;
Anasterias perrieri, p. 153 ;
Stichaster nutrix, p. 154 ;
Cribrella pagenstecheri, p. 158.

Hymenaster modestus, p. 151 ;
Archaster sepitus, p. 151 ;
Solaster abyssicola, p. 152 : spp. nn., from S. coast of New England. Verrill, Am. J. Sci. (3) xxix.

Astropecten aurantiacus and *A. irregularis* ; Horst, Tijdschr. Nederl. Dierk. Ver. (2) i. pp. 72–75, pl. v.

OPHIUROIDEA.

Notice of 'Challenger' Ophiuroids ; Lyman, Chall. Nar. i. pp. 172–175.

Studer (51) describes as new :—
Ophioceramis antarctica, p. 160 ;
Ophioglypha martensi, p. 161 ;
Amphiura affinis, p. 162, *A. lymani*, p. 163.

Ophiacantha vassidens, p. 152, *O. enopla*, *O. granulifera*, *O. aculeata*, p. 153 ;
Ophiolepis acanella, p. 153 ;
Ophiomitra spinea, p. 154 : spp. nn., from S. coast of New England. Verrill, Am. J. Sci. (3) xxix.

VERMES.

BY

F. JEFFREY BELL, M.A., SEC. R.M.S.

D'A. W. THOMPSON has published (Cambridge : 1885, 8vo) a Bibliography of Protozoa, Sponges, Cœlenterata, and Worms, for the years 1861–83. Worms : General, pp. 142–144; *Mesozoa*, pp. 144 & 145; *Platyhelminthes*, pp. 145–152; *Cestoda*, pp. 152–161; *Trematoda*, pp. 162–168; *Turbellaria*, pp. 168–174; *Nemertina*, pp. 174–177; *Nematoda*, pp. 177–187; *Trichina*, pp. 189–193; *Echinorhynchus*, pp. 193 & 194; *Rotifera*, pp. 194–198; *Gephyrea*, pp. 198–201; *Phoronis*, p. 218; *Discophora*, pp. 231–235; *Chætopoda*, pp. 235–254; *Myzostomea*, p. 254; *Balanoglossus*, pp. 255 & 256; *Chætognatha*, p. 256.

For a general account of *Vermes*, see C. S. MINOT, in the Standard Natural History (Boston : 1885, 4to, ed. Kingsley) i. pp. 185–235.

Colouration of Worms; CAMERANO, Mem. Acc. Tor. xxxii. pp. 343 & 344.

Phosphorescence of do.; MCINTOSH, Nature, xxxii. pp. 478 & 479.

List of *Vermes* collected during the Expedition to Point Barrow, Alaska; Report, Washington, 1885, pp. 152–156.

Worms of the Gulf of Finland; BRAUN, SB. Dorp. vii. p. 141; Arch. Nat. Liv. (2) x. pp. 90–95 & 107–109.

Vermes of Channel Islands; KOEHLER, Bull. Soc. Nancy (2) xviii. pp. 76–82.

Vermes of Italy; L. CAMERANO & M. LESSONA, Compendio della Fauna italica (Torino, &c. : 1885), pp. 289–297.

Lake-fauna of Austria; IMHOF, SB. Ak. Wien, ci. pp. 203–226.

FOREL, F. A. La Faune Profonde des Lacs suisses. N. Denk. schw. Ges. xxix. (*Annulata*, pp. 121–123; *Nematoïds*, pp. 123 & 124; *Platyhelminthes*, pp. 124–128; Rotifers, p. 129).

Marine Worms used for Bait; RATHBUN, Fishery Industries of the United States, Section i. (Washington : 1884, 4to) pp. 831–833, pl. cclxxvi.

PLATYHELMINTHES.

1. Braun, M. Die rhabdocœliden Turbellarien Livlands. Arch. Nat. Liv. x. pp. 131–251, pls. i.–iv. [See also Zool. Anz. viii. pp. 696–699.]

2. Chatin, J. Helminthes de l'île Campbell et de la Nouvelle Zélande. Bull. Soc. Philom. (7) ix. pp. 36–43.

3. Cobbold, T. S. Notes on Parasites collected by the late Charles Darwin, Esq. J. L. S. xix. pp. 174–178.

4. Conn, H. W. Marine Larvæ and their Relation to Adults. Stud. Biol. Lab. J. Hopkins Univ. iii. pp. 165–192, pls. viii. & ix.

5. Cunningham, J. T. On *Stichocotyle nephropis*, a new Trematode. Tr. R. Soc. Edinb. xxxii. pp. 273–279, pl. xxxix. [See Zool. Rec. xxi. *Verm.* p. 5.]

6. Delage, Y. De l'existence d'un système nerveux chez les Planaires acœles et d'un organe des sens nouveau chez la *Convoluta schultzii*. C.R. ci. pp. 256–258 [Ann. N. H. (5) xvi. p. 150].

7. Duplessis-Gouret, G. Notice sur les Monotides d'eau douce (*Monotus morgiensis* et *Monotus relictus*). Zool. Anz. viii. pp. 291–293.

8. Geddes, P. Parasites. Encycl. Brit. xviii. p. 258.

9. Graff, L. Planarians. *Op. cit.* xix. pp. 170–175.

10. Hamann, O. *Tænia lineata*, Goeze, eine Tänie mit flächenständigen Geschlechtsöffnungen. Z. wiss. Zool. xlii. pp. 718–744, pls. xxix. & xxx.

11. Hubrecht, A. A. W. Der excretorische Apparat bei Nemertinen. Zool. Anz. viii. pp. 51–53.

12. ——. Zur Embryologie der Nemertinen. *T. c.* pp. 470–472. [See also Tijdschr. Nederl. Dierk. Ver. (2) i. pp. xlvi.–xlviii.]

13. ——. Proeve eener Ontwikkelingsgeschiedenis van *Lineus obscurus*, Barrois. Utrecht: 1885, 4to, 50 pp., 6 pls. [For account in English by the author, see Q. J. Micr. Sci. xxvi. pp. 417–448, pl. xxii.]

14. Imhof, O. E. Notiz bezüglich der Verbreitung der Turbellarien in der Tiefseefauna der Süsswasserbecken. Zool. Anz. viii. pp. 434 & 435.

15. Lacaze-Duthiers, H. Sur le *Phœnicurus*. C.R. ci. pp. 30–35 [Ann. N. H. (5) xvi. pp. 157–162].

16. Linstow, —. Beobachtungen an bekannten und neuen Nematoden und Trematoden. Arch. f. Nat. li pp. 235–255.

17. Looss, A. Beiträge zur Kenntniss der Trematoden. *Distomum palliatum*, sp. n., und *D. reticulatum*, sp. n. Z. wiss. Zool. xli. pp. 390–446, pl. xxiii.

18. Niemiec, J. Recherches morphologiques sur les ventouses dans le règne animal. Rec. Z. Suisse, ii. (*Cestoda*, pp. 29–38; *Trematoda*, pp. 38–46; *Discophora*, pp. 46–52; *Myzostomida*, pp. 53–56).

19. ——. Sur le système nerveux des Tenias. C.R. c. pp. 385–387.

20. [Niemiec, J.] Sur le système nerveux des Bothryocéphalides. C.R. c. pp. 1013–1015.

21. Örley, L. A Czápáknak és Rájáknak Belférgei (Die Entozoen der Haien und Rochen). Term. füzetek, ix. pp. 97–126 & 216–220.

22. Oudemans, A. C. The Circulatory and Nephridial Apparatus of the *Nemertea*. Q. J. Micr. Sci. suppl. 1885, pp. 1–80, pls. i.–iii.

23. Parona, C. Di alcuni elminti raccolti nel Sudan orientale da A. Beccari e P. Magretti. Ann. Mus. Genov. (2) ii. pp. 424–445, pls. vi. & vii.

24. Pereyaslawzew, S. Sur le développement des Turbellaires. Zool. Anz. viii. pp. 269–271 (additional note by W. Repiachoff, *t. c.* pp. 272 & 273).

25. Poirier, J. Contribution à l'histoire des Trématodes. Arch. Z. expér. (2) iii. pp. 465–624, pls. xxiii.–xxxiv.

26. Prenant, A. Recherches sur les vers parasitaires de Poissons. Bull. Soc. Nancy (2) xviii. pp. 206–230.

27. Salensky, W. Recherches sur le développement du *Monopora vivipara* (*Boriasia vivipara*, Uljan.). Arch. Biol. v. pp. 517–571, pls. xxx.–xxxii.

28. Schauinsland, H. Die embryonale Entwickelung der Bothriocephalen. Jen. Z. Nat. xix. pp. 520–572, pls. vii.–ix.

29. Schwarze, W. Die postembryonale Entwicklung der Trematoden. Z. wiss. Zool. xli. pp. 41–86, pl. iii.

30. Stein, S. T. Die Parasitären Krankheiten des Menschen. i. Entwickelungsgeschichte und Parasitismus der menschlichen Cestoden. Luhr: 1882, fol., 52 pp., 14 pls.

31. Stossich, M. Brani di Elmintologia tergestina. Boll. Soc. Adr. viii. pp. 111–121, 3 pls.

32. Thomas, J. D. Notes upon the Experimental Breeding of *Tænia echinococcus* from the *Echinococci* of Man. P. R. Soc. xxxviii. pp. 449–457.

33. ——. Note upon the Frequent Occurrence of *Tænia echinococcus* in the Domestic Dog in certain parts of Australia. *T. c.* pp. 457 & 458.

34. Wright, R. Ramsay. A Free-swimming Sporocyst. Am. Nat. xix. pp. 310 & 311.

35. Zacharias, O. Studien über die Fauna der Grossen und Kleinen Teiches im Riesengebirge. Z. wiss. Zool. xli. (*Vermes*, p. 496; *Turbellaria*, pp. 496, 497, & 503–510; *Otomesostoma*, pp. 514–516).

36. ——. Das Wassergefässsystem bei *Microstoma lineare*. Zool. Anz. viii. pp. 316–321.

37. ——. Vorläufige Mittheilung über das Ergebnis einer faunistischen Excursion in's Iser-, Riesen-, und Glatzer Gebirge. *T. c.* pp. 575–577 [see also p. 666].

38. Zenker, F. A. Ueber den *Cysticercus racemosus* des Gehirns ; Beiträge zur Anat. u. Embryol. als Festgabe J. Henle, &c. Bonn : 1882, pp. 119–140, pl. xiii.

39. Zschokke, F. Ueber den Bau der Geschlechtswerkzeuge von *Tænia litterata*. Zool. Anz. viii. pp. 380–384.

General Morphology.

Lacaze-Duthiers (15) finds that *Phœnicurus* is acœlomate, and regards it as one of the *Dendrocœla*; but a complete statement of its position must be deferred till its gonads have been investigated.

Delage (6) describes the nervous system of *Convoluta schultzii*, and a sensory organ other than the optic or auditory, which he calls the frontal organ, and regards as having a testing function.

General account of Planarians; Graff (9).

The development of *Lineus obscurus* has been studied by Hubrecht (13); see also (12).

Salensky (27) has investigated that of *Borlasia* (for which he suggests *Monopora*, g. n.) *vivipara*. He compares the nervous system of Nemertines with that of Annelids, and the proboscis and its associated parts with their homologues in the *Rhabdocœla*.

Oudemans (22) recognizes three types of vascular system in the *Nemertinea*, and describes the arrangements of the nephridia.

A short notice of the *Nemertinea* of the 'Challenger' is given by Hubrecht; Chall. Nar. i. pp. 830–832.

Niemiec (19) gives an account of the nervous system of the *Tæniidæ*, based on a study of *T. cœnurus*, *T. elliptica*, *T. serrata*, and *T. mediocanellata*. He recognizes a nerve-ring, from the ganglionic swellings on which eight branches are given off, four of which pass into the proglottids; and he compares his results with those of other observers, and the facts with those seen in Trematodes and Annelids. The nervous system of *Bothriocephalus* (20) is simpler and more primitive.

Hamann (10) and Zschokke (39) contribute to our knowledge of the structure of *Tænia*.

Schauinsland (28) discusses the resemblances of the life-history of the *Bothriocephalidæ* with those of *Tæniidæ* and other Platyhelminthes.

Looss (17) describes the anatomy of *Distomum palliatum* and *D. reticulatum*, spp. nn. He thinks that the *Distomata* will have to be broken up into smaller groups, but does not expect to find any assistance from the number or arrangement of the suckers. Poirier (25) describes the muscular system of *D. clavatum*, regards the canal of Laurer as a kind of safety duct for superabundant genital products, and doubts whether the nervous system of Trematodes always consists of six longitudinal trunks. The structure and development of various *Cercariæ* have been studied by Schwarze (29). Wright (34) describes a free-swimming Sporocyst.

Genera and Species.

Turbellaria of fresh waters; Duplessis-Gourret (7), Imhof (14), Zacharias (35, 37).

Braun (1) describes as new :—

Macrostoma orthostylum, p. 138;

Stenostoma middendorffi, p. 141 ;

Prorhynchus curvistylus, p. 144 ;

Mesostoma chromobactrum, p. 157, *M. platycephalum*, p. 161, *M. rhynchotum*, p. 173, *M. punctatum*, p. 175, *M. nigrirostrum*, p. 179, *M. rangeense*, p. 182, *M. lanceola*, p. 185 ;

Bothromesostoma, g. n., for *B. personatum* (O. S.), p 187, *B. esseni*, p. 194, *B. marginatum*, p. 201, *B. lineatum*, p. 203 ;

Castrada sp. n. an *radiata*, p. 205, *C. acuta*, p. 206, *C. hofmanni*, p. 207, *C. chlorea*, p. 209, *C. granea*, p. 211, *C. pellucida*, p. 213 ;

Vortex penicillus, p. 219 ;

Derostoma balticum, p. 226.

Mesostoma tetragonum, *M. craci*, *M. productum*,

Derostoma megalops,

Automolos morgiensis,

Stenostoma leucops, *S. unicolor*,

Castrada radiata,

are described and figured. There are notes on a few other species also.

Tænia apterycis, Chatin (2), p. 42; *T. linstowi*, sp. n. (intestines of *Numida ptilorhyncha*), p. 427, *T.* sp. n. and *T.* sp., Parrona (23).

Bothriocephalus cestus, sp. n., from a Trout ; Leidy, P. Ac. Philad. 1885, pp. 122 & 123.

Schistocephalus dimorphus ; Braun, SB. Ges. Dorp. vii. p. 175.

Cystic worms in muscles of Hare ; *id. t. c.* p. 191.

Cysticercus pisiformis the cause of venous cirrhosis in a rabbit ; Laulanié, C.R. c. p. 128.

Oxygmatobothrium dohrni (intestine of *Heptanchus cinereus*), sp. n., Örley (21), p. 219.

Parasitic worms of Birds ; Leidy, P. Ac. Philad. 1885, pp. 9–11.

Tetrarhynchus wardi (heart of *Chlamydoselachus anguineus*), sp. n., Garman, Bull. Mus. C. Z. xii. p. 19.

Development of *Echinococci*; Bull. Soc. Nancy (2) xvii. p xii. ; and Thomas (32, 33).

Stichocotyle nephropis ; Cunningham (5).

Distomum filiferum, sp. n., noticed by Sars, Report on 'Challenger' Schizopods, p. 222. *D. incertum*, sp. n. (mouth of Snake), Cobbold (3), p. 177 ; *D. palliatum* (*Delphinus delphis*), *D. reticulatum* (Shad from Costa Rica), spp. nn., Looss (17). *D. heurkli* (intestine of Tunny), p. 473, *D. dactilipherum* (stomach of *Argonauta* sp.), *D. verrucosum* (stomach of Tunny), p. 474, *D. personatum*, p. 475, *D. megnini*, p. 478, spp. nn. ; *D. pallasi*, n. n. for *Fasciola ventricosa*, p. 477 : Poirier (25). *D. campanulatum* and *D. echinatum* ; Generali, Atti Soc. Mod. (3) ii. pp. 102 & 103. *D. bicoronatum* (*Umbrina cirrhosa*), p. 113, *D. valdeinflatum* (*Gobius jozo*), *D. mulli*, p. 114, *D. gobii* (*G. jozo*), p. 116, *D. depressum* (*Dentex vulgaris*), p. 118, spp. nn., Stossich (31). *D. anguis* (*Anguis fragilis*), *D. lineæ-ovatæ* (*L. ovata*), spp. nn., Linstow (16), pp. 250 & 251.

Monostomum spinosissimum (*Box salpa*), sp. n., Stossich (31), p. 112.
Gasterostomum tergestinum, sp. n., *id. t. c.* p. 119.
Holostomum cornucopiæ : development ; Linstow (16), p. 253.
Choricotyle marionis (on *Mœna vulgaris*), sp. n., Saint-Loup, C.R. ci. p. 176.

NEMATOHELMINTHES.

40. Bütschli, O. Zur Herleitung des Nervensystems der Nematoden. Morph. JB. x. pp. 486–493, pl. xxiii.

41. Bell, F. J. Note on a Nematoid Worm (*Gordius verrucosus*) collected by Mr. H. H. Johnston on Kilima-njoro. P. Z. S. 1884, p. 236 [and Johnston, Kilima-njoro Expedition (London : 1885), pp. 364 & 365].

42. De Man, J. G. Helminthologische Beitraege. Tijdschr. Nederl. Dierk. Ver. (2) i. pp. 1–26, pls. i.–iii.

43. Firket, C. Note sur plusieurs cas d'anchylostomaisie observés en Belgique. Arch. Biol. v. pp. 581–609.

44. Fritsch, G. Zur Anatomie von *Bilharzia hæmotobia* (Cobbold). Zool. Anz. viii. pp. 407–411.

45. Golgi, C., & Monti, A. Sulla storia naturale e sul significato clinico-patologico delli cosi dette Anguillule intestinale e stercorali. Atti Acc. Tor. xxi. pp. 55–59, 1 pl.

46. Hallez, P. Sur le développement des Nématodes. C.R. ci. pp. 170–172 & 831–834 ; Bull. Sci. Nord. vii. & viii. pp. 313–317.

47. Leuckart, R. Ueber die Entwicklung der *Spharularia bombi*. Zool. Anz. viii. pp. 273–277 & 358.

48. Linstow, — v. Zur Kenntniss des Genus *Angiostomum*. Arch. f. Nat. li. pp. 1–13, pls. i. & ii.

49. ——. Ueber einen neuen Entwickelungsmodus bei den Nematoden. Z. wiss. Zool. xlii. pp. 708–717, pl. xxviii.

50. Löw, F. Beiträge zur Kenntniss der Helminthocecidien. Verh. z.-b. Wien, xxxv. pp. 471–476.

51. Müller, K. Neue Helminthocecidien und deren Erzeuger. Inaug. Diss. Berlin : 1883, 8vo, 50 pp., 4 pls.

52. Passerini, N. Sulla *Filaria terminalis* auctor. Atti Soc. Ital. xxvii. pp. 42–62, pls. i.–iii.

53. Schneider, A. Fortgesetzte Untersuchungen über *Spharularia bombi*. Zool. Beitr. i. pp. 247–251.

54. Schoyen, W. M. Bygaalen (*Tylenchus hordei*, sp. n.) en ny, for Bygget skadelig Planteparasit blandt Rundormene. Forh. Selsk. Chr. 1885, No. 22, 16 pp., 1 pl.

55. Zacharias, O. Ueber die Bedeutung des Palm-form Stadiums in der Entwicklung von Rotatorien und Nematoden. Biol. Centralbl. v. pp. 228–233.

Linstow (49) recognizes fourteen modes of development among the Nematoids; he more particularly describes that of *Nematoxys longicauda*, which he compares with that of *Polystomum integerrimum*. Hallez (46) has investigated the earlier stages in the development of *Ascaris megalocephala*. Bütschli (40) points out the resemblances between the nervous system of the round and of some of the flat worms.

Leuckart (47) and Schneider (53) have contributed to the life-history of *Spharularia*.

Natural history and pathology of *Anguillula stercoralis*; Golgi & Monti (45). Sur la réviviscence de l'anchylostome duodénal; Chatin, C.R. Soc. Biol. (8) ii. p. 503. Anchylostoma in Belgium (43).

Genera and Species.

De Man (42) describes as new:—

Monohystera dinitheriana (Netherlands), p. 2;

Dorylaimus ettersbergensis, p. 13, *onycephalus*, p. 15 (Mid-Germany), *D. zograffi*, p. 24 (Russia).

He has notes on, among others:—

Mononchus tunbridgensis, *Dorylaimus regius*, *D. intermedius*, and *D. longicaudatus*, from the Netherlands.

A list is given of the 38 species found near Weimar, among which are:—

Cephalobus rigidus, *Aphelenchus modestus*, *D. intermedius*, *D. leuckarti*, and *D. limnophilus*.

A list is given of 33 species collected near Moscow, among which are:—

Monohystera paludicola, *Cephalobus buetschlii*, *Dorylaimus attenuatus*, and *D. crassus*.

Agamonema campbelli, sp. n. (various fishes); Chatin (2), p. 4;

Agamonematodum bombinatoris (*Bombinator igneus*); Linstow (16), p. 245.

Linstow (48) describes:—

Angiostomum macrostomum (on lungs of *Anguis fragilis*), *A. entomelas*, *nigrovenosum*, *rubrovenosum*, and *sanguinolentum*.

Ankylostomum perniciosum, sp. n. (*Felis tigris*); Linstow (16), p. 238.

Ascaris thymalli (*Thymallus vulgaris*), *A. lotæ* (*L. vulgaris*), Linstow (16), p. 242; *A. apterycis*, p. 38, *A. filholi* (in fishes), spp. nn., p. 39, Chatin (2); *A. affinis*, sp. n. (*Mustelus lævis*), p. 217, Orley (21).

Calodium convolutum, from *Ossifraga gigantea*; Fourment, C.R. Soc. Biol. (8) ii. p. 703.

Filaria obtusans, sp. n. (head of Pike), Prenant (26), p. 214; *F. conoura* (*Anguilla vulgaris*), p. 242, *F. glomeridis* (*G. limbata*), *F. vesperuginis* (*V. serotinus*), p. 234, Linstow (16).

Oxyuris limbata (*Glomeris limbata*), p. 246;

Trichosoma filiforme (*Triton alpestris* and *T. cristatus*), p. 247: Linstow (16).

Sclerostoma struthionis, sp. n., Horst, N. Leyd. Mus. vii. pp. 263–268, pl. viii. (from intestine of *Struthio molybdophanes*).

Spiroptera campbelli, sp. n. (from *Nototænia filholi*), Chatin (2), p. 37.

Spiropterina elegans, sp. n. (intestine of *Hexanchus griseus*), Örley (21), p. 218.

Nematoxys longicauda, g. & sp. nn. (intestine of *Triton alpestris* and *T. cristatus*), Linstow (49).

Heterodera diagnosed ; *H. radicicola*, sp. n. : Müller (51), p. 46.

Tylenchus hordei, sp. n., Schoyen (54).

Dochmius balsami, sp. n., Generali, Atti Soc. Mod. (3) ii. p. 100.

Development of *Trichocephalus* ; *Railliet, Paris, 1885 (*cf.* Zool. Anz. viii. p. 345).

On *Dracunculus* ; * Fahmy, Paris, 1885 (*cf. t. c.* p. 343).

Gordius emarginatus (from *Lithobius forficatus*) ;

Mermis acuminata (in larva of *Hyberina defoliaria*), *M. nigrescens* (in larva of *Ypsipetes sordidata*) : Gadeau de Kerville, Ann. Soc. Ent. Fr. (6) v. p. clx.

Gordius verrucosus : distribution ; Bell (41).

Nematoid in human eye ; *Addario, Pavia, 1885 (*cf.* Zool. Anz. ix. p. 65).

ACANTHOCEPHALI.

56. Villot, A. Sur l'état larvaire et l'hôte intermédiaire de l'*Echinorhynchus clavaceps*, Zeder. Zool. Anz. viii. pp. 19–22.

Echinorhynchus magrettii, sp. n. (from *Buceros erythrorhynchus*), Parrona (23), p. 442; *E. corrugatus* (from the body-cavity of *Euphausia pellucida*), sp. n., Sars, Report 'Challenger' Schizopoda, p. 222.

ROTATORIA.

57. Hudson, C. T. On Four New Species of the Genus *Floscularia*, and Five other New Species of *Rotifera*. J. R. Micr. Soc. (2) v. pp. 608–614, pl. xii.

58. Imhof, O. E. Die Rotatorien als Mitglieder der pelagischen und Tiefseefauna der Süsswasserbecken. Zool. Anz. viii. pp. 322–325.

59. ——. Pelagische Thiere auf Süsswasserbecken in Elsass-Lothringen. *T. c.* pp. 720–723.

60. Plate, L. Beiträge zur Naturgeschichte der Rotatorien. Jen. Z. Nat. xix. pp. 1–120, pls. i.–iii.

Plate (60) thus arranges the fresh-water *Rotifera* in families : *Tubicolarina*, *Philodinæa*, *Polyarthræa* (*Triarthra terminalis*, sp. n.), *Hydatinæa* (*Hertwigia volvocicola*, sp. n.), *Macrodactylea*, *Loricata* (*Brachionus bidens* and *B. decipiens*, spp. nn.), and *Asplanchnæa*. He deals in detail with the systems of organs, and especially describes the males where known ; the *Rotatoria* appear to be allied to Annelids, but differ in some particulars from the trochophore.

Development of Rotifers; Pereyaslavtseff, Nature, xxxii. p. 579 (and *cf.* Zool. Anz. viii. p. 590).

Floscularia mira, *F. mutabilis*, p. 609, *F. calva*, p. 610;
Conochilus dossuarius, p. 611;
Notommata spicata, p. 612;
Stephanops armatus, p. 613;
Pompholyx sulcata, p. 613;
Taphrocampa saundersiæ, p. 614, spp. nn., all British: Hudson (57).

A table is given (p. 613) of the species of *Stephanops*.

Anuræa tuberosa, *A. intermedia*, spp. nn., p. 323, *A. aculeata* var. *regalis*, var. n., p. 325; Imhof (58).

On *Stephanoceros eichhornii*, *Lacinularia socialis*, and *Hydatina brachydactyla*, see Hartmann, SB. nat. Fr. 1885, pp. 17–21.

Rotifers of Buda-Pest; Daday, Term. füzetek, ix. pp. 210–214; *Brachionus budapestinensis*, sp. n., p. 211.

Pleurotrocha mustela, sp. n. (Glasgow); P. Phil. Soc. Glasg. xvi. pp. 188–193, pl. v.

GEPHYREA.

61. Apel, W. Beitrag zur Anatomie und Histologie des *Priapulus caudatus* (Lam.) und des *Halicryptus spinulosus* (v. Sieb.). Z. wiss. Zool. xlii. pp. 459–529, pls. xv.–xvii.

62. Caldwell, W. H. Blastopore, Mesoderm, and Metameric Segmentation. Q. J. Micr. Sci. xxv. pp. 15–28, pl. ii.

63. Lankester, E. Ray. *Golfingia macintoshi*, a new Sipunculid from the Coast of Scotland. Tr. L. Soc. (2) ii. pp. 469–474, pls. lv. & lvi.

64. Scharff, R. The Skin and Nervous System of *Priapulus* and *Halicryptus*. Q. J. Micr. Sci. xxv. pp. 193–213, pl. xiv.

65. Selenka, E. (assisted by De Man, J. G., & Bülow, C.). Die Sipunculiden. Wiesbaden: 1883 and 1884 [see Zool. Rec. xx. *Verm.* p. 8], 4to, 131 pp., 14 pls.

66. ——. Report on the *Gephyrea* collected by H.M.S. 'Challenger' during the years 1873–1876. 1885; 4to, 25 pp., 4 pls. [For short account of results, see Chall. Nar. i. pp. 907 & 908.]

Apel (61) and Scharff (64) have contributed to our knowledge of the anatomy of *Priapulus* and *Halicryptus*; the course of the peripheral nerve-fibres is especially described.

The new genus *Golfingia* (63) is allied to *Aspidosiphon*, but differs in the possession of a "scleropyge" and a "sclerorhynchus," in the arrangement of the retractors, and the character of the oral tentacles. *G. macintoshi*, sp. n., off the E. coast of Scotland.

Caldwell (62) makes the development of *Phoronis* the text for some general morphological considerations.

The forms described by Selenka (66) are:—
Sternaspis princeps, sp. n. (37° 34′ S., 179° 22′ E.), p. 6;
Echiurus unicinctus, p. 6;
Thalassema faex, sp. n. (60° 34′ N., 4° 40′ E.), p. 7; *T. baroni*, p. 8;
Bonellia suhmii, sp. n. (off Nova Scotia), p. 9;
Phascolosoma vulgare, p. 10, var. *astuta*, var. n., *P. pudicum*, sp. n. (Kerguelen), p. 11, *P. capense*, p. 11, *P. prioki*, p. 11, *P. catherinæ*, p. 12, *P. flagriferum*, sp. n. (35° 41′ N., 157° 42′ E.), p. 13;
Dendrostoma blandum, p. 14;
Phascolion squamatum, p. 15, *P. lutense* (53° 55′ S., 108° 35′ E.), p. 16, *P. tubicola*, p. 17, *P. botulus*, sp. n. (4° 21′ S., 129° 7′ E.), p. 18, *P. strombi*, p. 18;
Aspidosiphon speculator, sp. n. (Cape Vincent), p. 19, *A. truncatus*, p. 20;
Phymosoma japonicum, *P. scolops*, p. 21;
Sipunculus nudus, p. 22.
There is added a notice of *Chætoderma militare*, sp. n. (9° 26′ N., 123° 45′ E.), as to the systematic position of which Selenka is still in doubt.

Selenka & De Man (65) describe as new:—
Phascolosoma semperi, p. 37 (Philippines);
Phascolion lucifugax, p. 43 (Philippines, Japan), *P. manceps*, p. 44 (Philippines), *P. collare*, p. 45 (Philippines), *P. hedræum*, p. 49 (Rio de Janeiro).
Phymosoma asser, p. 59 (Batjan), *P. pelma*, p. 60 (Philippines), *P. lurco*, p. 61 (Philippines), *P. dentigerum*, p. 67 (Philippines), *P. scolops*, p. 75 (Philippines).
Dendrostoma blandum, p. 85 (Japan), *D. signifer*, p. 86 (Philippines).

And Selenka & Bülow (65):—
Sipunculus titubans, p. 100 (Puntarenas), *S. vastus*, p. 103 (Mauritius), *S. mundanus*, p. 108 (Sow and Pigs Bank), *S. boholensis*, p. 109 (Bohol);
Aspidosiphon klunzingeri, p. 115 (Koseir), *A. tortus*, p. 119 (Philippines), *A. venabulum*, p. 123 (Congo);
Cleosiphon mollis, p. 128 (Philippines);
Phascolosoma dissors, n. n. for *P. papilliferum*, p. 31.

Sluiter has full accounts of his new *Gephyrea* [see Zool. Rec. xix. *Verm.* p. 9] in Tijdschr. Nederl. Ind. xli.; *Aspidosiphon fuscus*, pp. 86–110, pls. i. & ii.; *Sipunculus* and *Phascolosoma*, pp. 148–171, pls. i.–iii. On *Sternaspis*, and its relations to the *Echiuri*, pp. 235–287, pls. i.–iii.

W. A. Haswell, P. Linn. Soc. N. S. W. x. pp. 331-332, has a note on an Australian species of *Bonellia*, which he cannot distinguish specifically from *B. viridis*.

ANNULATA.

67. Andrews, E. A. Affinities of Annelids to Vertebrates. Am. Nat. xix. pp. 767–774.

68. Beddard, F. E. Preliminary Note on the Nephridia of a New Species of Earthworm. P. R. Soc. xxxvii. pp. 459–464.

69. ——. Notes on the Structure of a New Species of Earthworm belonging to the Genus *Acanthodrilus*. P. R. Phys. Soc. viii. pp. 369–377.

70. ——. Note on the Nephridia of a Species of *Acanthodrilus*. Zool. Anz. viii. pp. 289 & 290.

71. ——. Note on the Paired Dorsal Vessel of certain Earthworms. P. R. Phys. Soc. viii. pp. 424–430, pl. xxii.

72. ——. Sur les organes segmentaires de quelques Vers à terre. Ann. Sci. Nat. (6) xix. Art. No 6, 19 pp., 1 pl.

73. ——. On the Specific Characters and Structure of certain New Zealand Earthworms. P. Z. S. 1885, pp. 810–832, pls. lii. & liii.

74. Bell, F. J. Notice of Two *Lumbrici* with bifid hinder ends. Ann. N. H. (5) xvi. pp. 475–477.

75. Bergh, R. S. Die Metamorphose von *Aulostoma gulo*. Arb. Inst. Würzb. vii. pp. 231–291, pls. xii.–xv.

76. Drasche, R. von. Beiträge zur Entwickelung der Polychæten. Wien: 8vo. I. Entwickelung von *Pomatoceros triqueter*; 1884, 10 pp., 3 pls. II. Entwickelung von *Sabellaria spinulosa*, *Hermione hystrix*, und einer Phyllodocide; 1885, 23 pp., 5 pls.

77. ——. Beiträge zur feineren Anatomie der Polychæten. Wien: 8vo. I. Anatomie von *Spinther miniaceus*; 1885, 14 pp., 2 pls. II. Anatomie von *Owenia filiformis*; 1885, 22 pp., 2 pls.

78. Dutilleul, G. Sur l'appareil génital de *Pontobdella muricata*. Bull. Sci. Nord. vii. & viii. pp. 349–354, and ix. [1886] pp. 127–130, pl. i.

79. Fewkes, J. W. On the Larval Forms of *Spirorbis borealis*. Am. Nat. xix. pp. 247–257, pls. xi. & xii.

80. Fielde, A. M. Observations on Tenacity of Life and Regeneration of Excised Parts in *Lumbricus terrestris*. P. Ac. Philad. 1885, pp. 20–22.

81. Greef, R. Ueber die pelagische Fauna an den Küsten der Guinea-Inseln. I. Pelagische Anneliden von Rolas. Z. wiss. Zool. xlii. pp. 437–458, pls. xii.–xiv.

82. Haswell, W. A. On a Destructive Parasite of the Rock Oyster. P. Linn. Soc. N. S. W. x. pp. 272–275.

83. ——. Minute Structure of *Polynoe*. *T. c.* pp. 278 & 279.

84. Hatschek, B. Zur Entwicklung des Kopfes von *Polygordius*. Arb. z. Inst. Wien, vi. pp. 109–120, 1 pl.

85. ——. Entwicklung der Trochophora von *Eupomatus uncinatus*, Philippi (*Serpula uncinata*). *T. c.* pp. 121–148, 5 pls.

86. Horst, R. Ueber ein räthselhaftes Organ bei den Chlorœmiden Qfg. (Pherusea, Gr.). Zool. Anz. viii. pp. 12–15.

87. ——. Midden-Sumatra. Pt. xii., *Vermes*, 13 pp., 1 pl.

88. Jaquet, M. Recherches sur le système vasculaire des Annélides. MT. z. Stat. Neap. pp. 297–398, pls. xx.–xxii.

89. Jourdan, E. Structure des élytres de quelques Polynoës. Zool. Anz. viii. pp. 128–134.

90. Kükenthal, W. Ueber die lymphoiden Zellen der Anneliden. Jen. Z. Nat. xviii. pp. 319–364, pls. x. & xi.

91. Lemoine, —. De la section spontanée et artificielle de l'*Enchytræus albidus*. C.R. Ass. Fr. Sci. xiii. pp. 323–326.

92. Lessona, M. Sull' Anatomia dei Polioftalmi. Mem. Acc. Tor. (2) xxxv. pp. 309–325, 1 pl.

93. MacMunn, C. A. On the Chromatology of the Blood of some Invertebrates. Q. J. Micr. Sci. xxv. pp. 469–490, pls. xxxiii. & xxxiv.

94. M'Intosh, W. C. Report on the *Annelida Polychæta* collected by H.M.S. 'Challenger' during the years 1873–76. Challenger Reports, xii. 1885, 554 pp., pls. i.–lv. & i.A–xxxix.A. [For short notice, see Chall. Nar. i. pp. 628–635.]

95. Michaelsen, W. Vorläufige Mittheilungen über *Archenchytræus möbii*, sp. n. Zool. Anz. viii. pp. 237–239.

96. Nasse, D. Beiträge zur Anatomie der Tubificiden. Bonn : 1882, 4to, 30 pp., 2 pls.

97. Nusbaum, J. Zur Entwickelungsgeschichte der Geschlechtsorgane der Hirudineen (*Clepsine complanata*, Sav.). Zool. Anz. viii. pp. 181–184.

98. Örley, L. A Palæartikus Övben élö terrikoláknak Revisiója és Elterjedése (Revisio et distributio specierum terricolarum regionis palæarticæ). Ért. Term. Kör. xv., 34 pp.

99. Pruvot, G. Recherches anatomiques et morphologiques sur le système nerveux des Annélides polychètes. Arch. Z. expér. (2) iii. pp. 211–336, pls. xi.–xvi.

100. Reighard, J. On the Anatomy and Histology of *Aulophorus vagus*. P. Am. Ac. xx. pp. 88–106, 3 pls.

101. Rohde, E. Die Musculatur der Chætopoden. Zool. Beitr. i. pp. 164–204 & 303, pls. xxiv.–xxvii. ; Zool. Anz. viii. pp. 135–138.

102. *Rosa, —. I lumbricoidi del Piemonte. Torino : 1884, 54 pp., 1 pl.

103. Roule, L. Esquisse du développement de la *Dasychone lucullana*, D. Ch. Rev. Sci. Nat. (3) iv. pp. 463–470.

104. Saint-Joseph, — de. Sur les Annélides polychètes des côtes de Dinard. C.R. ci. pp. 1509–1512.

105. Saint-Loup, R. Recherches sur l'organisation des Hirudinées. Ann. Sci. Nat. (6) xviii. No. 2, 127 pp., pls. vi.–xiii.

106. ——. Sur l'organisation du *Pachydrilus enchytræoides*. C.R. ci. pp. 482–485.

107. ——. Remarques sur la morphologie des Hirudinées d'eau douce. Bull. Soc. Philom. (7) ix. pp. 23–26.

108. Salensky, W. Études sur le développement des Annélides. 2me partie. Développement de *Branchiobdella*. Arch. Biol. vi. pp. 1–64, pls. i.–v.

109. Stolc, A. Vorläufige Bericht über *Ilyodrilus coccineus*, Vejd. (Ein Beitrag zur Kenntniss der Tubificiden.) Zool. Anz. viii. pp. 638–643 & 656–662.

110. Ude, H. Ueber die Rückensporen der tericolen Oligochæten, nebst Beiträgen zur Histologie des Leibbesschlauches und zur Systematik der Lumbriciden. Z. wiss. Zool. xli. pp. 87–143, pl. iv.

111. Vejdovsky, F. System und Morphologie der Oligochæten. Prague: 1884 (appeared in 1885), fol., 172 pp., 16 pls.

112. Viguier, C. Sur les Annélides pélagiques de la baie d'Alger. C.R. ci. pp. 578 & 579. [Ann. N. H. (5) xvi. p. 395.]

113. Voigt, W. Ueber Ei- und Samenbildung bei *Branchiobdella*. Arb. Inst. Würzb. vii. pp. 300–368, pls. xvi.–xviii.

114. Vorderman, A. G. Bijdrage tot de kennis van den Soudarie-Worm. Tijdschr. Nederl. Ind. xli. pp. 111–116, 1 pl.

General Morphology.

Hatschek (85) has examined the trochophore of *Eupomatus uncinatus*, and has discovered an auditory vesicle; the same is found in an allied larva from Faroe. Fewkes (79) gives an account of the larva of *Spirorbis borealis*; the shell is at first horn-shaped. Hatschek (84) finds that *Polygordius* confirms his account of the development of the nervous system, as against Kleinenberg. Drasche (76) has studied *Pomatoceros* and *Sabellaria*, and (77) *Spinther* and *Owenia*, and Roule (103) *Dasychone*.

Harker, Nature, xxxii. p. 564, thinks that the colouration of the anterior segments of the *Maldanidæ* is not of a respiratory function.

Pruvot (99) gives an elaborate account of the nervous system of the *Polychæta*, which is always to some extent continuous with the hypodermis. The musculature of Chætopods has been investigated by Rohde (101), and the vascular system by Jaquet (88). Kükenthal's (90) observations were made on a species of *Tubifex*. Beddard (68, 70, 72) has made further contributions to our knowledge of the nephridia.

Ude (110) describes the structure and arrangement of the dorsal pores of tericolous *Oligochæta*.

Reighard (100) describes the structure of *Aulophorus vagus*, which in many points resembles *Dero obtusa*.

Stole's (109) report on *Ilyodrilus coccineus* is a contribution to the knowledge of the *Tubificidæ*, which he proposes to divide into the 3 subfamilies of *Ilyodrilini*, *Tubificini*, and *Telmatodrilini*. Anatomy of *Tubificidæ*; Nasse (96).

Beddard (71) reports that in two earth-worms the dorsal vessel is formed of two separate tubes, which only unite upon the pharynx.

Saint-Loup (105) has an elaborate paper on the organization of the *Hirudinea*.

The development of *Branchiobdella* is described by Salensky (108), who finds essential differences between it and *Clepsine* or *Nephelis*; Voigt (113) describes the oogenesis and spermatogenesis. Nusbaum (97) describes the development of the sexual organs of *Clepsine*. Bergh (75) has investigated the metamorphosis of *Aulostoma*. On the generative apparatus of *Pontobdella*; Dutilleul (78).

Genera and Species.

The species described and noticed by McIntosh (94) in his important monograph are thus arranged :—

Euphrosynidæ.

Euphrosyne capensis, p. 1, *E. borealis*, p. 5.

Amphinomidæ.

Chlœia flava, p. 8, *C. fusca*, sp. n. (Bauda), p. 14.
Chlœnea atlantica, sp. n. (S. of the Canaries), p. 15.
Notopygos megalops (off Bermuda), p. 17, *N. labiatus* (Basilan Strait), p. 19, spp. nn.
Amphinome rostrata, p. 21.
Hermodice caruculata, p. 24.
Eurythoe pacifica, p. 27, var. *leculxensis*, p. 29.
Hipponoe gaudichaudi, p. 30.

Aphroditidæ.

Aphrodite aculeata, *A. australis*, p. 34, *A. echidna*, p. 35, *A. intermedia*, sp. n. (West Indies), p. 38.
Hermione hystrix, p. 39.
Lætmonice filicornis, p. 39, *L. producta* var. *wycillei*, p. 44, var. *benthaliana*, p. 45, var. *willemoesi*, p. 47, var. *assimilis*, p. 49; *L. japonica* (S. of Japan), p. 50, *L. aphroditoides* (S. of Yeddo), p. 51, spp. nn.

Palmyridæ.

Palmyra aurifera, p. 53.

Polynoidæ.

Iphionella, g. n., for *Iphione cimex*, p. 58.

Euphione, g. n., for *E. elisabethæ*, sp. n. (S. of the Cape of Good Hope), p. 62.

Lepidonotus squamatus, *L. gymnonotus*, p. 64, *L. wahlbergi*, p. 66, *L. cristatus*, p. 67.

Eunoa iphionoides, p. 69 (off New Zealand), *E. opalina* (Strait of Magellan), p. 71, *E. capensis*, p. 72, *E. abyssorum* (St. 160, 2600 fath.), p. 73, *E. mindanaoensis*, p. 74, *E. yedoensis*, p. 75, spp. nn.

Polyeunoa lævis, g. & sp. n. (off Prince Edward Island), p. 76.

Dasylepis equitis, sp. n. (Faroe Channel), p. 77.

Lagisca propinqua, p. 78; *L. tenuisetis* (St. Vincent, Cape Verde Islands), p. 78, *L. antarctica* (Kerguelen, &c.), p. 80, *L. magellanica*, p. 82, var. *murrayi*, p. 83, var. *grubii*, p. 84, *L. peracuta* (St. Vincent), p. 85, *L.* (*Agnodice*) *moseleyi* (middle of Atlantic), p. 87, *L. crosetensis* (Crozet Islands), p. 88, *L. yokohamiensis*, p. 89, *L. darwini* (Strait of Magellan), p. 90, *L.* (?) *kermadecensis* (N. of Kermadec Islands), p. 94, *L.* (?) *hexactinellidæ* (from near Zebu), p. 94, spp. nn.

Eulagisca corrientis, g. & sp. n. (S. of Buenos Ayres), p. 91.

Harmothoe benthaliana, sp. n. (St. 45, 1240 fath.), p. 95, *H. haliæti*, p. 96.

Eucarne kerguelensis (Kerguelen), p. 97, *E. tenuisetis* (W. of Gibraltar), p. 99, spp. nn., *E. johnstoni*, p. 99.

Lœnilla fusca, sp. n. (off La Plata), p. 100.

Eupolynoe mollis, p. 101.

Allmaniella, g. n.; *A. setubalensis*, sp. n., p. 102.

Scalisetosus, g. n.; *S. ceramensis*, sp. n., p. 103.

Hermadion kerguelensis, sp. n., p. 105.

Polynoe (*Langerhansia*) *euplectellæ* (off Philippines), p. 108, *P.* (?) *ascidioides* (in Ascidian), p. 109, *P. platycirrata* (Bass Strait, &c.), p. 111, *P. capensis*, p. 114, *P. pustulata* (Bermuda), *P.* (*Lepidonotus*) *iphionoides* (Basilan Strait), p. 116, *P. magnipalpa* (N. of Kermadec Islands), p. 118, *P. attenuata* (near Cape Town), p. 120, *P.* (*Macellicephala*) *mirabilis* (N.W. of New Zealand), p. 121, *P.* (*Robertianella*) *synophthalma* (Atlantic), p. 122, *P.* (*Admetella*) *longipedata* (E. of Prince Edward Island), p. 124, *P. ocellata* (off Kobé, Japan), p. 126, spp. nn.

Polynoella, g. n.; *P. levisetosa*, sp. n. (S. of Yedo), p. 128.

Eulepis wyvillei (off Bermuda), p. 131, *E. challengeriæ* (Sombrero Island, W. I.), p. 134, spp. nn.

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Eupompe australiensis, sp. n. (N. Australia), p. 135.

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Thalenessa (char. emend.) *digitata* (Admiralty Islands), p. 140, *T. oculata* (Bass Strait, Tongatabu), p. 142, *T. fimbriata* (off Port Jackson), p. 144, spp. nn.

Sigalion huski (off Faga), p. 145.

Psammolyce occidentalis (Sombrero Island, W. I.), p. 146, *P. fijiensis*, p. 148, spp. nn.

Leanira magellanica, p. 150, *L. arcolata* (S. of Yedo), p. 151, *L.*

japonica (Kobé), p. 154, *L. lævis* (Queen Charlotte Sound), p. 156, spp. nn.; *L. hystricis*, p. 155.

Eupholoe philippinensis, sp. n. (Basilan Strait), p. 157.

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Phyllodoce sancti-vincentis (Cape Verde Islands), p. 166, *P. duplex* (Two-fold Bay), p. 167, spp. nn.

Eulalia capensis (char. emend.), p. 168.

Genetyllis (?) *oculata*, sp. n. (Celebes Sea), p. 169; description of the eyes and cephalic ganglion, by M. Gunn, pp. 170-173.

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Halodora reynaudi, p. 178; eyes described by M. Gunn.

Greefia, n. n. for *Nauphanta*; *G. oahuensis*, sp. n. (Honolulu), p. 182.

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Dalhousia, g. n., for *D. atlantica*, sp. n., p. 186.

Salvatoria, g. n., for *S. kerguelensis*, sp. n., p. 188.

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Exogone heterosetosa, sp. n. (off Marion Island), p. 205.

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Palolo viridis, p. 257 (an account of the history and habits of the worm).

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Eunice magellanica (Strait of Magellan), p. 265, and young, *E. prognatha* (Ascension), p. 268, *E. torresiensis*, p. 270, spp. nn.; *E. œrstedi* (?), p 273, *E. vittata*, p. 275; *E. cirrobranchiata* (Bermuda), p. 277, *E. kobiensis*, p. 278, *E. edwardsi* (Prince Edward Island), p. 280, spp. nn.; *E. aphroditois*, p. 282, *E. torquata*, p. 285, *E. elseyi* (?), p. 286; *E. murrayi* (Simon's Bay), p. 288, *E. mindanavensis*, p. 289, *E. equibranchiata* (off Barra Grande), p. 291, *E. barvicensis* (Bermuda), p. 292, *E. pycnobranchiata* (Bass Strait), p. 294, *E. tribranchiata* (off Cape York), p. 297, *E. bassensis* (Bass Strait), p. 298, spp. nn.

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Macduffia, g. n., for *M. bonhardi*, sp. n. (St. Thomas), p. 303.

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Ranzania (?) *capensis*, sp. n., p. 378.
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Scolecolepis cirrata varr., p. 380.
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Chætozone atlantica, p. 385, *benthalaniana* (Coast of Nova Scotia), p. 386, *pacifica*, p. 387, spp. nn.
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Phyllocomus crocea, p. 427.

Amphicteis gunneri, p. 428; *A. sarsi* (S. Atlantic), p. 429, *A. wyvillei* (Prince Edward Island), p. 430, *A. japonica* (off Yedo), p. 431, spp. nn.

Grubianella, g. n., for *G. antarctica*, sp. n., p. 432, and var.

Samythopsis, g. n., for *S. grubei* (S. of Valparaiso), sp. n., p. 435.

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Loimia savignii (off St. Vincent), sp. n., p. 449.

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Pista sombreriana, sp. n., p. 451; *P. fasciata*, p. 452; *P. abyssicola* (Antarctic), p. 453, *P. mirabilis*, p. 454, and *P. corrientis*, p. 457 (off Rio de la Plata), spp. nn.

Eupista, g. n., for *E. darwini* (S. of Valparaiso), sp. n., p. 458, and var., *E. grubei*, sp. n., p. 459.

Leæna neo-zealaniæ, p. 460, *L. abyssorum* (middle of the Pacific), p. 461, *L. antarctica*, p. 462, *L. langerhansi* (off North Island), p. 463, spp. nn.

Lanassa sarsi (N.E. of North Island), p. 463, *L. benthaliana* (Mid-Atlantic), p. 464, spp. nn.

Euthelepus, g. n., for *E. setubalensis*, p. 465, *E. chilensis*, p. 467, spp. nn.

Thelepus cincinnatus var. n. *canadensis*, p. 469; *T. marenzelleri* (S. Japan), p. 471, sp. n.

Neottis antarctica, p. 472.

Ereutho kerguelensis, sp. n., p. 474.

Polycirrus kerguelensis, sp. n., p. 475.

Ehlersiella, g. n., for *E. atlantica*, sp. n., p. 475.

Artacama challengeriæ (Betsy Cove), p. 477, *A. zebuensis*, p. 478, spp. nn.

Terebellides strœmi, p. 480, var. *kerguelensis*, p. 480; *T. ehlersi* (S. of Fiji), sp. n., p. 482.

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Sabella zebuensis, p. 487, *S. assimilis* (near Buenos Ayres), p. 488, spp. nn.; *S. bipunctata*, p. 489, ? *S. furca*, p. 491.

Laonome hæckeli (St. Vincent), sp. n., p. 492.

Branchiomma vesiculosum, p. 493.

Dasychone bairdi (Bermuda), sp. n., p. 495; *D. picta* (off Kobé), p. 497, *D. orientalis* (Hong Kong), p. 498, *D. japonica*, p. 500, *D. wyvillei* (St. Thomas, W.I.), p. 501, spp. nn.; *D. nigromaculata*, p. 503, *D. violacea*, p. 504; *D. capensis*, sp. n., p. 506.

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Protula capensis, p. 509, *P. lusitanica*, p. 511, *P. arafurensis*, p. 511, *P. americana* (S. of Halifax), p. 512, spp. nn.

Apomatus elisabethæ (New Zealand), sp. n., p. 514.

Serpula sombreriana, p. 515, sp. n.; *S. narconensis*, p. 516, var. n. *magellanica*, p. 518; *S. philippinensis*, p. 519, sp. n.

Pomatocerus strigiceps, p. 520.

Placostegus ornatus, p. 522; *P. benthalianus* (Mid-Pacific), *P. mærchii* (Pacific), p. 524, *P. assimilis* (off Bermudas), p. 525, spp. nn.

Hydroides multispinosa, p. 527.

Spirobranchus occidentalis (off Bermudas), sp. n., p. 529.

Ditrupa arietina, p. 531.

Tomopteris carpenteri, p. 531, *T. onisciformis*, p. 532.

Verrill, P. U. S. Nat. Mus. viii., describes from various stations off the N.E. Coast of America :—

Polynoe acanellæ, *P. aurantiaca*, sp. n., p. 425.

Leanira robusta, sp. n., p. 426.

Amphinome lepadis, sp. n., p. 427.

Leodice benedicti, sp. n., p. 427; *L. polybranchia*, p. 428.

Hyalinœcia artifex, p. 429.

Nothria conchyphila, p. 432.

Notophyllum americanum, sp. n., p. 432.

Anaitis formosa, *A. picta*, spp. nn., p. 433.

Castalia cincinnata, sp. n., p. 434.

Syllis spongiphila, sp. n., p. 435.

Ophioglycera, g. n., for *O. gigantea*, sp. n., p. 436.

Polydora tubifex, sp. n., p. 438.

Ammochares artifex, sp. n., p. 439.

Leprœa abyssicola, sp. n., p. 439.

Sabella picta, sp. n., p. 440.

There are references to his Report in *Rep. U. S. Fish Comm. for 1883 (1885).

Saint-Joseph (104) gives very brief accounts of the following new *Polychæta* from Dinard: *Paractius mutabilis*, *Labrorostratus* (g. n.) *parasiticus*, *Leptonereis vaillanti*, and *Sclerochilus cæcus*.

Polydora polybranchia, sp. n., Haswell (82).

Arenicola glacialis (Point Barrow, Alaska), sp. n., Murdoch, P. U. S. Nat. Mus. viii. p. 522.

Greef (81) has notes on *Tomopteris rolasi* and *T. mariana*, and on the structure of the *Tomopteridæ*. He further describes the following new *Alciopidæ* :—

Vanadis melanopthalmus, p. 448, and *V. setosa*, p. 449;

Rhynchonerella fulgens, p. 450;

Alciopa longirhyncha, p. 453.

Pelagic Annelids of Algiers; Viguier (112). New species only indicated.

Chætopterus: "Une pêche miraculeuse de Chætoptères"; Bull. Soc. L. Norm. (3) pp. 376–379.

For a general account of the system of *Oligochæta*, see Vejdovsky (111).

Örley (98) arranges the genera and species of Palæarctic Oligochætes, and makes a new family of *Criodrilina*;

Allurus neapolitanus, sp. n.;

Octolasion and *Aporrectidea*, gg. nn. of fam. *Lumbricina*;

Lumbricus complanatus, *L. terrestris* var. *rubidus*, *Allolobophora profuga*, *Octolasion frivaldszkyi* (= *L. terrestris* var. *gigas*), *Enterion platyurum*, *O. gracile* (Buda-Pesth), sp. n., *Allobophora transpadana*, *Allolobophora subrubicunda*, *Dendrobæna bœckii*, *Allobophora constricta*, *L. terrestris* var. *lacteus*, *A. alpina*, and *A. minima*, belong to *Octolasion*; and *Enterion chloroticum* and *L. trapezoides* to *Aporrectodea*.

Ude (110) discusses the systematic characters of *Lumbricus*, *Allolobophora*, and *Allurus*, describing the species; *A. hispanica* (p. 135), and *A. longa* (Göttingen, p. 136) are new.

Allolobophora neglecta, sp. n. (Italy), Rosa, Atti Acc. Tor. xviii. p. 171.

Dendrobæna camerani, sp. n. (Italy), *t. c.* p. 172.

Lumbricus glacialis, sp. n., Leidy, P. Ac. Philad. 1885, p. 408 (in ice, N. America).

Acanthodrilus novæ-zelandiæ, *A. dissimilis*, *A. multiporus*, spp. nn., Beddard (73) p. 813; *A. capensis*, sp. n., *id.* (69) p. 373.

Restoration of *Lumbrici*; Horst, Tijdschr. Nederl. Dierk. Ver. (2) i. p. xxxii.; Fielde (80). Bell (74) on *Lumbrici* with bifid ends. Division of *Enchytræus*; Lemoine (91).

Horst (87) describes *Perichæta indica*, n. n. for *P. ungulata*, *P. sumatrana*, *P. hasseltii*, spp. nn., and sp. dub., pp. 4–7;

Urochæta dubia, sp. n., p. 7.

Nais hamata new to Great Britain; Bolton, Mid. Nat. viii. p. 118.

Archenchytræus mœbii, sp. n. (Kiel), Michaelsen (95).*

Notes on Earthworms of Ceylon and North Borneo; Lewis, Nature, xxxi. p. 127.

Hirudo sumatrana, sp. n., and sp. dub., Horst (87) pp. 9 & 10.

Nephelis spp., *id. t. c.* pp. 10–12.

Adenobdella oricola, new leech from mouth of *Ptychochilus lucius*; Leidy, Science, v. p. 434.

Note on *Ctenodrilus pardalis*; Bolton, Mid. Nat. viii. p. 117.

Leeches used as bait; Rathbun, Fishery Industries of the United States, i. (Washington: 1884, 4to), pp. 833–837.

ENTEROPNEUSTI.

115. Bateson, W. Note on the Later Stages of *Balanoglossus kowalevskii*, and on the affinities of the *Enteropneusti*. P. R. Soc. xxxviii. pp. 23–30 [see also Q. J. Micr. Sci. suppl. 1885, pp. 81–122, pls. iv.–ix.].

116. Marion, A. F. Sur deux espèces de Balanoglosses. C.R. ci. pp. 1289–1291.

Bateson (115) describes a structure which he regards as comparable with the notochord of the *Chordata*, and points out the resemblances between the central nervous system of *Balanoglossus* and *Amphioxus*.

B. hacksi (Yokohama) and *B. talaboti* (Marseilles), spp. nn., Marion (116).

The species exhibited by Bell (P. Z. S. 1885, p. 836), from Herm, has since been described by Koehler from the same locality.

Balanoglossi of 'Challenger' Expedition; Willemoes-Suhm, Chall. Nar. i. pp. 195–197.

MYZOSTOMATA.

117. Nansen, F. Bidrag til Myzostomernes Anatomi og Histologi. Bergen: 1885, 4to, 80 pp., 9 pls. (English résumé, pp. 69–80).

Short account of *Myzostomida* of 'Challenger'; Graff, Chall. Nar. i. pp. 313–317.

Nansen (117) has studied *Myzostoma cirriferum*, *M. glabrum*, *M. gigas*, *M. carpenteri*; and *M. giganteum*, and *M. graffi*, spp. nn. (from *Antedon celtica*, pp. 5, 6, & 69). He does not regard the *Myzostomida* as belonging to the *Chætopoda*, but as a distinct group of Annelids, related to Chætopods, but with a tendency to some of the Arachnids and Crustaceans.

Suckers of *Myzostomida*; Niemiec (18).

M. cirripedium, sp. n. (in *Metacrinus rotundus*), Graff, Tr. L. S. (2) ii. p. 444.

Encysting *Myzostoma* in "*Comatula fimbriata*" from Milford Haven; Carpenter, Nature, xxxii. p. 391, and xxxiii. p. 8.

Graff (Palæontogr. xxxi. pp. 185–191, pl. xvi.) adduces evidence of the infesting of fossil Crinoids by *Myzostoma*.

CŒLENTERATA.

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1. ALLMAN, G. J. Description of Australian, Cape, and other *Hydroida*, mostly new, from the Collection of Miss H. Gatty. J. L. S. xix. pp. 132–161, pls. vii.–xxvi.

2. BEDOT, M. Notice sur le développement des Vélelles. Arch. Sci. nat. (3) xiii. p. 444.

3. ——. Sur l'histologie de la *Porpita mediterranea*. Rec. Z. Suisse, ii. pp. 189–194. [Abstr. J. R. Micr. Soc. (2) v. p. 463.]

4. ——. Contribution à l'étude des Vélelles. Rec. Z. Suisse, ii. pp. 237–251, 1 pl. [Abstr. J. R. Micr. Soc. (2) v. p. 1010.]

5. BEHRENS, —. Die Farbstoffe der Aktinien. Biol. Centrabl. v. p. 352. [*Cf.* No. 36.]

6. BELL, F. J. Description of a New Species of Minyad (*Minyas torpedo*) from North-west Australia. J. L. S. xix. pp. 114–116, woodcut.

7. CHUN, C. Ueber die cyklische Entwicklung der Siphonophoren. SB. Ak. Berlin, xxvi. pp. 511–529, 1 pl. [Abstr. J. R. Micr. Soc. (2) vi. pp. 452 & 453.]

8. CLAUS, C. Ueber das Verhältnis von Monophyes zu den Diphyiden, und über die sog. cyclische Entwicklung der Siphonophoren. Zool. Anz. viii. pp. 443–448. [Abstr. J. R. Micr. Soc. (2) v. p. 1010.]

9. DANA, J. D. Origin of Coral Reefs. Am. J. Sci. xxx. pp. 89–105 (with map) & 169–191. [*Cf.* Nature, xxxii. p. 567.]

10. ERDMANN, A. Ueber einige neue Zoantheen. Ein Beitrag zur anatomischen und systematischen Kenntniss der Actinien. Jen. Z. Nat. xix. pp. 430–488, pls. iv. & v., 4 figs. [Abstr. J. R. Micr. Soc. (2) vi. pp. 454 & 455.]

11. FAUROT, —. Sur l'*Adamsia palliata*. C.R. ci. pp. 173–174, and trans. Ann. N. H. (5) xvi. pp. 155 & 156. [Abstr. J. R. Micr. Soc. (2) v. p. 816.]

12. Fewkes, J. W. On a Collection of *Medusæ* made by the United States Fish Commission Steamer 'Albatross' in the Caribbean Sea and Gulf of Mexico. P. U. S. Nat. Mus. viii. pp. 397–402.

13. ——. On the Development of *Agalma*. Bull Mus. C. Z. xi. pp. 239–275, pls. i.–iv. [Abstr. J. R. Micr. Soc. (2) v. pp. 1009 & 1010.]

14. Filhol, H. La Vie au Fond des Mers. Les explorations sous-marins et les voyages du 'Travailleur' et du 'Talisman.' Paris: 300 pp., 96 figs., 8 pls.

Contains several beautiful figures of new and rare Cœlenterates, but no descriptions in the text.

15. Fol, H. Zur Mittelmeerfauna. Zool. Anz. viii. pp. 667–670.

Fol points out that Carus [Zool. Rec. xxi. *Cœl.* p. 1] omits *Errina aspera* (Esp.), and that *Lampetia pancerina* (Chun) should be *L. cucumis* (Fol).

16. Fowler, G. H. The Anatomy of the *Madreporaria*. i. Q. J. Micr. Sci. xxv. pp. 577–597, pls. xl.–xlii. [Reprinted, Studies Biol. Lab. Owens Coll. Manchester, i. 1886, pp. 243–261, pls. xi.–xiii.; abstr. J. R. Micr. Soc. (2) vi. pp. 256 & 257.]

17. Götte, A. Ueber die Entwicklung der *Aurelia aurita* und der *Cotylorhiza borbonica*. Zool. Anz. viii. pp. 554–556; trans. Ann. N. H. (5) xvi. pp. 398 & 399. [Abstr. J. R. Micr. Soc. (2) vi. p. 81.]

18. G. P. The *Actiniæ*. Nature, xxxi. pp. 198 & 199.

Notice of Andres' Monograph [*cf.* Zool. Rec. xxi. *Cœl.* p. 1].

19. Haacke, W. Ueber die ursprünglichen Grundzahlen der Medusen und Echinodermen. Zool. Anz. viii. pp. 505–507; trans. Ann. N. H. (5) xvi. p. 399. [Abstr. J. R. Micr. Soc. (2) vi. p. 48.]

20. Haddon, A. C. A New Species of *Halcampa* (*H. andresii*) from Malahide. P. R. Dubl. Soc. (n.s.) iv. pp. 396–398, pl. xvi. figs. 1–4. [Name withdrawn, see No. 22.]

21. ——, & Dixon, G. Y. The Structure and Habits of *Peachia hastata* (Gosse). i. *T. c.* pp. 399–406, pls. xvi. figs. 5–8, xvii. & xviii.

Historical, descriptive, habits.

22. ——. Note on *Halcampa chrysanthellum*, Peach. Ann. N. H. (5) xvi. p. 523.

23. Hubrecht, A. A. W. On a New Pennatulid from the Japanese Sea. P. Z. S. pp. 512–518, pl. xxx. [Abstr. J. R. Micr. Soc. (2) vi. p. 81.]

24. Klebs, G. Zur Kenntniss der physiologischen Funktion des Chlorophylls im Tierreich. Biol. Centralbl. iv. pp. 745–748. [*Cf.* Graff, Zool. Rec. xxi. *Cœl.* p. 2.]

25. Lendenfeld, R. von. Ueber Cœlenteraten der Südsee. v. Mittheilung. Die Hydromedusen des australischen Gebietes. Z. wiss. Zool. xli. pp. 616–672.

26. [Lendenfeld, R. von.] vi. Mittheilung. *Neis cordigera*, Lesson, eine australische Beroide. *T. c.* pp. 673–682, pl. xxxiii. [Abstr. J. R. Micr. Soc. (2) v. p. 656.]

27. ——. Addenda to the Australian *Hydromedusæ*. P. Linn. Soc. N. S. W. ix. pp. 908–924, pls. xl.–xliii.

Additions to and corrections of former papers.

28. ——. Local Colour-Varieties of *Scyphomedusæ*: a New Species produced in Forty Years? *T. c.* pp. 925–928. [*Cf.* Zool. Rec. xxi. *Cœl.* pp. 4 & 9.]

29. ——. The Metamorphosis of *Bolina chuni*, sp. n. *T. c.* pp. 929–931, pls. xliv. & xlv.

30. ——. Addendum to the Australian *Hydromedusæ*. ii. *T. c.* pp. 984 & 985.

31. ——. Note on a *Medusa* from the Tropical Pacific. *Op. cit.* x. p. 241.

Confirms the absence of the Zangenkegel in *Liriope rosacea*.

32. ——. Addendum to the Australian *Hydromedusæ*. iii. *T. c.* pp. 477–480.

Giving additions.

33. ——. Addendum to the Australian *Hydromedusæ*. iv. *Hydra hexactinella*, nova species. *T. c.* pp. 679–681, pl. xlviii.

34. Mackintosh, H. W. Report on Irish Zoophytes. Pt. i. On some Rare Sea Anemones taken at Greystones, Co. Wicklow, with Remarks on the Marine Invertebrate Fauna of that District. P. R. Irish Ac. (2) iv. (Sci.) [1884], pp. 52–58.

35. M'Intosh, W. C. Notes from the St. Andrew's Marine Laboratory (under the Fishery Board of Scotland). i. On the British Species of *Cyanea*, &c. Ann. N. H. (5) xv. pp. 148 & 149.

36. McMunn, C. A. Observations on the Chromatology of *Actiniæ*. (Abstr.) P. R. Soc. xxxviii. pp. 85–87. [Abstr. Nature, xxxii. pp. 68 & 69; J. R. Micr. Soc. (2) v. pp. 464 & 656; and Biol. Centralbl. v. p. 352. *Cf.* No. 5.]

37. Marshall, A. M. The Morphology of the Sexual Organs of *Hydra*. P. Manch. Soc. xxv. pp. 32–36. [Reprinted in Stud. Biol. Lab. Owens Coll. Man. i. 1886, pp. 324–328; abstr. J. R. Micr. Soc. (2) vi. p. 256.]

38. Marshall, W. Die Entdeckungsgeschichte der Süsswasser-Polypen. (Inaugural lecture.) Leipzig: 1885, 8vo, 31 pp.

39. Metschnikoff, E. Vergleichend-embryologische Studien. iv. Ueber die Gastrulation und Mesodermbildung der Ctenophoren. Z. wiss. Zool. xlii. pp. 648–656, pls. xxiv. & xxv. figs. 1–43. [Abstr. J. R. Micr. Soc. (2) vi. p. 256.]

40. Moseley, H. N. The *Pennatulida* of the Norwegian North Atlantic Expedition. Nature, xxxii. pp. 74 & 75. [*Cf.* Zool. Rec. xxi. *Cœl.* p. 2.]

41. Pennington, A. S. British Zoophytes: an Introduction to the *Hydroida*, *Actinozoa*, and *Polyzoa* found in Great Britain, Ireland, and the Channel Islands. London: 8vo (*Hydrozoa*, pp. 22–135, pls. i.–x.; *Actinozoa*, pp. 136–200, pls. xi.–xv.). [*Cf.* Zoologist (3) x. pp. 37–40.]

42. Quelch, J. J. On some Deep-Sea and Shallow-Water *Hydrozoa*. Ann. N. H. (5) xvi. pp. 1–20, pls. i. & ii.

43. ——. Note on Deep-Sea and Shallow-Water *Hydrozoa*. *T. c.* p. 156.

44. Ridley, S. O. List of the Organisms found adhering to three anchors dredged up from the Bay of Menado, Celebes. In H. O. Forbes' Naturalist's Wanderings in East. Arch. London: 1885, p. 496.

45. Romanes, G. J. Jelly-Fish, Star-Fish, and Sea Urchins. London: 1885, 323 pp., 63 figs.

46. Ryder, J. A. The Development and Structure of *Microhydra ryderi*, Potts. Am. Nat. xix. pp. 1232–1236, woodcut. [Abstr. J. R. Micr. Soc. (2) vi. p. 454.]

47. Thallwitz, J. Ueber die Entwicklung der männlichen Keimzellen bei den Hydroideen. Jen. Z. Nat. xviii. pp. 385–444, pls. xii.–xiv. [Abstr. J. R. Micr. Soc. (2) v. pp. 462 & 463.

48. Ussow, M. M. *Polypodium hydriforme*. Arb. Nat. Ges. Kasan, xiv. 24 pp. [In Russian.] [*Cf.* J. R. Micr. Soc. (2) vi. pp. 803–805.]

Polypodium hydriforme, g. & sp. nn., marine Cœlenterate.

49. Verrill, A. E. Notice of Recent Additions to the Marine *Invertebrata* of the North-Eastern Coast of America, with descriptions of new genera and species, and critical remarks on others. Pt. v., *Annelida*, *Echinodermata*, *Hydroida*, *Tunicata*. P. U. S. Nat. Mus. viii. pp. 423–448.

50. ——. Notice of the Remarkable Marine Fauna occupying the Outer Banks off the Southern Coast of New England, No. 11. Am. J. Sci. (3) xxix. pp. 149–157.

51. Viguier, C. Sur le Tétraptère, *Tetraplatia volitans*, Busch. C.R. c. pp. 388–390. [Abstr. J. R. Micr. Soc. (2) v. p. 252.]

52. Vosmaer, G. C. J. (Zool. Anz. viii. p. 218) gives a list of some Actinian genera omitted from Scudder's "Nomenclator Zoologicus."

53. Wagner, N. Die Wirbellosen des Weissen Meeres. I. Leipzig: 1885, 4to, 171 pp., 21 pls.

Palæontology.

54. Dupont, É. Sur les calcaires frasniens d'origine coralliene et sur leur distribution dans le massif paléozoique de la Belgique. Bull. Ac. Belg. (3) x. pp. 21–38.

55. Etheridge, R. [Jun.], & Foord, A. H. Note on *Laceripora cribrosa*, Eichwald. Ann. N. H. (5) xvi. pp. 385 & 386, woodcut.

The authors now find that *Laceripora cribrosa*, Eich., is a Favositoid Coral, and not a *Chætetes*. [*Cf.* Zool. Rec. xxi. *Cœl.* p. 5.]

56. Herrmann, O. Die Graptolithenfamilie *Dichograptidæ*, Lapw., mit besonderer Berücksichtigung von Arten aus dem norwegischen Silur. N. Mag. Naturv. xxix. pp. 122–208 & 209–214, with figs. [and separate, Inaug. Diss. (Leipzig) Christiania: 1885, 8vo, 94 pp.].

57. ——. On the Distribution of the *Graptolithidæ* in Time and Space. Geol. Mag. pp. 406–412. [Transl. from N. Mag. Naturv. xxix.]

58. ——. On the Organization and Economy of the *Graptolithidæ*. *T. c.* pp. 448–460, figs. 1–6. [Transl. from N. Mag. Naturv. xxix.]

59. Koby, F. Monographie des Polypiers jurassiques de la Suisse. 4e partie, Abh. schw. pal. Ges. xi. pp. 151–212; 5e partie, *op. cit.* xii. pp. 213–304, pls. lxiii.–lxxxviii.

60. Leidy, J. An Extinct Hydroid. Science, v. p. 395, with fig.

Haldemana primæva, a Graptolite in a quartzite pebble?, Lower Silurian.

61. Nicholson, H. A., & Etheridge, R. [Jun.]. On the Synonymy, Structure, and Geological Distribution of *Solenopora compacta*, Billings, sp. Geol. Mag. (3) ii. pp. 529–535, pl. xiii.

The authors are quite undecided as to the position of this fossil: it may prove to be a calcareous *Alga*.

62. Nicholson, H. A., & Foord, A. H. On the Genus *Fistulipora*, M'Coy, with Descriptions of several Species. Ann. N. H. (5) xvi. pp. 496–517, figs. 1–6, pls. xv.–xviii.

An interesting suggestion is made by Moseley & Howes in this paper that the well-marked groove which occurs along the calyx of the Monticuliporan fossil coral *Fistulipora*, indicates the presence of a siphonoglyphe.

63. Pocta, P. Ueber fossile Kalkelemente der Alcyoniden und Holothuriden und Verwandte recente Formen. SB. Ak. Wien, xcii. pp. 7–12, 1 pl.

64. Tomes, R. F. Observations on some imperfectly known *Madreporaria* from the Cretaceous Formation of England. Geol. Mag. (3) ii. pp. 541–553, pl. xiv.

65. ——. On *Madreporaria* from the Great Oolite of Oxford, Gloucester, and Somerset. Q. J. Geol. Soc. xli. pp. 170–190, pl. v.

Thamnocœnia and *Platastræa*, gg. nn.

66. ——. On some Imperfectly known *Madreporaria* from the Cretaceous Formation of England. *T. c.* P. of Soc. *cit.* [Abstr. p. 111, and Ann. N. H. (5) xvi. pp. 311 & 312.]

67. Vine, G. R. Notes on the *Polyzoa* and *Foraminifera* of the Cambridge Greensand. *T. c.* P. of Soc. *cit.* [Abstr. pp. 101 & 102, and Ann. N. H. (5) xvi. pp. 149 & 150.]

Morphology, Special and General.

Hydrozoa.

The most interesting new Cœlenterate described in the year is *Microhydra ryderi*, Potts; Ryder (46). A minute fresh-water Hydroid, .5 mm. × .15 to .175 mm. No tentacles or pedal disc. Asexual reproduction occurs by means of a lateral bud which becomes constricted off from the parent from above and below, so that it is attached by its side. Colonies of two individuals have been observed. The ectoderm is thin, and the nematocysts are mainly aggregated at the oral end. The endodermal cells are solid at the cleft-like mouth, then for about a third of the length of the animal they are large and vacuolated, but are again solid lower down. The upper third alone appears to be specially digestive. *Microhydra* is thus the simplest known Cœlenterate, being little more than a sessile planula. [*Cf.* Zool. Rec. xxi. *Cœl.* p. 9, for refs. to the Hydroid phase of *Limnocodium*, with which *Microhydra* agrees in many respects but with marked differences.]

Ussow (48) also describes a new form, and Viguier (51) gives some additional details of the anatomy of the remarkable Medusa, *Tetraplatia volitans*.

From an observation on *Sarsia tubulosa* (= *Syncoryne sarsii*) Haacke (19) regards the fundamental number of the quaternary *Medusæ*, at least of the *Craspedota*, to be causally conditioned by the lateral budding of the Medusa on the polyp.

Bedot (2–4) continues his researches on the discoid Siphonophores. Chun (7), Claus (8), and Fewkes (13) [see also Reproduction] recur to the cyclic development of *Siphonophora*.

Actinozoa.

Erdmann (10) gives some very interesting details concerning the anatomy of the *Zoantheæ*. These forms differ from all other *Actiniæ* in the fact that new septa can only be produced by the two interseptal processes which lie nearest to the ventral directive septa. He defines all the genera, *Zoanthus*, *Mammilifera*, *Epizoanthus*, *Palythoa*, and *Corticifera* belonging to the *Zoanthidæ*, and *Sphenopus* and one unnamed new genus (genus vii.) to the *Sphenopidæ*. Of the 13 spp. described, only *Palythoa axinella* is fully named, the others being referred to by numbers.

Faurot (11) has a note on the symbiosis of *Adamsia palliata* with *Eupagurus prideauxi*, and on a few points of its anatomy and development.

Fowler (16) commences his researches on the anatomy of the *Madreporaria* by an account of the structure of *Flabellum patagonichum* and *Rhodopsammia parallela*; he calls attention to and corroborates von Koch's discovery that the corallum is a product of the ectoderm, and deposited outside the embryo. This ectoderm persists in the adult as the layer of calycoblasts, to which the continual growth of the corallum is attributable. Attention is drawn to the probable taxonomic value of the relations of septa and tentacles to the mesenterial spaces.

Hubrecht (23) describes *Echinoptilum macintoshii*, g. & sp. nn., which

forms the type of a new family (*Echinoptilidæ*) of the *Pennatulidæ*, probably belonging to the section *Spicatæ*, subsection Junciformes. It is a small densely spiculate form, without any skeletal axis.

Physiology.

The chromatology of the *Actiniæ* has received considerable attention. Behrens (5) has a note on the subject; Klebs (24) reviews Graff's paper of last year [*cf.* Zool. Rec. xxi. *Cœl.* p. 2]. The most important observations are those of MacMunn (36), who states that various kinds of pigment occur in different species of *Actiniæ*. In the mesoderm of some species a green pigment occurs which gives all the reactions of biliverdin. A colouring matter resembling chlorofucin, but not identical with any animal or plant chlorophyll, is derived from the "yellow cells," and from them only, of certain *Actiniæ*. When "yellow cells" are present, there appears to be a suppression of those colouring matters which in other species are of respiratory value.

Romanes (45) has brought together his numerous and careful investigations upon the physiology of *Medusæ*; the results are too numerous to epitomize. The great difference in the behaviour of the *Hydromedusæ* and the *Scyphomedusæ*, when subjected to the same experiments, is very noticeable [*cf.* Götte, No. 17 & p. 8].

Reproduction.

A. Milnes Marshall (37) has a short paper on the morphology of the sexual organs of *Hydra*; and

Thallwitz (47) describes, with considerable detail, the development of the spermatozoa in Hydroids, and finds that the heads of the spermatozoa arise from the nuclei of the spermatoblasts, and not independently of them. He finds that the testis-epithelium is of ectodermal origin in many cases.

H. W. Conn, in a paper on "Marine Larvæ and their Relation to Adults" (Studies Biol. Lab. J. Hopkins Univ. iii. pp. 165–192, pls. viii. & ix.), argues for the Pilidium being an ancestral form of the Cœlenterates; the Hydroids and *Medusæ* can be reduced to an actinula. Figures are given of the actinula of *Porypha* and larval stages of *Cunina*.

Chun (7) has reinvestigated the difficult problem of the cyclic development of the *Siphonophora*, and maintains his previous general conclusions [*cf.* Zool. Rec. xx. *Cœl.* p. 2]:—(1) The cyclic development of *Monophyidæ*. (2) The relation of *Monophyidæ* to *Diphyidæ* and *Polyphyidæ*. (3) The *Eudoxia* groups of the Diphyids and their sexual relations. Chun proposes to reserve for *P. maxima* or *cymbiformis* the generic title *Praya*, and to erect the genus *Lilyopsis* (g. n.) for the three others, viz., *L. diphyes*, *L. medusa*, and *L. rosea*. Claus also (8) maintains his earlier views [*cf.* Zool. Rec. xx. *Cœl.* p. 2].

Fewkes (13), who is also attacking this question, distinguishes three stages in the metamorphosis of *Agalma elegans*: (1) the primitive

larva; (2) the Athorybia stage; (3) the larva like the adult, but possessing provisional structures. The present paper deals with the growth of the egg from fertilization to the primitive larva.

Götte (17) gives some interesting details of the development of *Aurelia* and *Cotylorhiza*, and comes to the following conclusions: (1) The cœlogastrula of these *Scyphomedusæ* is effected by the immigration of the endoderm into the cavity of the cœloblastula. (2) The *Scyphistoma* is a perfect Anthozoon, owing to the discovery by the author of the invagination of the ectodermal œsophagus and the occurrence of gastral sacs and septa surrounding it. (3) The *Ephyra*, and consequently the *Scyphomedusa*, is a metamorphosed *Scyphistoma*, or Anthozoon, just as the Hydroid *Medusa* is a metamorphosed Hydroid Polyp.

M'Intosh (35) states reasons for regarding *Cyanea lamarckii*, Pér. & Les., as an immature stage of *C. capillata*, Esch. No reason for the change of the deep blue of the former into the brown of the latter is suggested. [*Cf.* Zool. Rec. xxi. *Cœl.* p. 9.]

Metschnikoff (39) describes the early development of *Callianira bialata*, *Beroë forskalii*, and *B. ovata*. The gastrulation is at once embolic and epibolic, the plan of construction is regular, and the blastopore oral. The Ctenophores, alone of Cœlenterates, seem to have a mesoderm which appears as a definite layer in the embryo; so far as the author observed, the mesoderm arises from the endoderm alone, and not also from the ectoderm.

General Biology.

Dana (9) reviews the various theories which have been framed to account for the origin of coral reefs. The Darwinian theory and its evidences is restated, with additional proofs. The objections raised by Semper, Rein, John Murray, A. Agassiz, Geikie, and others, are severally met, and the conclusion is arrived at that "the subsidence which the Darwinian theory requires has not been opposed by the mention of any fact at variance with it, nor by setting aside Darwin's arguments in its favour; and it has found new support in the facts from the 'Challenger's' soundings off Tahiti that had been put in array against it, and strong corroboration in the facts from the West Indies." In his travels the author was made to see a system of arrangement in the Pacific Islands, to appreciate the vast length of the island chains with their many parallelisms, and the accordant relations subsisting between them and long lines of atolls. He was thence led to observe the corresponding system in the features of the continental lands. "Thus a conception of the earth as a unit became early implanted, and the idea also of its development as a unit under movements as comprehensive as the system in its feature lines."

H. O. Forbes (Naturalist's Wanderings in the Eastern Archipelago [London: 1885], p. 40) inclines to believe "that the Cocos-keeling reef foundation has arisen as Murray, Semper, and Agassiz have suggested; but that its islets have been the result of the combined action of storms and the slow elevation of the volcanically upheaved ocean floor, on which the reef is built."

There is a note in Nature, xxxii. p. 36, on the coral trade of the Mediterranean.

Greeff just alludes to a few pelagic Cœlenterates in his paper "Ueber die pelagische Fauna an den Küsten der Guinea-Inseln." Z. wiss. Zool. xlii. p. 432.

Methods.

Haacke, W. Ueber die Conservation der Medusen. Zool. Anz. viii. pp. 515 & 516.

Leuckart (Zool. Anz. viii. p. 333) and Lolley (Science, v. p. 227) allude to the beautifully conserved *Siphonophora* distributed from the Zoological Station, Naples.

Richard, J. Nouveau réactif de fixation des animaux inférieurs. Zool. Anz. viii. pp. 332 & 333 [recommending chlorhydrate of cocaïne.]

Genera and Species.

Hydrozoa.

Hydroids and *Medusæ*.

Campanularia carduella, sp. n., New Zealand, p. 132, *Sertularella margaritacea*, sp. n., Magellan, p. 133, *S. capillaris*, sp. n., New Zealand, p. 133, *S. crassipes*, sp. n., Cape, p. 133, *S. cuneata*, sp. n., Cape, p. 134, *S. limbata*, sp. n., Cape, p. 134, *S. trimucronata*, sp. n., Australia, p. 135, *S. trochocarpa*, sp. n., Bass's Strait, p. 135, *S. diffusa*, sp. n., Rockaway, p. 136, *Diphasia bipinnata*, sp. n., Cape ?, p. 136, *Synthecium ramosum*, sp. n., New Zealand, p. 137, *Sertularia aperta*, sp. n., Cape, p. 138, *S. minima*, D'A. W. Thomps., Cape, p. 138, *S. unilateralis*, sp. n., Australia and New Zealand, p. 139, *S. crinis*, sp. n., New Zealand, p. 139, *S. elongata*, Lamx., Tasmania, p. 140, *S. crinoidea*, sp. n., Cape, p. 141, *S. amplectens*, sp. n., Atlantic, p. 141, *S. megalocarpa*, sp. n., Australia ?, p. 142, *Demoscyphus orifissus*, sp. n., Bass's St., p. 143, *D. unguiculata*, Busk, Adelaide, p. 144, *Thuiaria interrupta*, sp. n., Australia, p. 145, *T. diaphana*, Busk, *in litt.*, sp. n., Queensland, p. 145, *T. ramosissima*, sp. n., N.E. America, p. 146, *T. hippisleyana*, sp. n., Australia, p. 146, *T. heteromorpha*, sp. n., Tasmania, p. 147, *Thecocladium flabellum*, g. & sp. nn., p. 149, *Aglaophenia chalarocarpa*, sp. n., Cape, p. 150, *A. perforata*, sp. n., St. Vincent Is., p. 150, *A. acutidentata*, sp. n., p. 151, *A. late carinata*, sp. n., Gulf of Mexico, p. 151, *A. dolichocarpa*, sp. n., Australia, p. 152, *Halicornaria mitrata*, sp. n., p. 153, *H. cornuta*, sp. n., p. 153, *Lytocarpus ramosus*, sp. n., Bass's St., p. 154, *Gattya humilis*, g. & sp. nn., p. 156, *Plumularia lagenifera*, sp. n., Vancouver's Is., p. 157, *P. multinoda*, sp. n., New Zealand, p. 157. All the above are figured. Allman (1).

Monosklera, g. n., p. 910, *M. pusilla*, sp. n., p. 911, pl. xl. figs. 1–3, *Lafoea cylindrica*, sp. n., p. 912, pl. xl. figs. 4 & 5, *Sertularia simplex*, sp. n., p. 913, *Diaphasia rectangularis*, sp. n., p. 914, pl. xli. figs. 6–8, *Pandæa minima*, sp. n., p. 916, pl. xlii. figs. 10–12, *Margelis trinema*, sp. n., p. 918, pl. xli. fig. 13, *Octorhopalon fertilis*, sp. n., p. 919, pl. xlii. figs. 14 & 15, *Eucope hyalina*, sp. n., p. 920, pl. xlii. figs. 16–18, *Campanulina*

calyculata var. *makrogona*, var. n., p. 922, from Australia and New Zealand; Von Lendenfeld (27). Some other species are described and figured.

Hydra hexactinella, sp. n., *id.* (33).

Wagner (53) alludes to the following: *Hydractinia echinata*, p. 69, *Oorhiza borealis*, p. 71, *Lizzia blandina*, p. 73, *Bougainvillea superciliaris*, p. 73, *Plotocnide borealis*, g. & sp. nn., p. 74, pl. iv. figs. 1 & 2, *Circe kamtschatica*, p. 75, *Sarsia tubulosa*, p. 76, & woodcut, p. 78, *Tiara pileata*, p. 78, *Ægionopsis laurentii*, p. 79, *Staurophora laciniata*, p. 80, *Aurelia aurita*, p. 81, *Cyanea arctica*, p. 83. All the above are from the Bay of Solowetzki.

Zygophylax profunda, g. & sp. nn., p. 4, pl. i. fig. 4, *Plumularia variabilis*, sp. n., p. 6, pl. ii. fig. 2, *P. annuligera*, sp. n., pp. 8 & 156, pl. ii. fig. 3, *Antennularia irregularis*, sp. n., p. 8, pl. ii. fig. 4, *A. profunda*, sp. n., p. 10, pl. ii. fig. 5, all from 500 fathoms, Cape Verde Is.; Quelch (42).

Tubularia indivisa, L., *T. rugosa*, D'Orb., *Aglaophenia philippina*, Kirch., *A. laxa*, Allm.; Ridley (44).

Microhydra ryderi, g. & sp. nn., Ryder (46).

Pennington describes as new: *Tubularia britannica*, sp. n., p. 75, pl. iii. fig. 8, *Sertularia argentella*, sp. n., p. 117, pl. viii. fig. 1, *Aglaophenia plumosa*, sp. n., p. 129, pl. x. fig. 1.

Lilyopsis, g. n., for *Praya diphyes*, *medusâ*, and *rosea*; Chun, (7) p. 7.

Polypodium hydriforme, g. & sp. nn., Ussow (48).

HYDROCORALLINÆ.

Distichopora conferta, sp. n., p. 15, pl. i. fig. 3, Raratonga, *D. ochracea*, sp. n., p. 19, pl. i. fig. 2, Solomon Is.: Quelch (42).

CTENOPHORA.

Bolina chuni, sp. n., Lendenfeld (29).

ACTINOZOA.

HEXACTINIA.

Minyas torpedo, sp. n., N.W. Australia, Bell (6).

Bell (6) advocates the merging of *Plotactis* and *Oceanactis* into *Minyas*, so that the *Minyadidæ* would consist at present of but two genera, *Minyas* and *Nautactis*.

Dendrophyllia sp. n., *Phyllangia papuensis*, Stud.; Ridley (44).

Desmophyllum crista-galli; *D. nobile*, sp. n., 300 fath., Nova Scotia, p. 150; *Epizoanthus abyssorum*, sp. n., 1555–2033 fath. [no description], p. 151: Verrill (50).

OCTACTINIA.

Benthoptillum sertum, g. & sp. nn., 991–1073 fath., p. 149; *Stylatula* sp.: Verrill (50).

Echinoptilum macintoshii, g. & sp. nn., Hubrecht (23).

SPONGIÆ.

BY

PROF. SOLLAS, LL.D., D.Sc., F.R.S.E.

LIST OF WORKS ON RECENT SPONGES.

1. CARTER, H. J. Note on *Spongilla fragilis*, Leidy, and a new species of *Spongilla* from Nova Scotia. Ann. N. H. (5) xv. p. 18. [*Spongilla mackayi.*]

2. ——. Descriptions of Sponges from the Neighbourhood of Port Phillip Heads, South Australia. *T. c.* pp. 107–117, pl. iv., 196–222, & 301–321; *op. cit.* xvi. pp. 277–294 & 347–368.

3. ——. Mode of Circulation in the *Spongida*. *T. c.* pp. 117–122, pl. iv. figs. 5 & 7.

4. ——. Report on a Collection of Marine Sponges from Japan, made by Dr. J. Anderson, F.R.S. *T. c.* pp. 387–406, pls. xii.–xiv.

5. ——. On a Variety of the Fresh-water Sponge, *Meyenia fluviatilis*. *T. c.* pp. 453–456.

6. FRISTEDT, K. Bidrag till kannedomen om de vid Sveriges vestra kust lefvande *Spongiæ*. Bih. Sv. Ak. Handl. xxi. No. 6, pp. 1–56, pls. i.–iv.

7. GOETTE, A. Ueber die Entwicklung der Spongien. Zool. Anz. viii. pp. 377–380.

8. HALL, J. Descriptions of the Fossil Reticulate Sponges constituting the Family *Dictyospongidæ*. Rep. N. Y. S. Mus. 1884, pp. 465–481, pls. xviii.–xxi.

9. HANSEN, G. A. *Spongiadæ*. The Norwegian North Atlantic Expedition, 1885, 4to, 24 pp., 7 pls. & 1 map.

10. KOEHLER, R. Remarques sur le genre "*Caminus*," et sur une éponge voisine du "*Caminus osculosus*," Grube. Bibl. haut. étud. xxix., Art. No. 4*bis*, 5 pp.

11. LENDENFELD, R. v. Das Nervensystem der Spongien. (Vorläufige Mittheilung.) Zool. Anz. viii. pp. 47–50, 2 woodcuts. [Abstr. in J. R. Micr. Soc. (2) v. pp. 253 & 254.]

12. [Lendenfeld, R. v.] Die Verwandtschaftsverhaltnisse der Kalkschwämme. *T. c.* pp. 211–215.

13. ——. Das Nervensystem der Spongien. (Berichtigung und Ergänzung.) *T. c.* p. 448.

14. ——. Zur Histologie der Spongien. *T. c.* pp. 466–469 & 483–486.

15. ——. Die Verwandtschaftsverhaltnisse der *Myxospongiæ*. *T. c.* p. 510.

16. ——. Beitrag zur Kenntniss des Nerven und Muskelsystems der Hornschwämme. SB. Ak. Berlin, 1885, p. 1015.

17. ——. The *Homocœla* of Australia and the New Family of *Homodermidæ*. P. Linn. Soc. N. S. W. ix. pp. 896–907.

18. ——. The Histology and Nervous System of Calcareous Sponges. *T. c.* pp. 977–983.

19. ——. A Monograph of the Australian Sponges. Part 3, The *Calcispongiæ*, *t. c.* pp. 1083–1150, pls. lix.–lxvii.; Part 4, The *Myxospongiæ*, *op. cit.* x. pp. 3–22, pls. i.–v.; Part 5, The *Aulenina*, *t. c.* pp. 282–325, pls. xxvi.–xxxv.; Part 6, The genus *Euspongia*, *t. c.* pp. 481–552, pls. xxxvi–xxxviii.

20. ——. The *Phoriospongiæ*. *Op. cit.* x. pp. 81–84.

21. ——. Notes on the Australian Sponges recently described by Carter. *T. c.* pp. 151–156. [Also in Ann. N. H. (5) xvi. pp. 20–25.]

22. ——. On a Sponge destructive of the Oyster Culture in the Clarence River. *T. c.* pp. 326–329.

23. ——. Addendum to the Monograph of the Australian Sponges. *T. c.* pp. 475 & 476.

24 Lockwood, S. *Heteromeyenia ryderi*, a Fresh-water Sponge. J. N. Y. Micr. Soc. i. pp. 37–40.

25. Marshall, W. Bemerkungen über die Cœlenteratennatur der Spongien. Jen. Z. Nat. xviii. pp. 868–880; trans. in Ann. N. H. (5) xvi. pp. 90–100.

26. Pocta, P. Beiträge zur Kenntniss der Spongien der böhmischen Kreideformation. Part 2, *Lithistidæ*. Abh. böhm. Ges. (6) xii. No. 9, 45 pp., 2 pls.

27. ——. Ueber Spongiennadeln des Brüsaner Hornsteines. SB. böhm. Ges. 1884 (1885), pp. 243–254, 2 pls.

28. Poléjaeff, N. Report on the Scientific Results of the Voyage of H.M.S. 'Challenger.' Report on the *Keratosa*. 1884, 4to, 85 pp., 10 pls.

29. Potts, E. On the Wide Distribution of some American Fresh-water Sponges. Ann. N. H. (5) xv. pp. 20–22; reprinted from P. Ac. Philad. 1884, p. 215 [*cf.* Zool. Rec. xxi. *Spong.* p. 3].

30. [Potts, E.] A New Fresh-water Sponge from Nova Scotia (*Heteromeyenia pictonensis*, sp. n.). P. Ac. Philad. 1885, pp. 28 & 29 ; Ann. N. H. (5) xv. pp. 425 & 426.

31. ——. A Fresh-water Sponge from Mexico (*Meyenia mexicana*, sp. n.). Am. Nat. xix. pp. 810 & 811.

32. ——. Fresh-water Sponges from Mexico. P. U. S. Nat. Mus. 1885, pp. 587–589.

33. Rice, H. J. Sponges. J. N. Y. Micr. Soc. i. pp. 116–122.

34. Ridley, S. O. The *Monaxonida*. Chall. Nar. i. pp. 569–573, figs. 187 & 188.

35. Schmidt, O. Entstehung neuer Arten durch Verfall und Schwund älterer Merkmale. Z. wiss. Zool. xlii. pp. 639–647, pl. xxiii.

36. Schulze, F. E. Ueber das Verwandtschaftsverhältniss der Spongien zu der Choanoflagellaten. SB. Ak. Berlin, 1885, pp. 179–191. [Trans. in Ann. N. H. (5) xv. pp. 365–377 ; extr. in Arch. Z. expér. (2) iii. pp. xliv.–xlvi.]

37. ——. Lebende Krusten von *Oscarella lobularis*, O. S., var. *cærulea*, aus Triest, mit in der Bildung begriffen und bereits abgestossen Brut-kapseln. SB. nat. Fr. 1885, pp. 183–185.

38. ——. The *Hexactinellida*. Chall. Nar. i. pp. 437–451, figs. 158–170.

39. Seely, H. M. A New Genus of Chazy Sponges, *Strephocetus*. Am. J. Sci. (3) xxx. pp. 355–357.

40. Sollas, W. J. Note on the Structure of the Skeleton in the *Anomocladina*. Ann. N. H. (5) xv. pp. 236–238.

41. ——. On *Vetulina stalactites* (O. S.), and the Skeleton of the *Anomocladina*. P. R. Irish Ac. (2) iv. pp. 486–492, pls. iii. & iv. [Abstr. in J. R. Micr. Soc. (2) v. p. 464.]

42. ——. On the Physical Characters of Calcareous and Siliceous Sponge Spicules and other Structures. P. R. Dubl. Soc. (n.s.) iv. pp. 374–392, pl. xv.

43. ——. On a Hexactinellid Sponge from the Gault, and a Lithistid from the Lias of England. *T. c.* pp. 443–446, pl. xxi.

44. ——. A Classification of the Sponges. Ann. N. H. (5) xvi. p. 395.

45. ——. The *Tetractinellida*. Chall. Nar. i. pp. 451 & 452.

46. Vejdovsky, F. Observations on some Fresh-water Sponges. Ann. N. H. (5) xv. pp. 14–18. [Translated by W. S. Dallas from SB. böhm. Ges. 1884 (*cf.* Zool. Rec. xxi. *Spong.* p. 4).]

47. Vosmaer, G. C. J. *Porifera*, pts. vii.–xi. Bronn's Klassen und Ordnungen, pp. 177–368, pls. xix.–xxv.

48. ——. Something about Scudder's Nomenclator Zoologicus. Zool. Anz. viii. pp. 216–218.

49. [Vosmaer, G. C. J.] The Sponges of the 'Wm. Barents' Expedition, 1880 and 1881. Bijdr. Dierk. xii., 47 pp., 5 pls.

50. Wierzejski, A. O Rozwoju Paków (*Gemmulæ*) gabek slodkowodnych, europejskich, tudziez o gat. *Spongilla fragilis*, Leidy (*S. sibirica*, Dyb.). Rozpraw i Spraw. wydz. matem.-przyr. Ak. Umiej. 1884.

51. Wrzesniowski, A. Stanowisko gabek w systematyce zwierat wedlug Marschala (Position of the Sponges in the Animal Kingdom, according to Marshall). Wszechswiat, 1885, iv. pp. 563 & 564.

52. Zahálka, C. Ueber *Isoraphinia texta*, Roem., sp., und *Scytalia pertusa*, Reuss., sp., aus der Umgebung von Raudnitz a. E. in Böhmen. SB. Ak. Wien, xcii. pp. 647–652, & pls.

Anatomy and Histology.

Lendenfeld (11, 13, 14, 16, 18, 19) describes nervous elements from several species of *Calcispongia* and *Ceratosa*. The sensitive cells are fusiform, with a central oval nucleus; they occur singly, or in clusters or rings, in the vicinity of incurrent apertures, lying at right angles to the outer epithelium, through which the distal end of each protrudes as a fine hair-like process or palpocil; the proximal end extends inwards as a long thread, which sometimes ramifies, and can occasionally be traced into connection with another cell which resembles a multipolar ganglion cell. These apparent ganglionic cells are sometimes situated between the sensitive cells and muscular sphincters.

In Bell's "Comparative Anatomy and Physiology" [London: 1885], p. 431, there is an account (and figure) of C. Stewart's observations on the sensitive elements of *Grantia raphanus*. These, which form a ring about the entrance to the incurrent canals, resemble stellate mesodermal cells, with one process always directed at right angles to the outer epithelium, which is raised immediately over it (as if to receive it) into a sharply pointed conical eminence.

Polejaeff (28) gives a full account of the anatomy and histology of the *Ceratosa*.

Lendenfeld (12–20) gives a full account of the anatomy and histology of the *Calcarea*, some *Myxospongia*, and a large number of *Ceratosa*. Amongst the *Calcarea*, a new genus, *Homoderma*, is described, combining the anatomy of a Sycon with the histology of an Ascon; amongst the *Myxospongiæ* a new genus, *Bajalus*, with Sycon-like flagellated chambers, is described.

Sollas (40 & 41) shews that Zittel in both his earlier and later views is mistaken as to the structure of the skeleton in the *Anomocladina*. It consists of sclerites having a massive centrum from which a variable number of rod-like rays proceed. These terminate in expanded ends, which embrace the centres of neighbouring sclerites, and so produce a firm network.

Sollas (42) finds the refractive index of siliceous spicules for light to be 1·449, nearly the same as that of opal (1·446). Calcareous spicules

consist of elongated rhombohedrons of calcite, with their optic axes similarly oriented through the entire spicule (and therefore not radially arranged with respect to the axial fibre). They have a sp. gr. of 2·62; refractive indexes, E. = 1·485, W. = 1·65.

O. Schmidt (35) admits the presence of tetractine spicules in *Caminus vulcani*, O. S., and traces a reduction in their numbers relative to the monaxon spicules through *Caminus osculosus*, Grube [= *Pachymatisma johnstoni*, Bk.—Rec.], and *C. vulcani*, O. S., up to complete disappearance in *C. apiarum*, O. S.

Ontogeny.

Goette (7), on the subject of the development of the gemmules and young sponge of *Spongilla lacustris*, contrasts the results obtained by Marshall and himself.

Phylogeny.

Schulze (36), in discussing the affinities of the Sponges, states that no other naturalist besides Kent has seen collared cells in the free-swimming sponge larva; and he suggests that Kent has mistaken for larvæ rolled-up portions of the flagellated endoderm of the adult Sponge. Schultze also points out that *Protospongia hæckeli* of Kent differs fundamentally in histological structure from a true Sponge. Its structureless matrix differs from gelatinous connective tissue in the absence of fixed connective tissue corpuscles; and it is not invested with a pavement epithelium, as is the connective jelly in Sponges. Moreover, the flagellated cells are immersed in it up to the collar, and not merely seated on it, as in Sponges. Schulze also argues against the views of Bütschli and Marshall, and concludes that the *Cnidaria* and Sponges are nearly related, that their divergence did not commence before the stage of ciliated larvæ, but how much later there is nothing at present to show.

Marshall (25) criticizes the opposing views of Schulze and Sollas, and endeavours to show that Sponges are degraded *Coelenterata*.

Classification.

Lendenfeld (12, 19) gives the following classification of the *Calcarea*:—

Order, Calcispongiæ. Suborder 1, Homocœla; suborder 2, Heterocœla.

Homocœla.

Fam. 1. *Asconidæ*. (Genera, *Ascetta*, *Ascaltis*, *Ascandra*.)

Fam. 2. *Homodermidæ*, new; *Homocœla* with radial tubes. (Genus, *Homoderma*, new.)

Fam. 3. *Leucopsidæ*, new; *Homocœla* with abundant mesoderm, in which mouthless ascon persons are imbedded; with a large pseudogaster and pseudostome. (Genus, *Leucopsis*, new.)

HETEROCŒLA.

Fam. 1. *Syconidæ.*

Subfam. 1. *Syconinæ.* *Syconidæ* with unbranched distally separate flagellated tubes, and without complicated canal system. (Genera, *Sycetta*, *Sycandra*.)

Subfam. 2. *Uteinæ.* *Syconidæ*, the simple unbranched flagellated tubes of which have coalesced throughout, so that there are no projecting distal cones, but a smooth continuous outer surface. No complicated canal system. (Genera, *Grantessa*, Ldf., *Ute*, O. S., *Sycortusa*, Ldf., *Amphoriscus*, H.)

Subfam. 3. *Grantinæ.* (Genera, *Grantia*, *Heteropegma*, *Anamixilla*.)

Fam. 2. *Sylleibeidæ*, new. *Heterocœla* with complicated exhalent canal system, connecting the sack-shaped cylindrical flagellated chambers with the gastric cavity.

Subfam. 1. *Vosmaerinæ.* Flagellated tubes all situated at the same distance from the main axis of the spongeperson, radially arranged ; a thick layer of reticulate exhalent canals intervenes between the flagellated chambers and the gastral cavity. The inhalent canals also form a reticulation. (Genus, *Vosmaeria* ; includes *Leucetta hackeliana*, Pol., and *L. imperfecta*, Pol.)

Subfam. 2. *Polejnæ.* Flagellated chamber-tubes arranged radiately to the exhalent canals, and therefore not equidistant from the axis of the sponge. Chamber layer not a simple cylinder, but extensively folded. (Genus, *Polejna* ; founded on *Leucilla uter*, Pol.)

Fam. 3. *Leuconidæ.* (Genera, *Leucetta*, *Leucaltis*, *Leucortis*, *Leucandra*.)

Fam. 4. *Teichonidæ.* (Genera, *Teichonella*, Crtr., *Eilhardia*, Pol.)

SCHULZE (38) gives the following classification of the *Hexactinellida* :— Type, *Cœlenterata* ; subtype, *Spongiæ*. Class, *Silicispongiæ* ; subclass, *Hexactinellida*.

Order I. LYSSACINA, Zittel.

Fam. 1. *Euplectellidæ.*

Subfam. 1. *Euplectellinæ* (*Euplectella*, Owen, *Regadrella*, O. S.).

Subfam. 2. *Holascinæ* (*Holascus*, g. n., *Malacosaccus*, g. n.).

Subfam. 3. *Tægerinæ* (*Tægeria*, g. n., *Walteria*, g. n., *Habrodictyum*, Wy.-Th., *Eudictyum*, Marshall, *Dictocalyx*, g. n., *Rhabdodictyum*, O. S., *Rhabdoplectella*, O. S., *Hertwigia*, O. S).

Fam. 2. *Asconematidæ.*

Subfam. 1. *Asconematinæ* (*Asconema*, S. Kent, *Aulascus*, g.n.).

Subfam. 2. *Sympagellinæ* (*Sympagella*, O. S.).

Subfam. 3. *Caulophacinæ* (*Caulophacus*, g. n., *Trachycaulus*, g. n.).

Fam. 3. *Hyalonematidæ*.

Subfam. 1. *Hyalonematinæ* (*Hyalonema*, Gray, *Dictyosphæra*, g. n., *Pheronema*, Leidy, *Poliopogon*, Wy.-Th.).

Subfam. 2. *Semperellinæ* (*Semperella*, Gray).

Fam. 4. *Rossellidæ*.

Subfam. 1. *Rossellinæ* (*Lanuginella*, O. S., *Polylophus*, g. n., *Rossella*, Carter, *Acanthascus*, g. n., *Bathydorus*, g. n.).

Subfam. 2. *Crateromorphinæ* (*Crateromorpha*, Gray, *Rhabdocalyptus*, g. n.).

Subfam. 3. *Aulochoninæ* (*Aulochonen*, g. n.).

Appendix. *Hyalostylus*, g. n., *Aulocalyx*, g. n.

Order II. DICTYONINA, Zittel.

Suborder I. UNCINATARIA.

Tribe 1. *Clavularia*.

Fam. 1. *Farreidæ* (*Farrea*, Bow.).

Tribe 2. *Scopularia*.

Fam. 1. *Euretidæ* (*Eurete*, Semper, *Periphragella*, Marshall, *Lefroyella*, Wy.-Th.).

Fam. 2. *Melittonidæ* (*Aphrocallistes*, Gray, *Melittaulus*, g. n.).

Fam. 3. *Chonelasmatidæ* (*Chonelasma*, g. n.).

Fam. 4. *Volvulinidæ* (*Volvulina*, O. S., *Tretodictyum*, g. n., *Fieldingia*, S. Kent).

Fam. 5. *Sclerothamnidæ* (*Sclerothamnus*, Marshall).

Suborder II. *Inermia*.

Fam. 1. *Myliusidæ* (*Myliusia*, Gray).

Fam. 2. *Dactylocalycidæ* (*Dactylocalyx*, Gray, *Scleroplegma*, O. S., ?*Margaritella*, O. S.).

Fam. 3. *Euryplegmatidæ* (*Euryplegma*, g. n., ? *Joanella*, O. S.).

Fam. 4. *Aulocystidæ* (*Aulocystis*, g. n., *Cystispongia*, Roemer).

LENDENFELD (15, 19) classifies the *Myxospongiæ* as follows :—

Order I. MYXINÆ. The mesoderm consists of soft transparent jelly destitute of fibrils or spicules ; rarely supported by distant fibres (*Halisarca*). Flagellated chambers in a surface layer ; interior lacunose, and without chambers.

Fam. 1. *Oscarellidæ*, new. With spherical flagellated chambers. (*Oscarella lobularis*.)

Fam. 2. *Halisarcidæ*, new. With sack-shaped elongated flagellated chambers. (Genera *Halisarca*, Johnst., and *Bajalus*, new).

Order II. GUMMINÆ. Mesoderm of characteristic structure, giving it an india-rubber-like consistency. With or without stellate spicules.

Fam. 1. *Chondrosidæ*.

Subfam. 1. *Chondrosinæ*, without stellates (genus *Chondrosia*, Nardo).

Subfam. 2. *Chondrissinæ*, with stellates (genus *Chondrilla*, O. S.).

Polejaeff (28), after a full discussion of the characters which are of systematic value in the classification of the *Keratosa*, adopts provisionally and with modifications Vosmaer's method. In the concluding part of the Report, however, he states it as his opinion that the *Keratosa* should form but one family, and by the adoption of subgenera he reduces the genera to the following:—(i.) *Ianthella*. (ii.) *Darwinella*. (iii.) *Simplicella* (with two subgenera *Aplysilla* and *Dendrilla*). (iv.) *Spongia* (including *Euspongia*, *Hippospongia*, *Cacospongia*, *Stelospongus*, and *Coscinoderma*). (v.) *Phyllospongus* (with provisional subgenera *Phyllospongia* and *Carteriospongia*). (vi.) *Spongelia* (with subgenera *Dysidea* and *Psammoclemma*). (vii.) *Psammopemma* (provisional). (viii.) *Velaria* (including *Aplysina*, *Verongia*, and *Luffaria*).

In the body of the work the following families and genera are adopted:—

Group Keratosa, Grant, 1861. Porifera with horny skeleton, devoid of proper spicules.

Fam. 1. *Darwinellidæ*, Merejowsky, 1878. *Keratosa* with large pouch-shaped flagellated chambers communicating by means of numerous pores in their walls with inhalent cavities, by means of one wide mouth with exhalent cavities; ground mass without granules, transparent; axis of fibres thick.

Fam. 2. *Spongelidæ*, F. E. Schulze, 1878. *Keratosa* with flagellated chambers of more or less regularly spherical outlines, communication with the canal system as in the *Darwinellidæ*; ground mass as in the *Darwinellidæ*; axis of fibre thin; fibres cored in most cases with foreign enclosures.

Fam. 3. *Spongidæ*. *Keratosa* with small hemispherical flagellated chambers, communicating by means of numerous pores with inhalent, by means of special canals with exhalent, cavities; axis of fibre thin; ground mass about the flagellated chambers granulated.

Fam. 4. *Aplysinidæ*, Vosmaer. *Keratosa* with small, either hemispherical or pear-shaped flagellated chambers, communicating with exhalent and inhalent cavities, each by means of one comparatively long and narrow inhalent and exhalent canaliculus; axis of fibres thick; ground mass about the flagellated chambers overloaded with granules.

Fam. *Darwinellidæ*.

1. *Ianthella*, Gray. The fibres of the skeleton contain true cells.

Fam. *Spongelidæ*.

1. *Spongelia*, Nardo. With large flagellated chambers; outer surface provided with conuli.
2. *Psammoclemma*, Marshall. With small flagellated chambers; external surface smooth.

3. *Psammopemma*, Marshall. Without differentiated skeletal fibres; skeleton afforded by foreign enclosures lying separately in the parenchyma, horny substance confined to a thin envelope around the enclosed foreign bodies.

Fam. *Spongidæ*.

1. *Coscinoderma*, Carter. Skeletal fibres admitting of no distinction into primary and secondary ones.
2. *Euspongia*, Bronn. With fine skeletal fibres, forming a compact network, the meshes being very small; primary and secondary fibres readily distinguishable.
3. *Hippospongia*, F. E. Schulze. With fine skeletal fibres and small meshes, the fibres admitting of no distinction into primary and secondary ones; distinguished by a system of canals permeating the body in all possible directions.
4. *Cacospongia*, O. Schmidt. With readily distinguishable primary and secondary skeletal fibres of comparatively thick diameter and forming comparatively large meshes.
5. *Stelospongus*, O. Schimdt. With comparatively thick skeletal fibres united in separated columns, directed more or less regularly, radiating from the basis of the sponge towards the outer surface, and consisting each of a compact network of vertical primary and horizontal secondary fibres.
6. *Carteriospongia*, Hyatt. Form flabellate, leaf-like, or funnel-shaped; skeletal fibres distinguishable into larger primary and smaller secondary ones; flagellated chambers devoid of any inhalent and exhalent canaliculi; with ribbed outer surface.

Fam. *Aplysinidæ*.

1. *Luffaria*, O. Schmidt. With thick-walled heterogenous skeletal fibres, their central part but little differentiated optically from the surrounding horny lamina.
2. *Verongia*, Bowerbank. The central axis of the thick-walled skeletal fibres readily distinguishable optically from the surrounding horny walls.

Lendenfeld (19) commences a classification of the Horny Sponges as follows:—

Order. Ceraospongiæ, Bronn. Sponges with a skeleton composed of horny fibre; siliceous (flesh) spicules, produced by the sponge itself, may occur in the mesoderm, but never in the horny fibres.

Suborder 1. Microcameræ. With small spherical flagellated chambers.

Fam. 1. *Spongidæ*, F. E. S. Flagellated chambers small, hemispherical to spherical, communicating with inhalent lacunæ by numerous pores, with exhalent canals and lacunæ by wide pores or canals; fibres forming a network; axis of fibres very thin; main fibres often containing foreign bodies; ground mass about the chambers containing granules.

Subfam. 1. *Auleninæ*.
Subfam. 2. *Spongininæ*.
The *Auleninæ* include the genera ‖ *Halme*, ‖ *Aphrodite*, *Aulena*, *Halmopsis*, all new.
The *Spongininæ* include the genus *Euspongiæ*, Broun, which is subdivided into seven subgenera.

SOLLAS (44) proposes the following classification of the Sponges :—
Class 1. *Plethospongiæ*. Class 2. *Calcispongiæ*.
The *Plethospongia* are subdivided into 3 sub-classes, *Hexactinellida*, *Demospongia*, and *Myxospongiæ* ; the *Demospongia* into the two tribes *Monaxonida* and *Tetractinellida* ; the *Monaxonida* into the orders *Monaxona* and *Ceratosa*; and the *Tetractinellida* into the orders *Choristida* and *Lithistida*.

VOSMAER (47) proposes the following classification of the Sponges :—

PORIFERA.

Class 1. *P. calcarea*. Class 2. *P. non-calcarea*.
Class 1. *P. calcarea*.
Order I. HYALOSPONGIÆ = *Hexactinellida*, autt.
Suborder I. DICTYONINA, Zittel.
Fam. 1, *Euretidæ*; 2, *Coscinoporidæ*; 3, *Millitionidæ* ; 4, *Ventriculitidæ* ; 5, *Staurodermidæ*; 6, *Meandrospongidæ* ; 7, *Callodictyonidæ*; 8, *Cœloptychidæ*.
Suborder II. LYSSAKINA, Zittel.
Fam. 1, *Receptaculitidæ* ; 2, *Monakidæ*; 3, *Pleionakidæ*; 4, *Pollakidæ*.
Order II. SPICULISPONGIÆ. Skeleton very seldom absent. Sclerites, when present, independent spicules, which, when they form a rigidly consistent skeleton, do so by the interlocking of peculiar tubercular outgrowths, but never by "soldering," as in the *Hyalospongiæ*. They are often united into a fibre by means of organic material.
Suborder I. LITHISTINA. [The further subvision of this group is according to Zittel.]
Suborder II. TETRACTINA.
Fam. 1. *Geodidæ*. (Genera, *Geodia*, Lmk., *Isops*, Soll., *Synops*, Vosm., *Pachymatisma*, Bwk., *Cydonium*, Fleming, *Caminus*, O. S.)
Fam. 2. *Ancorinidæ*. (Genera, *Stelletta*, O. S., *Papyrula*, O. S., *Ecionema*, Bwk., *Thenea*, Gray, *Dercitus*, Gray, *Agardiella*, Marshall, *Sphinctrella*, O. S., *Ancorina*, O. S., *Tribrachion*, Weltner, *Tethyopsis*, Stewart, *Tricentrium*, Ehlers, *Ophiraphidetes*, Carter ?, *Craniella*, O. S., *Tetilla*, O. S.)
Fam. 3. *Placinidæ*. (Genera, *Placina*, F. E. S., *Placortis*, F. E. S., *Placinastrella*, F. E. S.)
Fam. 4. *Corticidæ*. (Genus, *Corticium*, O. S.)

Suborder III. OLIGOSILICINA.

Fam. 1. *Chondrosidæ.* (Genera, *Chondrilla*, O. S., *Chondrosia*, Nardo.)

Fam. 2. *Halisarcidæ.* (Genera, *Oscarella*, Vosmaer, *Halisarca*, Dujardin.)

Suborder IV. PSEUDOTETRAXONIA.

Fam. 1. *Tethyidæ.* (Genera, *Tethya*, Lmk., *Tuberella*, Keller, *Aaptos*, Gray.)

Suborder V. CLAVULINA.

Fam. 1. *Polymastidæ.* (Genera, *Polymastia*, Bwk., *Weberella*, Vosm., *Tentorium*, Vosm., *Osculina*, O. S., *Papillella*, Vosm.)

Fam. 2. *Suberitidæ.* (Genera, *Quasillina*, Norm., *Stylocordyla*, W. T., *Rhizaxinella*, Keller, *Suberites*, Nardo, *Poterion*, Schlegel.)

Fam. 3. *Clionidæ*, provisional. (Genera, *Cliona*, Grant, *Pione*, Gray, *Myle*, Gray, *Sapline*, Gray, *Idomon*, Gray, *Jaspis*, Gray, *Pronax*, Gray, *Thoosa*, Hancock, *Euryphylla*, D. & M., ? *Samus*, Gray.)

Order III. CORNUCUSPONGIÆ. Skeleton consisting either of monaxon spicules, which are cemented together by more or less spongin, or only of spongin, with or without incorporated foreign bodies. Inhabitants of salt, brackish, and fresh water; chiefly at no great depths. Carboniferous to recent.

Suborder I. HALICHONDRINA.

Fam. 1. *Halichondridæ.* (Genera, *Halichondria*, Fleming, *Calyx*, Vosm., *Tedania*, Gray, *Foliolina*, O. S., *Petrosia*, Vosm., *Reniera*, O. S., *Metschnikowia*, Grimm., *Eumastia*, O. S., *Chalina*, Bwk., *Auletta*, O. S., *Dictyonella*, O. S., *Spinosella*, Vosm., *Pachychalina*, O. S., *Axinella*, O. S., *Pseudochalina*, O. S., *Cacochalina*, O. S., *Cladochalina*, O. S., *Sclerochalina*, O. S., *Rhizochalina*, O. S., *Acervochalina*, Ridley, *Acanthella*, O. S., *Toxochalina*, Ridley, *Cavochalina*, Crtr.)

Fam. 2. *Spongillidæ.* (Genera, *Spongilla*, Lmk., *Ephydatia*, Lmx., *Tubella*, Crtr., *Parmula*, Crtr., *Heteromeyenia*, Potts, *Lubomirskia*, Dyb., *Lessepsia*, Keller, *Uruguaya*, Crtr., *Potamolepis*, Marshall.)

Fam. 3. *Desmacidonidæ.* (Genera, *Gelliodes*, Ridley, *Myxilla*, O. S., *Hastatus*, Vosm., *Desmacidon*, Bwk., *Crambe*, Vosm., *Hamigera*, Gray, *Artemisina*, Vosm. ?, *Forcepina*, Vosm. ?, *Hamacantha*, Gray, *Vomerula*, O. S., *Iotrochota*, Ridley, *Melonanchora*, Crtr., *Guittarra*, Crtr., *Amphilectus*, Vosm., *Esperella*, Vosm., *Jophon*, Gray, *Cladorhiza*, Sars, *Chondrocladia*, W. T., *Sceptrella*, O. S., *Sclerilla*, O. S.)

Fam. 4. *Ectyonidæ*. (Genera, *Clathria*, O. S., *Ectyon*, Gray, *Echinodictyum*, Ridley, *Ophlitaspongia*, Bwk., *Plocamia*, O. S. ?, *Ectyonopsis*, Crtr. ?, *Echinonema*, Crtr. ?, *Agelas*, D. & M. ?, *Adocia*, Gray, *Amphimedon*, D. & M., *Crella*, Gray, *Pandaros*, D. & M., *Phorbas*, D. & M., *Terpios*, D. & M.) [Then follow a list of genera possibly belonging to the *Halichondriæ*, and another list of genera possibly belonging to the *Spiculispongiæ*.]

Suborder IV. CERATINA.

Fam. 1. *Spongelidæ*. (Genera, *Spongelia*, Nardo, *Psammoclema*, Marshall, *Psammopemma*, Marshall, *Velinea*, Vosm.)

Fam. 2. *Spongidæ*. (Genera, *Coscinoderma*, Crtr., *Euspongia*, Bronn, *Hippospongia*, F. E. S., *Cacospongia*, O. S., *Stelospongus*, O. S., *Carteriospongia*, Hyatt, *Phyllospongia*, Ehlers.)

Fam. 3. *Aplysinidæ*. (Genera, *Aplysina*, Ndo., *Verongia*, Bwk., *Luffaria*, D. & M.)

Fam. 4. *Darwinellidæ*. (Genera, *Darwinella*, F. Muller, *Aplysilla*, F. E. S., *Dendrilla*, Ldf., *Janthella*, Gray, *Dendrospongiæ*, Hyatt, *Taonura*, Crtr.)

O. SCHMIDT (35) admits that *Ancorina aaptos* is not to be regarded as a member of the *Tetractinellida*.

CARTER (2) divides the order *Psammonemata* (Carter) into the three families, *Bibulidæ*, *Hircinidæ*, and *Liochrotidæ*. A new family, *Arenida*, is instituted for the genera *Holopsamma*, *Sarcocornea*, and *Dysidea*. Families *Spongelida* and *Phyllospongida*, Hyatt, are also adopted, but both these and the *Arenida* appear to be subordinate divisions of the *Hircinidæ* and *Liochrotidæ*. In the order *Echinonema* (Carter), a new group (subfamily ?) *Higginsina* (p. 293), is instituted, and a new family, *Pseudoechinonemidæ* (p. 350).

NEW GENERA.

CARTER (2) institutes the following :—*Holopsamma*, p. 211, *Sarcocornea*, p. 214, *Geelongia*, p. 306, *Wilsonia*, p. 366.

LENDENFELD (19) describes the following new genera :—

(Myxospongiæ) *Bajalus*. *Halisarcidæ* with regular cylindrical, not ramified, elongate flagellated chambers ; p. 141.—(Calcarea) *Homoderma*. *Homodermidæ* which form colonies of several spindle-shaped persons ; the gastral cavities of which are connected with each other by a hollow spongorhiza ; p. 1088.—*Leucopsis*. *Leucopsidæ* without any canal system. The inhalent pores of the Ascon tube reticulation small, and in direct communication with the outer water. The exhalent pores large, and opening direct into the pseudogaster ; p. 1089.—*Grantessa*. *Uteinæ* with sparsely-scattered bunches of long dermal protruding acerates, which are not determined in their number or position by the flagellated tubes.

Sensitive cells in clusters on the inner side of the strictures which surround the inhalent pores; p. 1098.—*Vosmaeria*. *Vosmarinæ* with triradiate, quadriradiate, and acerate spicules. Sensitive cells in small irregularly scattered clusters on the surface; p. 1111.—*Polejna*. With the characters of the subfamily *Polejnæ*; p. 1115.

FRISTEDT (6) describes :—(Suberitinidæ) ‖ *Vosmaeria*, g. n., p. 24. Sponge incrusting, containing but little sarcode ; spicules of two kinds, spinulate and acerate.—(Desmacidinidæ) *Stylopus*, g. n., p. 28. Sponge incrusting ; spicules, ancorate, S- and C-shaped; cylindrical and spined acerates. Spined acerates of the interior lie parallel to one another and at right angles to the cylindrical spicules dispersed tangentially below the dermal membrane.

VOSMAER (49) describes (Desmacidinæ) *Artemisina*, g. n., p. 25.

NEW SPECIES AND SYNONYMY.

[Localities are given under the head of Distribution.]

MEGAMASTICTORA * (New Class).

CALCAREA.

LENDENFELD (19) describes the following new species :—*Ascetta procumbens*, sp. n., p. 1086, *A. macleayi*, sp. n., p. 1086 ; *Homoderma sycandra*, sp. n., p. 1088 ; *Leucopsis pedunculata*, sp. n., p. 1089 ; *Sycandra inconspicua*, sp. n., p. 1093, *S. ramsayi*, sp. n., p. 1097 ; *Grantessa sacca*, sp. n., p. 1098 ; *Vosmaeria gracilis*, sp. n., p. 1111 ; *Leucaltis helena*, sp. n., p. 1119 ; *Leucandra conica*, sp. n., p. 1126, *L. meandrina*, sp. n., p. 1129, *L. villosa*, sp. n., p. 1131, *L. vaginata*, sp. n., p. 1133.

MICROMASTICTORA (New Class ; = PLETHOSPONGIA).

MYXOSPONGIA.

LENDENFELD (19) describes the following :—*Bajalus laxus*, sp. n., p. 141 ; *Chondrosia ramsayi*, sp. n., p. 147 ; *Chondrilla secunda*, sp. n., p. 151, *C. papillata*, sp. n., p. 153, *C. corticata*, sp. n., p. 155.

CARTER (2) describes *Halisarca australiensis*, sp. n., p. 197. LENDENFELD (21) states that this is not a Sponge, but the ova and ovarian follicules of a *Boltenia*. *Chondrilla nucula*, O. S., described by Carter from Port Phillip, Australia, probably = *C. secunda*, Ldf.

MONAXONIDA.

(Ceratosa.) CARTER (2) describes the following :—*Geelongia vasiformis*, sp. n., p. 120 ; *Hircinia intertexta*, sp. n., p. 120 ; also *Luffaria digiiata*, sp. n., p. 203 ; *Aplysina lævis*, sp. n., p. 204 ; *Pseudoceratina durissima*, sp. n., p. 204 ; *P. crateriformis*, sp. n. (provisional), p. 205 ; *Holopsamma crassa*, g. & sp. nn., p. 211, *H. lævis*, sp. n., p. 212, *H. laminæ-favosa*, sp. n., p. 212, *H. fuliginosa*, sp. n., p. 213, *H. turbo*, sp. n.,

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* μαστικτωρ ὁ, the scourger : in reference to the comparatively large size of the collared cells.

p. 213; *Sarcocornea nodosa*, g. & sp. nn., p. 214; *Dysidea hirciniformis*, sp. n., p. 217, *D. chaliniformis*, sp. n., p. 217; *Spongelia stellidermata*, sp. n., p. 219; *Carteriospongia caliciformis*, sp. n., p. 221; *Stelospongus flabelliformis*, sp. n., p. 305, *S. tuberculatus*, sp. n. (provisional), p. 306; *Geelongia vasiformis*, g. & sp. nn., p. 306 (*cf.* No. 19); *Dactylia chaliniformis*, sp. n., p. 309, *D. impar*, sp. n., p. 309, *D. palmata*, sp. n., p. 310; *Hircinia solida*, sp. n., p. 310, *H. intertexta*, sp. n., p. 312 (*cf.* No. 19), *H. flabelliformis*, sp. n., p. 313, *H. communis*, sp. n., p. 314, *H. pulchra*, sp. n., p. 314; *Euspongia anfractuosa*, sp. n., p. 316; *Paraspongia laxa*, sp. n., p. 318. LENDENFELD (21) states that *Luffaria digitata*, Cr., = *Dendrilla rosea*, Ldf.; *Holopsammina*, Crt., = *Psammopemma*, Marshall; *H. crassa*, Cr., and *H. lævis*, Cr., = *P. densum*, Marshall. LENDENFELD (19) describes *Halme vesparum*, sp. n., = *Holopsamma laminæ-favosa*, Carter, p. 288, *H. simplex*, sp. n., p. 301, *H. globosa*, sp. n., p. 303, *H. micropora*, sp. n., p. 304; *Aphrodite nardorus*, sp. n., p. 306; *Aulena villosa*, sp. n., p. 309, *A. villosa auloplegma* and *A. villosa nardosus*, p. 318, *A. flabellum*, sp. n., p. 318, *A. nigra*, sp. n., p. 319; *Halmopsis australis*, sp. n., p. 320; *Euspongia irregularis*, sp. n., p. 485, with varr. *silicata*, *lutea*, *tenuis*, and *jacksonia*; *E. conifera*, sp. n., p. 500, *E. canaliculata*, sp. n., = *E. anfractuosa*, Carter, p. 502, with 3 varr., *dura*, *elastica*, and *mollissima*; *E. septosa*, Ridley, = *Spongia septosa*, Lmk., p. 519; *E. matthewsi*, R. v. L., = *Coscinoderma lanuginosum*, Carter, p. 520; *E. repens* = *Ditela repens*, Selenka, *E. compacta*, Carter, p. 527; *E. officinalis*, = *Ditela nitens*, O. S., = *Spongia adriatica*, O. S., = *S. agaricina*, Pallas, = *S. discus*, D. & M., = *S. graminea*, Hyatt, = *S. lapidescens*, D. & M., = *S. lignea*, Hyatt, = *S. mollissima*, O. S., = *S. quarnerensis*, O. S., = *S. vermiculatus*, D. & M., = *S. virgultosa*, O. S., *E. officinalis dura*, R. v. L., and *cavernosa*, Ridley, *E. bailyi*, sp. n., p. 535, *E. levis*, sp. n., p. 536, *E. parvula*, sp. n., p. 529, *E. reticulata*, sp. n., p. 541, *E. galea*, sp. n., p. 543, *E. foliacea*, Ridley, p. 544, *E. silicata*, sp. n., p. 545.

POLÉJAEFF (28) describes the following new species and variety :— (*Spongelidæ*) *Psammoclema rosmaeri*, p. 44, *P. foliaceum*, p. 45; *Psammopemma porosum*, p. 48; (*Spongidæ*) *Coscinoderma confragosum*, p. 50, *C. denticulatum*, p. 51, *C. altum*, p. 52; *Euspongia officinalis*, Linn., var. *lobosa*, p. 53; *Hippospongia anomala*, p. 54; *Cacospongia lævis*, p. 56, *C. amorpha*, p. 57, *C. murrayi*, p. 57, *C. vesiculifera*, p. 58, *C. procumbens*, p. 59, *C. dendroides*, p. 60, *C. spinifera*, p. 61, *C. tuberculata*, p. 61, *C. intermedia*, p. 62, *C. irregularis*, p. 63, *C. oligoceras*, p. 63, *C. compacta*, p. 64; (*Aplysinidæ*) *Luffaria variabilis*, p. 69.

(Monaxona.) CARTER (2) describes : *Esperia parasitica*, sp. n., p. 108; *Forcepia crassancorata*, sp. n., p. 111; *Halichondria scabida*, sp. n., p. 112; *Suberitis wilsoni*, sp. n., p. 113; *Acanthella cactiformis*, sp. n., p. 114; *Chalina polychotoma* var. *trichotoma*, v. n., p. 115. Also *Spongia polychotoma*, Esper, = *Halichondria oculata*, Johnst., = *Chalina oculata*, Bwk., = *Chalina polychotoma*, Crtr., p. 283; *Chalina polychotoma* var. n. *compressa*, var. n. *oculata*, var. n. *robusta*, var. n. *angulata*, var. n. *moniliformis*, pp. 284 & 285; *Patuloscula procumbens*, Crtr., var. n. *flabelliformis*, p. 286; *Textiliforma foliata*, sp. n., p. 288; *Echino-*

clathria favus, sp. n., p. 292, and var. *arenifera*, n., p. 350 ; *Echinonema flabelliformis*, sp. n., p. 352, *E. cæspitosa*, sp. n., p. 352, *E. pectiniformis*, sp. n., p. 353, *E. incrustans*, sp. n., p. 353 ; *Dictylocylindrus pinnatifidus*, sp. n., p. 353, *D. cacticutis*, sp. n., p. 354, *D. piniformis*, sp. n., p. 354 ; *Echinoclathria tenuis*, sp. n., p. 355, *E. nodosa*, sp. n., p. 356, *E. subhispida*, sp. n., p. 356, *E. gracilis*, sp. n., p. 356 ; *Higginsia coralloides*, Higgins, var. *natalensis*, n., p. 293, and var. *massalis*, n., p. 357 ; *H. lunata*, sp. n. (provisional), p. 358 ; *Axinella chilinoides*, sp. n., p. 358, and var. *glutinosa*, n., p. 359, *A. setacea*, sp. n., p. 359, *A. atropurpurea*, sp. n., p. 359, *A. stelliderma*, sp. n., p. 360, and var. *acerata*, n., p. 360, *A. villosa*, sp. n., p. 361, *A. flabellata*, sp. n., p. 361, *A. pilifera*, sp. n., p. 362, *A. meloniformis*, sp. n., p. 362, *A. solida*, sp. n., p. 362 ; *Phakellia flabellata*, sp. n., p. 363, *P. crassa*, sp. n., p. 363, *P. brassica*, sp. n., p. 363 ; *Acanthella hirciniopsis*, sp. n., p. 364, *A. parviconulata*, sp. n., p. 365, *A. rugolineata*, sp. n., p. 365 ; *Wilsonella australiensis*, sp. n., p. 366 ; *Plumohalichondria arenacea*, sp. n., p. 367, *P. mammillata*, sp. n., p. 355. Also (4) *Chalina polychotoma* var. *mauritiana*, var. n., p. 402 ; *Tuba poculum*, sp. n., p. 403.

Hansen (9) describes *Reniera simplex*, sp. n., p. 2, *R. oblonga*, sp. n., p. 3, *R. velamentosa*, sp. n., p. 3, *R. tubulosa*, sp. n., p. 3, *R. membranacea*, sp. n., p. 3, *R. digitata*, sp. n., p. 4, *R. nivea*, sp. n., p. 4, *R. palescens*, sp. n., p. 5, *R. dubia*, sp. n., p. 5, *R. infundibuliformis*, sp. n., p. 5, *R. complicata*, sp. n., p. 6, *R. inflata*, sp. n., p. 6 ; *Suberites alveus*, sp. n., p. 9, *S. conica*, sp. n., p. 10, *S. incrustans*, sp. n., p. 10, *S. radians*, sp. n., p. 10, *S. glabra*, sp. n., p. 11 ; *Myxilla exigua*, sp. n., p. 11, *M. grisea*, sp. n., p. 12, *M. brunnea*, sp. n., p. 12, *M. flabelliformis*, sp. n., p. 12 ; *Sclerilla arctica*, sp. n., p. 12, *S. dura*, sp. n., p. 13 ; *Desmacidon clavatum*, sp. n., p. 14, *D. nucleus*, sp. n., p. 14, *D. giganteum*, sp. n., p. 14, *D. arcticum*, sp. n., p. 15.

Vosmaer (49) describes *Stylocordyla borealis*, Lov., = *Hyalonema longissimum*, Sars, = *Polymastia stipitata*, Crtr., p. 10 ; *Polymastia mamillaris*, Mull., = *P. penicillus*, Vosm., p. 14 ; *Polymastia capitata*, sp. n., p. 16 ; *Weberella bursa*, sp. n., p. 16 ; *Quasillina brevis*, Bwk., = *Bursalina muta*, O. S., p. 20 ; *Forcipina bulbosa* = *Halichondria forcipis*, Bk., = *H. forcipis* var. *bulbosa*, Crtr., p. 21 ; *Phakellia bowerbankii*, sp. n., vars. α & β, p. 24, *P. arctica*, sp. n., p. 24 ; *Acanthella multiformis*, sp. n., p. 25 ; *Artemisina suberitoides*, g. & sp. nn., p. 25 ; *Myxilla barentsi*, sp. n., p. 27 ; *Hamacantha papillata*, sp. n., p. 28 ; *Gellius arcoferus*, sp. n., p. 29, *G. infundibuliformis*, sp. n., p. 29.

Carter (1), *Spongilla mackayi*, sp. n. ; also (5) *Meyenia fluviatilis* var. *angustibirotula* var. n., p. 454. Lockwood (24), *Heteromeyenia ryderi*, sp. n. Potts (30), *H. pictonensis*, sp. n. ; (32), *H. mexicana*, sp. n.

Tetractinellida.

Choristida.

Vosmaer (49), *Stelletta fortis*, sp. n., p. 6. *Craniella mülleri*, sp. n., = *C. cranium*, autt., p. 6.

Hansen (9), *Geodia parva*, sp. n., p. 16.

CARTER (4), *Pachastrella stellettodes*, sp. n., p. 403.

O. SCHMIDT (35). *Thenea fenestrata*, O. S., is to be regarded as a variety of *T. muricata*, Bk.

DISTRIBUTION.

RIDLEY (34) states that Monaxonid Sponges were obtained by the 'Challenger' at 31 stations of depths below 100 fath., 17 stations of depths from 100–200 fath., 11 stations of depths from 200–1000 fath., 5 stations of from 1000–2000 fath., 7 stations of from 2000–2600 fath., 1 station of 2900 fath., and 1 station of 3000 fath.

Europe. FRISTEDT (6) describes from the coast of Sweden (Gullmare and Bahusia) the following: (*Calcispongiæ*) *Ascetta coriacea*, Mont., 25 mètres; *Ascandra botryoides*, E. & S., various depths; *Sycandra coronata*, E. & S., various depths, and var. *spinispiculum*, Crtr., *S. glabra*, O. S., 23–70 mètres. (*Suberitinidæ*) *Vioa ciliata*, Grant, Bahusia, various depths, *V. vastifica*, Hanc.; *Polymastia mammillaris*, 100–140 mètres; *Radiella spinularia*, Bwk., various depths; *Thecophora semisuberites*, O. S., 100–140 mètres; *Suberites spermatozoon*, O. S., 70 mètres, *S. montalbidus*, Crtr., 75 mètres, *S. ficus*, Esper, *S. virgultosus*, Johnst., *S. massa*, Nardo, 35–60 mètres, *S. griffithsii*, Bwk., 36 mètres, *S. sulphureus*, Bwk.; *Hymeraphia stellifera*, Bwk., 125 mètres; *Vosmaeria crustacea*, sp. n., 54–125 mètres. (*Renierina*) *Amorphina panicea*, Pallas, *A. fallax*, Bwk.?, 35–55 mètres; *Reniera cinerea*, Grant, 45 mètres. (*Desmacidinæ*) *Stylopus coriaceus*, sp. n., 60 mètres; *Desmacella pumicea*, sp. n., 65 mètres, *D. peachii*, Bk., var. *stellifera*, n., 150–175 mètres; *Hastatus ambiguus*, Bk., 55–150 mètres, *H. mammillaris*, sp. n., 55 mètres, *H. robertsoni*, Bk., *H. granulatus*, Bk., 55–160 mètres, *H. fragilis*, Bk., 180 mètres; *Esperia forcipis*, Bk., 55–140 mètres, *E. armata*, Bk., 75 mètres, ? *E. peachii*, Bk., 160–180 mètres, *E. hyndmani*, Bk., 54 mètres, *E. nigricans*, Bk., 135 mètres, *E. lingua*, Bk., 135–180 mètres, *E. foliata*, sp. n., 70–180 mètres, *E. normani*, Bk. (*Geodinidæ*) *Geodia barretti*, Bk., 180 mètres. (*Chalinopsinidæ*) *Isodictya infundibuliformis*, L., 70–145 mètres; *Phakellia ventilabrum*, L., 140–180 mètres, *P. robusta*, Bk., 180 mètres; *Axinella rugosa*, Bk., 140 mètres; *Raspailia abyssorum*, Crtr., 180 mètres. (*Chalineæ*) *Chalina limbata*, Mont., 25 mètres, *C. pulcherrima*, sp. n., 175 mètres, ? *C. arbuscula*, Verrill. (*Ceraospongiæ*) *Dysidea fragilis*, Mont., 70–80 mètres.

North Atlantic and Arctic Ocean. HANSEN (9) describes from various stations between Norway, Spitzbergen, Greenland, and Iceland, the following: *Stylocordyle boreale*, Lovén, 412–1215 fath., T. – 1·0° to – 1·2° C.; *Reniera simplex*, sp. n., 341 fath., T. 6·5° C., *R. oblonga*, sp. n., *R. relamentosa*, sp. n., 148 fath., T. 1·9° C., *R. tubulosa*, sp. n., 1189 fath., T. 6·6° C., *R. membranacea*, sp. n., *R. digitata*, sp. n., 127 fath., T. 3·5° C., *R. nivea*, sp. n., *R. pallescens*, sp. n., 200 fath., T. 6·6° C., *R. dubia*, sp. n., 136 fath., 0·0° C., *R. infundibuliformis*, sp. n., *R. complicata*, sp. n., *R. inflata*, sp. n.; *Radiella sol*, O. S., 127–223 fath., 1·5° to 3·5° C.; *Rinalda uberrima*, O. S.; *Thecophora semisuberites*, O. S., 160–1287 fath., T. – 1·2° C. to 3·9° C.; *Polymastia penecillus*, Vosm.; *Suberites alveus*,

sp. n., 1287 fath., T. – 1·2° C., *S. conica*, sp. n., *S. incrustans*, 155 fath., T. 6·9° C., *S. radians*, sp. n., *S. glabra*, sp. n.; *Myxilla exigua*, sp. n., *M. grisea*, sp. n., *M. brunnea*, sp. n., 147 fath., T. 0·4° C., *M. flabelliformis*, sp. n., 416 fath., T. 0·8° C.; *Sclerilla arctica*, sp. n., 147–200 fath., T. 0·4 to 6·6° C., *S. dura*, sp. n., 341 fath., T. 6·5° C.; *Desmacidon clavatum*, sp. n., 1163 fath., T. – 1·1° C., *D. nucleus*, sp. n., 299 fath., T. – 0·3° C., *D. giganteum*, sp. n., *D. arcticum*, sp. n., 452 fath., T. – 1·0° C.; *Esperia bihamatifera*, Crtr., 148 fath., T. – 1·4° C.; *Cladorhiza abyssicola*, M. Sars, 416–1215 fath., T. 0·8° to – 1·2° C.; *Geodia parva*, sp. n.; *Pachymatisma johnstonia*, Bwk., 416 fath., T. 0·8° C.; *Tethya cranium*, Lmk., 223–323 fath., T. 1·5° to 6·6° C., *T. cranium* var. *infrequens*, Crtr., 447 fath., T. – 0·8°; *Thenea muricata*, Bwk., 148–1333 fath., T. – 1·6° to 6·6° C.; *Clavellomorpha minimum*, sp. n. (= *Thenea muricata*.—Rec.), 1200 fath., T. – 1·6° C.; *Hyalonema arcticum*, sp. n., 1081 fath., T. – 1·0° C.; *Ascetta primordialis*, H., 147–1081 fath., T. 1·0° to 0·4° C., *A. blanca*, H.; *Leucandra egedii*, ? H., 1200 fath., T. – 1·6° C.; *Sycandra arcticum*, H., in the Saltstrom, 90 fath., also 767–1215 fath., T. – 1·2° to – 1·4° C., *S. raphanus*, H., 1081 fath., T. – 1·0°.

Vosmaer (49) describes from various stations in the Arctic Ocean, between lat. 70° 40′ N. to 77° 7′ N., and long. 15° 46′ E. to 53° 41′ E., Bot. Temp., varying from – 1·3° to 2·4 C.: *Thenea muricata*, Bwk., 140–180 fath.; *Stelletta fortis*, sp. n., 179 fath.; *Craniella mulleri*, Vosm., = *C. cranium*, autt., 140–165 fath.; *Tetilla polyura*, 140–170 fath.; *Synops pyriformis*, Vosm., 180 fath.; *Geodia barretti*, Bwk., 155–177 fath.; *Tethya lyncurium*, Lmk., 145 fath.; *Stylocordyla borealis*, Wyv. Thoms., 140–165 fath.; *Polymastia hemispherica*, Sars, 140–165 fath., *P. mamillaris*, Bwk., 120–170 fath., *P. capitata*, sp. n., 165 fath.; *Weberella bursa*, sp. n., 140–155 fath.; *Thecaphora semisuberites*, O. S., 128–140 fath; *Quasillina brevis*, Bwk., 140–165 fath.; *Tedania suctoria*, O. S., 112–180 fath.; *Cribrochalina sluiteri*, Vosm., 37–170 fath.; *Auletta elegans*, Vosm., 170 fath.; *Phakellia ventilabrum*, Bwk., 165 fath., *P. bowerbankii*, sp. n., var. α, 140 fath., var. β, 155 fath., *P. arctica*, sp. n., 140–165 fath.; *Acanthella multiformis*, sp. n., 140–165 fath.; *Artemisina suberitoides*, sp. n., 140 fath.; *Forcipina bulbosa*, Crtr., 140 fath.; *Myxilla barentsi*, sp. n.; *Hamacantha papillata*, sp. n., 145–180 fath.; *Gellius vagabandus*, O. S., 140–165 fath., *G. arcoferus*, sp. n., 140–170 fath., *G. infundibuliformis*, sp. n., 140–180 fath.; *Esperia lingua*, Bwk., 140–175 fath., *E. lucifera* ?, O. S., 68–140 fath.; *Alebion piceum*, Vosm., 145–170 fath.; *Melonaucora elliptica*, Crtr., 140–145 fath.; *Spongelia avara*, O. S., 165 fath. Polejaeff (28) *Coscinoderma confragosum* and *Cacospongia procumbens*, spp. nn., from Portugal.

Islands of the Atlantic Ocean. Polejaeff (28): *Verongia hirsuta*, Hyatt, Bermudas, in shallow water; *Coscinoderma altum*, sp. n., Tristan da Cunha, 60 fath.

North America. *Psammopemma densum*, Marsh., Nova Scotia, 83 fath., Polejaeff (28); *Spongilla mackayi*, sp. n., Nova Scotia, Carter (1); *Meyenia fluviatilis* var. *angustibirotula*, sp. n., Carter (5); *Hetero-*

meyenia pictonensis, sp. n., Nova Scotia, POTTS (30); *Meyenia mexicana*, Mexico, POTTS (31); *M. plumosa* var. *palmeri*, n., Colorado River, POTTS (32).

South America. POLÉJAEFF (28): *Cacospongia levis*, sp. n., *Stelospongus longispinus*, D. & M., *Verongia tenuissima*, Hyatt, Barre Grande, 400 fath.; *Spongelia pallescens*, O. Schimdt, *Psammopemma porosum*, sp. n., *Euspongia officinalis*, Linn., var. *lobosa*, var. n., *Cacospongia amorpha*, *C. compacta*, spp. nn., Bahia, shallow water.

North Pacific. POLÉJAEFF (28): *Cacospongia dendroides. C oligoceras*, spp. nn., Philippine Is., 18 fath.; *C. collectrix*, F. E. S., Philippine Is., 12–20 fath., and Japan, 8 fath.

Oceana. POLÉJAEFF (28): *Hippospongia mauritiana*, Hyatt, *Cacospongia spinifera*, *C. intermedia*, *Luffaria variabilis*, spp. nn., New Hebrides, 60–70 fath., and Tahiti, shallow water; *Carteriospongia radiata*, Hyatt, Wednesday I., shallow water; *C. otahitica*, Esper, Admiralty Is., shallow water.

Australia, East Coast of. LENDENFELD (19) describes the following:—(Calcarea) *Ascetta procumbens*, *A. macleayi*, laminarian zone, *Homoderma sycandra*, *Leucopsis pedunculata*, *Sycandra ramsayi*, black mud, 10 fath., *Grantessa sacca*, 5–10 fath., *Leucaltis helena*, *Leucandra conica*, *L. meandrina*, *L. villosa*, *L. vaginata*, spp. nn.; *Amphoriscus cylindrus*, L., = *Sycilla cylindrus*, H.; *Grantia lobata*, L., = *Sycandra compressa* var. *lobata*, H.; *Leucetta microrhaphis*, L., = *L. primigenica* var. *microrhaphis*, H.; *Leucandra typica*, L, = *Leuconia typica* var. *tuba*, Pol.; *L. saccharata*, H. (Myxospongiæ) *Chondrosia ramsayi*, 10–20 mètres, on stones; *Chondrilla papillata*, *C. corticata*, spp. nn., *C. australiensis*, Crtr. POLÉJAEFF (28): *Psammoclema ramosum*, Marsh., *P. foliaceum*, *Cacospongia tuberculata*, spp. nn., Bass's Strait, 38–40 fath.; *Spongelia spinifera*, F. E. S., *Psammopemma densum*, Marsh., *Cacospongia vesiculifera*, sp. n., Port Jackson, 7 fath., and *Cacospongia murrayi*, sp. n., Port Jackson, 30–35 fath.; *Ianthella flabelliformis*, Pallas, *Cacospongia irregularis*, sp. n., Torres Straits, 28 fath., and *Spongelia horrida*, Selenka, *Psammoclema vosmaeri*, *Hippospongia anomala*, spp. nn., Torres Straits, 8 fath. LENDENFELD (21) describes from Torres Straits:—*Polejna uter* = *Leucilla ater*, Pol.

South Australia. LENDENFELD (19) describes from the South Coast of Australia, chiefly Port Phillip:—(Calcarea) *Ascetta procumbens*, *Homoderma sycandra*, spp. nn., *Sycandra arborea*, H., *Leucetta microrhaphis*, L., = *L. primigenia* var. *microrhaphis*, H. (Myxospongiæ) *Bajalus laxus*, sp. n.

CARTER (2) also from Port Phillip describes *Esperia parasitica*, sp. n.; *Forcipia colonensis*, Crtr., 19 fath., *F. crassancorata* (Port Elliot); *Halichondria scabida*, *Suberites wilsoni*, 19 fath., *Acanthella cactiformis*, spp. nn., 19 fath.; *Chalina polychotoma* var. *trichotoma*, var. n., 19 fath.; *Halisarca australiensis*, sp. n., 20 fath.; *Chondrilla nucula*, O. S.; (Ceratosa) *Luffaria digitata*, 20 fath.; *Darwinella australiensis*, 19 fath.; *Aplysina lævis*; *Pseudoceratina durissima*, 19 fath., *P. crateriformis*; *Holopsamma crassa*, depth variable, under 20 fath., *H. lævis*, 20 fath. and under, *H. laminafarosa*, 20 fath. and under, *H. fuliginosa*, sp. n., *H.*

turbo, sp. n., 18 fath., *Sarcocornea nodosa*, sp. n.; *Dysidea kirkii*, Bk., depth variable, *D. hirciniformis*, 19 fath., *D. chaliniformis*, 19 fath., *Spongelia stellidermata*, 3 fath., *Carteriospongia caliciformis*, spp. nn.; *Stelospongus levis*, Hyatt, 19 fath., *S. flabelliformis*, *S. tuberculatus*, 18 fath., *Geelongia vasiformis*, 20 fath, *Dactylia chalmiformis*, 19 fath., *D. impar*, 6 fath., *D. palmata*, 16 fath., *Hircinia solida*, 20 fath., *H. intertexta*, 18 fath., *H. flabellopalmata*, *H. pulchra*, spp. nn., 19 fath.

Japan. Carter (4) describes (Hexactinellida) *Farrea occa*, Bk., *Periphragella elisæ*, Marshall, *Hexactinella* (g. n.?) *ventilabrum*, sp. n.; (Lithistida) *Racodiscula asteroides*, Crtr.; (Choristida) *Pachastrella stellettodes*, sp. n.; *Pachastrella* sp.; (Monaxona) *Chalina polychotoma* var. *mauritiana*, var. n.; *Tuba lineata* var. *flabelliformis*, D. & M., *T. poculum*, sp. n.: all from off Misaki, Bay of Tokio. *Euspongia anfractuosa*, sp. n., 19 fath.; *Coscinoderma lanuginosum*, Carter, 19 fath.; *Paraspongia laxa*, sp. n.

New Zealand. (Calcarea) *Sycandra inconspicua*, sp. n., *Leucandra bomba*, H., both from the East Coast; Lendenfeld (19).

Fossil Sponges.

Various Fossil Sponges are described by Hall (8), Pocta (26, 28), Seeley (39), Sollas (43), Zahálka (52).

Methods.

Sollas (41) describes a method of isolating the sclerites of Lithistids by boiling with caustic potash; of obtaining sections of the Lithistid skeleton; and (42) various methods of studying the characters of siliceous and calcareous spicules.

PROTOZOA.

BY

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1. ARCHER, W. Presumed new Heliozoon discovered by Mr. Bolton near Birmingham ; remarks on a new Rhizopod exhibited before the Dublin Micr. Club [*Archerina boltoni*]. Ann. N. H. (5) xvi. pp. 142, 143, & 145.

2. BALKWILL, F. P., & WRIGHT, W. Report on some recent *Foraminifera* found off the Coast of Dublin and in the Irish Sea. Tr. R. Irish Ac. xxviii. (Sci.) pp. 317–372, pls. xii.–xiv.

3. BLANC, H. New *Rhizopoda* of the deep-water Fauna of the Lake of Geneva. Ann. N. H. (5) xv. p. 427. [Zool. Rec. xxi. *Prot.* p. 1.]

4. ——. Note on *Ceratium hirundella* (O. F. Müller) ; its Variability and Mode of Reproduction. Ann. N. H. (5) xvi. pp. 444-453, pl. xii. figs. 4–9. [Zool. Rec. xxi. *Prot.* pp. 1 & 15.]

5. BLANCHARD, R. Sur un nouveau type de Sarcosporidies. C.R. c. pp. 1599-1601. [Abstr. J. R. Micr. Soc. (2) v. p. 820.]

6. ——. Note sûr les Sarcosporidies, et sur un essai de classification de ces Sporozoaires. Bull. Soc. Z. Fr. x. pp. 244–276, pl. iii. figs. 1–5. [Abstr. J. R. Micr. Soc. (2) vi. p. 265.]

7. ——. Sur un Infusoire péritriche ectoparasite des poissons d'eau douce. *T. c.* pp. 277–280, pl. iii. figs. 6–9. [Abstr. J. R. Micr. Soc. (2) vi. pp. 260 & 261.]

7A. BRANDT, K. Die koloniebildenden Radiolarien (Sphærozoëen) des Golfes von Neapel und der angrenzenden Meeres-abschnitte. Fauna und Flora des Golfes von Neapel, XIII. Monographie. Berlin : 1885, 275 pp., pls. i.–viii.

A valuable monograph, giving an account of the morphology, biology, development, reproduction, and systematic of the colonial Radiolarians.

8. BRAUER, A. *Bursaria truncatella* unter Berücksichtigung anderer Heterotrichen und der Vorticellinen. Jen. Z. Nat. xix. pp. 489–519, pl. vi. [Abstr. J. R. Micr. Soc. (2) vi. pp. 459 & 460.]

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9. Burch, G. J. Supposed new Infusorian. J. Quek. Club, ii. pp. 163 & 164. [Abstr. J. R. Micr. Soc. (2) v. pp. 1015 & 1016.]

If new, to be called *Harpakter socialis*, g. & sp. nn.

10. Bütschli, O. *Protozoa* in H. G. Bronn's Klassen und Ordnungen des Thier-reichs, pts. 28–34, pl. lv.

11. ——. Kleine Beiträge zur Kenntniss einiger mariner Rhizopoden. Morph. JB. xi. pp. 78–101, pls. vi. & vii. [Abstr. J. R. Micr. Soc. (2) v. pp. 1016 & 1017.]

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13. ——, & Askenasy, E. Einige Bemerkungen über gewisse Organisations-verhältnisse der sog. Cilioflagellaten und der *Noctiluca*. Morph. JB. x. pp. 529–577, pls. xxvi.–xxviii., 4 figs. [Abstr. J. R. Micr. Soc. (2) vi. pp. 460–462.]

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38. ——. Ueber künstliche Teilung bei Infusorien. *T. c.* pp. 717–722 ; *op. cit.* v. pp. 137–141. [Abstr. *t. c.* pp. 472 & 658, and Naturforscher, xviii. p. 204.]

39. Haeckel, E. Ueber das System der Acantharien. Jen. Z. Nat. xix. Suppl. pp. 168–172.

A sketch of a classification of certain *Radiolaria*.

40. ——. Kólestwo pierwotniaków [The Kingdom of the *Protista*]. Warsaw : 1885, 8vo, 96 pp.

41. Hallez, P. Sur un Rhizopode nouveau (*Arcyothrix balbianii*). Bull. Sci. Nord, vii.–viii. pp. 323–325 ; Mém. Soc. Sc. Lille (4) xiv. 1 pl. [Abstr. Ann. N. H. (5) xvii. p. 539, and J. R. Micr. Soc. (2) vi. p. 263.]

42. Halliburton, W. D. Note on the Chemical Composition of the Zoocytium of *Ophrydium versatile*. Q. J. Micr. Sci. (n.s.) xxv. pp. 445–447. [Abstr. J. R. Micr. Soc. (2) v. p. 818.]

43. Harker, A. On the Zoocytium or Gelatinous Matrix of *Ophrydium versatile*. Rep. Brit. Ass. 1885 (1886), pp. 1074 & 1075.

44. Hertwig, R. Ist *Erythropsis agilis* eine losgerissene *Spastostyla sertulariarum*? Zool. Anz. viii. pp. 108–112 [*cf.* Zool. Rec. xxi. *Prot.* p. 16]. [Abstr. J. R. Micr. Soc. (2) v. pp. 255 & 256. (See Nos. 67 & 92.)]

45. Hogg, J. Indestructible Infusorial Life. J. R. Micr. Soc. (2) pp. 39 & 40. [Abstr. from 'The Times,' Jan. 4, p. 4 ; also *cf.* Engl. Mech. xl. pp. 430 & 452 ; Am. Nat. xix. p. 717.]

46. Imhof, O. E. Weitere Mittheilung über die pelagische und Tiefseefauna der Süsswasserbecken. Zool. Anz. viii. pp. 160–163.

47. ——. Notiz bezüglich der *Difflugia cratera*, Leidy. *T. c.* pp. 293 & 294.

48. Julien, A. A. Phosphorescent Flagellate Infusorian. Tr. New York Ac. Sci. v. pp. 15 & 16. [Abstr. J. R. Micr. Soc. (2) vi. pp. 462 & 463.]

49. Kellicott, D. S. Un Infusoire peu commun de la Famille des Vorticelliens. J. Microgr. ix. pp. 14–19, 2 figs. [On *Epistylis ophidioidea* ; *cf.* Zool. Rec. xxi. *Prot.* pp. 4 & 16.]

50. ——. *Opercularia constricta*, sp. n. Am. Micr. J. p. 121 and fig.

51. ——. Fresh-water *Infusoria*. P. Am. Micr. Soc. viii. pp. 38–47, 1 pl. [Abstr. J. R. Micr. Soc. (2) vi. pp. 634 & 635.]

52. Kent, W. Saville. Notes on the Infusorial Parasites of the Tasmanian White Ant. Ann. N. H. (5) xv. pp. 450–453. [*Cf.* Zool. Rec. xxi. *Prot.* pp. 4 & 16.] [Abstr. *op. cit.* v. p. 662. (*Cf.* No. 35.)]

53. Klebs, G. Ueber die Organisation und die systematische Stellung der Peridineen. Biol. Centralbl. iv. pp. 705–710.

Klebs regards the *Peridiniæ*, with *Exuviaella* and *Prorocentrum*, as related to the yellow algæ of *Radiolaria*.

54. Künstler, J. Sur un être nouveau, le *Bacterioidomonas undulans*. C.R. c. pp. 371 & 372 ; J. Microgr. ix. pp. 92 & 93, pl. iv. figs. 31 & 32.

55. ——. De la position systématique des Bactériacées. J. Microgr. ix. pp. 248–258 & 295–307, pl. iv.

56. ——. Pseudopodes et Cils vibratiles. *T. c.* pp. 343–350, fig. 14.

57. [Künstler, J.] *Dumontia opheliarum*, type nouveau de la sous-classe des Sarcodines. Bull. Soc. Z. Fr. x. pp. 309–336, pl. iv. [Abstr J. R. Micr. Soc. (2) vi. p. 265.]

58. Lankester, E. R. *Archerina boltoni*, g. & sp. nn., a Chlorophyllogenous Protozoon, allied to *Vampyrella*, Cienk. Q. J. Micr. Sci. xxv. pp. 61–73. pl. vii.

59. ——. *Protozoa*. Encycl. Brit. (9) xix. pp. 830–866, 26 figs.

60. ——. Bütschli's *Protozoa*. Nature, xxxii. pp. 145 & 146.

Notice of Bütschli's monograph [*cf.* Zool. Rec. xx. & xxi.].

61. Lendenfeld, R. von. The Australian Fresh-water *Rhizopoda*, pt. i. P. Linn. Soc. N. S. W. x. pp. 723–725.

62. ——. *Amœba parasitica*, a new Protozoan infesting Sheep. *T. c.* pp. 35–38, pl. vi. [Abstr. J. R. Micr. Soc. (2) v. p. 1018.]

Von Lendenfeld has investigated some Australian sheep affected by a disease which appears to be very similar to epithelial cancer. He believes that it is due to the presence of a parasitic *Amœba*, which he names *A. parasitica*.

63. Lockwood, S. Pseudo-cyclosis. Am. Micr. J. vi. pp. 46 & 47. [Abstr. J. R. Micr. Soc. (2) v. p. 663. (*Cf.* No. 93.)]

64. Maupas, E. Sur *Coleps hirtus*, Ehrenberg. Arch. Z. exper. (2) iii. pp. 337–368, pl. xvii. [Abstr. *t. c.* p. 1015.]

65. ——. Sur le glycogène chez les Infusoires ciliés. C.R. ci. pp. 1504–1506. [*Cf. op. cit.* cii. (1886) pp. 120–123.]

66. Mégnin, M. P. Sur le rôle pathogénique des certaines Psorospermies. Bull. Soc. Z. Fr. x. pp. 351 & 352, woodcut. [Abstr. J. R. Micr. Soc. (2) vi. pp. 265 & 266.]

Mégnin finds that certain external tumours which cause the death of Barbels infected with them are due to the presence of a Psorosperm which he describes but does not name.

67. Metschnikoff, E. Zur Streitfage über *Erythropsis agilis*. Zool. Anz. viii. pp. 433 & 434.

Metschnikoff described in 1874, from Madeira, a form allied to *Erythropsis agilis*, which at the time he believed to be allied to the *Acinetæ*. He supports the unicellular nature of the organism, and of the eye. [*Cf.* Zool. Rec. xxi. *Prot.* p. 16. (See also Nos. 44 & 92.)]

68. Millett, F. W. Recent *Foraminifera* of Mount's Bay. Plymouth: 1885, 8vo.

69. Möbius, K. *Freia ampulla*, das Flaschenthierchen. Schr. nat. Ver. Schleswig, vi. pp. 54 & 55; transl. Ann. N. H. (5) xvi. pp. 154 & 155. [Abstr. J. R. Micr. Soc. (2) v. p. 818.]

70. ——. Drei Arbeiten über Foraminiferen. Biol. Centralbl. iv. pp. 645–650.

Review of monographs by Goës, Sv. Ak. Handl. xix. No. 4, 1882, pp. 1–151, pls. i.–xii. [not previously noticed in the Zool. Rec.];

Carpenter [*cf.* Zool. Rec. xx. *Prot.* 'Challenger']; Brady [*cf. op. cit Prot.* xxi. p. 2.]

71. Montgomery, E. Ueber das Protoplasma einiger Elementarorganismen. Jen. Z. Nat. xviii. pp. 677-712, pl. xxi.

Plate, chiefly figures of *Infusoria*.

72. Normand, A. Sur la présence constante de l'*Amœba coli* dans les mucosités dysentériques. C.R. ci. p. 696.

73. Pfitzner, W. Zur Kenntniss der Kerntheilung der Protozoen. Morph. JB. xi. pp. 454–467, pl. xxvi. [Abstr. J. R. Micr. Soc. (2) v. pp. 258–260.]

Pfitzner gives numerous figures of the karyokinetic division of the nuclei of *Opalina ranarum*, and his methods of preparation.

74. Pouchet, G. D'un œil véritable chez les Protozoaires. C.R. Soc. Biol. (7) No. 36.

75. ——. Contribution à l'histoire des Péridiniens. J. Anat. Phys. xxi. pp. 28–88 & 525–534, pls. ii.–iv. & xxvi. [Abstr. J. R. Micr. Soc. (2) v. pp. 469 & 470; *op. cit.* vi. p. 261.]

76. Ruschhaupt, G. Beitrag zur Entwicklungsgeschichte der monocystiden Gregarinen aus dem Testiculus des *Lumbriculus agricola*. Jen. Z. Nat. xviii. pp. 713–750, pl. xxii. [Abstr. *op. cit.* v. p. 665.]

77. Schneider, A. Sur l'*Anoplophrya circulans*. C.R. c. pp. 1552 & 1553. [Abstr. J. R. Micr. Soc. (2) v. p. 819. *Cf.* Zool. Rec. xxi. *Prot.* pp. 1 & 16.]

78. Stokes, A. C. Some New *Infusoria* from American Fresh Waters. Ann. N. H. (5) xv. pp. 437–449, pl. xv. [Abstr. J. R. Micr. Soc. (2) v. p. 659.]

79. ——. Some apparently undescribed *Infusoria* from Fresh Water. Am. Nat. xix. pp. 18–27, 8 figs. [Transl. in full, J. Microgr. ix. pp. 78–86, 8 figs. Abstr., *t. c.* p. 257.]

80. ——. Some New *Infusoria*. Am. Nat. xix. pp. 433–443, figs. 1–10.

81. ——. Another *Vorticella* with two Contractile Vesicles. *T. c.* p. 510. [*V. monilata*, Tatem.]

82. ——. Notes on some apparently undescribed Forms of Fresh-water *Infusoria*. No. II. Am. J. Sci. (3) pp. 313–328, pl. iii. [Abstr. J. R. Micr. Soc. (2) v. p. 660.]

83. ——. A new Symbiotic Infusorian. J. N. Y. Micr. Soc. i. pp. 152–154, with fig. (*Leucophrys emarginata*). [Abstr. *op. cit.* vi. p. 84.]

84. ——. Notices of New Fresh-water *Infusoria*. IV. Am. Micr. J. vi. pp. 183–190, 14 figs. [Abstr. *t. c.* p. 85.]

85. ——. New *Choano-Flagellata*. Am. Micr. J. vi. pp. 8–12, 7 figs. [Abstr. *op. cit.* v. p. 258.]

86. ——. Notices of New Fresh-water *Infusoria*. III. *T. c.* pp. 121–127, 9 figs.

87. [Stokes, A. C.] Another *Vorticella* with two Contractile Vesicles (*V. monilata*, Tatem). Am. Micr. J. vi. pp. 52 & 53. [Abstr. J. R. Micr. Soc. (2) v. p. 659.]

88. ——. Key to the *Vorticellæ*. Microscope Ann Arbor, U. S. A. [Transl. (Clef des Vorticelles) in J. Microgr. ix. pp. 201–205.]

89. ——. New *Vorticellæ*. The Microscope, v. p. 36, 2 figs. [Abstr. J. R. Micr. Soc. (2) v. pp. 470 & 471.] [*Vorticella rhabdophora*, sp. n.]

90. Terquem, O. & E. La rade de Smyrne. Bull. Soc. Z. Fr. pp. 547–550.

Notice of some *Foraminifera*.

91. Vayssière, A. Note sur un Infusoire parasite de la *Truncatella truncatula*. J. de Conch. pp. 32–34, pl. xiii. figs. 19*a*, *b*, & 20. [*Cf.* C.R. ci. p. 577. Transl. in Ann. N. H. (5) xvi. p. 398.] [*Scyphidia fischeri*, sp. n.]

92. Vogt, C. Ueber *Erythropsis agilis*, Rich. Hertwig. Zool. Anz. viii. p. 53. [See Nos. 44 & 67.]

93. Wallich, G. C. The Pseudocyclosis in *Amœba*. Am. Micr. J. vi. pp. 190 & 193. [*Cf.* No. 63.]

94. ——. Critical Observations on Prof. Leidy's "Freshwater Rhizopods of North America," and Classification of the Rhizopods in general. Ann. N. H. (5) xvi. pp. 317–334 & 453–473.

95. ——. Critical Notes on Dr. Augustus Gruber's "Contributions to the Knowledge of the *Amœbæ*." *T. c.* pp. 215–227.

96. Weismann, A. Zur Frage nach der Unsterblichkeit der Einzelligen. Biol. Centralbl. iv. pp. 650–665 & 677–691. [Abstr. J. R. Micr. Soc. (2) v. pp. 466 & 467. *Cf.* J. Sci. vii. pp. 204 & 205.]

97. Witlaczil, E. *Neozygites aphidis*, eine neue Gregarinide. Arch. mikr. Anat. xxiv. pp. 599–603, pl. xxvii. B. [Abstr. *t. c.* p. 471.]

98. Woodward, A. *Foraminifera* from Bermuda. J. N. Y. Micr. Soc. i. pp. 147–151.

99. Zacharias, O. Experimentelle Untersuchungen über Pseudopodien-Bildung. Biol. Centralbl. v. pp. 259–262. [Abstr. J. R. Micr. Soc. (2) v. pp. 1014 & 1015.]

100. ——. Studien über die Fauna des Grossen und Kleinen Teiches im Riesengebirge. Z. wiss. Zool. xli. pp. 483–516.

A few fresh-water *Protozoa* are mentioned.

Palæontological.

101. Hauer, M. Das *Eozoon canadense*, eine microgeologische Studie. Leipzig: 55 pp. 18 pls.

102. Howchin, W. Occurrence of a Deep-Sea Foraminifer in Australian Miocene Rocks. Am. Nat. xix. p. 1092.

Astrorhiza angulosa, a rare N. Atlantic Arenaceous Foram, has been found by Howchin in the Miocene strata of Victoria.

103. Munier-Chalmas, —, & Schlumberger, C. Note sur les Miliolidées trématophorées. Bull. Soc. géol. (3) xiii. pp. 273–323, pls. xiii. & xiv., 44 figs. [Abstr. C.R. c. pp. 818 & 819.]

104. Pantanelli, D. Radiolarie negli schisti silicei di Monte Catini in Val di Cecina. Atti Soc. Tosc. (p.-v.) iv. pp. 168–170.

105. Rüst, —. Ueber fossile Radiolarien aus Schichten des Jura. Jen. Z. Nat. xviii. pp. 40–44.

General Anatomy and Physiology.

Bütschli (10) continues his account of the structure of the *Flagellata*.

Bütschli (11) describes and figures the nuclei of *Peneroplis*, *Orbitolites*, *Lagena*, *Textularia*, *Spirillina*, *Calcarina*, *Amphistegina*. The body substance or plasma has a finely reticulated structure. He finds parasitic yellow cells (*Zooxanthella*) in the plasma of *Peneroplis planatus*, *P. pertusus*, and *Orbitolites complanata*.

Lankester (58) describes a new minute Moneron, *Archerina boltoni*. No contractile vacuole is present; chlorophyll corpuscles, which multiply by quaternary division, occur and appear to functionally replace the nucleus; there are numerous delicate, stiff, filamentous, non-streaming pseudopodia; food is engulphed by lobate pseudopodia. A spiny encysted stage occurs. [*Cf.* also Archer (1).]

Gruber (37) gives more particulars concerning the multinucleate condition of many *Protozoa*. He finds that nucleoli may be absent, and that before division there is a fusion of the nuclei. The number of nuclei in *Amœba* is irrespective of division. In another paper (38), on the artificial division of *Infusoria*, from experiments on *Stentor* he draws the conclusions that cell-protoplasm can only produce its like, and can never give rise to nuclear protoplasm; pieces without a nucleus did well, but never grew up into complete animals. If an individual be incompletely divided, even a thread-like connecting strand is sufficient to cause the pieces to act as one physiological individual; thus nervous function is not restricted to certain tracts, but is generally diffused throughout the protoplasm. In a *Volvox* colony the bridges of protoplasm serve more for nervous correlation than for the mutual nourishment of the separated organisms. [*Cf.* also Zool. Rec. xxi. *Prot.* pp. 5 & 9, and No. 17.]

Wallich (95) reprints extracts from Leidy, Martin Duncan, and his own works, to prove that he had anticipated Gruber in some of his observations, and that the latter has not acknowledged it. He also criticizes Gruber's remarks as to pressure being the cause of the movement of granular particles, &c., in the body-substance of *Amœbæ*.

After some general remarks on Rhizopods, Wallich (94) criticizes at great length Leidy's treatment of the genus *Difflugia*.

Folin (30) describes a branching, tubular, submembranous marine Rhizopod belonging to the *Pseudarkysiæ*, on which he founds the new genus *Amphiexis*. He also makes a new genus, *Lithozoa*, for a Rhizopod having a pebble-like test formed of a porcellanous paste, including foreign particles.

Künstler (57) describes a remarkable Rhizopod, *Dumontia opheliarum*, g. & sp. nn., parasitic within the body cavity of various species of the Polychæte *Ophelia*. The naked protoplasmic body is usually bilobed and produced into band-like pseudopodia. The denser endoplasm contains a cylindrical cuticular (chitinous) elongated tube which appears to enclose the nucleus. Reproduction occurs by the budding off of small vesicles from the axial tube, and finally the whole body breaks up into fragments, of which each possesses a bud from the axis. Künstler regards this anomalous Protozoon as allied to the *Radiolaria* and *Foraminifera*.

The construction of the shells of the Milioline *Foraminifera* is the subject of an important memoir by Munier-Chalmas and Schlumberger (103). These authors warn us that *Foraminifera*, externally similar, may differ considerably in their internal architecture : for example, *Biloculina bulloïdes*, d'Orb., from the Eocene of Paris, has nothing in common with the analogous living species; hence it is rash to assume the identity of Cretaceous and recent forms. After describing the symmetry of construction, the subject of dimorphism is treated. They find that each species is represented by two forms (A and B), which only differ internally; the form B is always recognizable by a very much smaller initial chamber (microsphere), followed or surrounded by more numerous chambers than in the corresponding form A. What they term "initial polymorphism" is sometimes met with in the form A, and occurs in the post-embryonic period in the grouping of the first chambers, which take a bilocular, trilocular, or quinquelocular arrangement round the megasphere; this is freely illustrated for *Idalina antiqua* (d'Orb.). *Peribolina zitelli*, g. & sp. nn. (p. 309), and *Lacazina compressa* (d'Orb.), are also fully described.

Künstler (56) reviews the article by Zacharias (99) on the artificial production of very vibratile pseudopodia, recalling cilia or flagella. The latter concludes that the Flagellates are directly descended from the amœbiform Rhizopods. Although Künstler believes Zacharias' phenomena to be abnormal, he considers cilia to be fine constant pseudopodia, but these organs are separated by a long evolution, and the bonds which unite them are perhaps less direct than appearances would lead us to believe.

Barfurth confirms (pp. 314–321) the presence, and gives a figure (pl. xvi. fig. 13) of glycogen in *Opalina ranarum* ; Arch. mikr. Anat. xxv.

Bütschli (12) confirms his previous investigations on glycogen (or paraglycogen) in *Gregarinæ*, which were recently called into question by Frenzel (34) ; he also finds a glycogenous substance in the *Infusoria*, *Nyctotherus ovalis* and *Strombidium*.

By three experiments Maupas (65) proves that true glycogen occurs in *Paramæcium aurelia*, confirming the discovery of Certes [*cf.* Zool. Rec. xvi. *Prot.* p. 3].

The presence of two contractile vacuoles has hitherto only been found in those *Vorticellæ* which possess some form of cuticular investment or of surface ornamentation. These species are *V. lockwoodii*, Stokes, *V. monilata*, Tatem, *V. vestita*, Stokes, and *V. rhabdophora*, Stokes. Stokes (81).

Halliburton (42) finds that the zoocytium of *Ophrydium versatile* is composed of cellulose, and resembles tunicin (the substance of which the test of the *Tunicata* is composed) in being difficult to convert into dextrose. *Ophrydium* also possesses chlorophyll. Harker (43) also has a paper on the same subject; his results are chiefly negative.

After discussing the intermutability of *Bacillus subtilis* and *B. anthracis*, Dallinger (18) describes and figures a new septic organism; to this Monad, with six flagella, no name is given. Reproduction occurs in the ordinary manner by fission, the strand of protoplasm connecting the dividing organisms splitting into three of the flagella, and by spore-formation after conjugation. The thermal death-point is higher than for any known form, *i.e.*, 146° F. for the adult, and 190° F. for the spores. References to other forms are also made.

During the conjugation of *Anoplophrya circulans*, Balb., Schneider (77) finds that the nucleus of one Infusorian extends, in a rod-like manner, into the other, the two nuclei appearing as two parallel transverse cords; after conjugation fusion occurs between the two new nuclei in each individual. The exchange of nucleoli was not observed.

Foulke (31) describes the production of germs in *Chilomonas paramæcium*.

Schultze discusses the "Relationship of the Sponges to the *Choanoflagellata*" [SB. Ak. Berl. 1885, pp. 179–191; transl. Ann. N. H. (5) xv. pp. 365–377], and decides against the descent of the former from the latter, and in favour of the common ancestry of the sponges and *Cnidaria*.

A more or less detailed account of various *Protozoa* will be found in the following works:—Éléments de Zoologie, P. Bert & R. Blanchard (Paris: Masson); Elementary Text-Book of Zoology, C. Claus (Marburg and Leipzig: Elwert), and transl. A. Sedgwick (London: Swan, Sonnenschein & Co.); Éléments de Zoologie, H. P. Gervais (Paris: Hachette & Co.); Cassell's Concise Natural History, E. P. Wright (London); Atlas of Practical Elementary Biology, G. B. Howes (London: Macmillan); Elementi di Zoologia descrittiva, F. Bassani (Milano) G. B. Garneri (Torino); Traité de Zoologie médicale, R. Blanchard (Paris: Baillière).

Methods, &c.

The methods employed by Cattaneo [Zool. Rec. xx. *Prot.* p. 5] and Klebs [*t. c.* p. 8] are abstracted in the J. R. Micr. Soc. (2) v. pp. 538 & 539, and on p. 729 Brass's methods are given.

Certes (15, 16) gives a valuable résumé of the different effects of various staining reagents on living *Infusoria*, and points out that a new

field is thereby opened out for the study of the physiology of these and other *Protozoa*, as well as of Rotifers, &c.

Castellarnau (14) has collected, from various sources, the most approved methods of investigating living and dead *Protozoa*, and gives directions for mounting the same.

Pfitzner (73) describes how best to observe the karyokinetic nuclear division in *Opalina ranarum*.

Classification.

Lankester (59) has done on a small scale for English readers what Bütschli (10) is doing for those who read German, and, in the compass of a comparatively short article, has given a luminous account of the affinities, morphology, physiology, and taxonomy of the *Protozoa*. The following scheme of classification is adopted:—

PROTOZOA.

Grade A. *GYMNOMYXIA*.

Sections.	
Proteana	Class I. Proteomyxa. Ex., *Vampyrella*, *Protomyxa*, *Archerina*.
Plasmodiata	Class II. Mycetozoa. Ex., The *Eu-Mycetozoa* of Zopf.
Lobosa	Class III. Lobosa. Ex., *Amœba*, *Arcella*, *Pelomyxa*.
Filosa	Class IV. Labyrinthulidea. Ex., *Labyrinthula*, *Chlamydomyxa*.
	Class V. Heliozoa. Ex., *Actinophrys*, *Raphidiophrys*, *Clathrulina*.
	Class VI. Reticularia. Ex., *Gromia*, *Lituola*, *Astrorhiza*, *Globigerina*.
	Class VII. Radiolaria. Ex., *Thalassicolla*, *Eucyrtidium*, *Acanthometra*.

Grade B. *CORTICATA*.

Lipostoma	Class I. Sporozoa. Ex., *Gregarina*, *Coccidium*.
Stomatophora	Class II. Flagellata. Ex., *Monas*, *Salpingœca*, *Euglena*, *Volvox*.
	Class III. Dinoflagellata. Ex., *Prorocentrum*, *Ceratium*.
	Class IV. Rhynchoflagellata. Ex., *Noctiluca*.
	Class V. Ciliata. Ex., *Vorticella*, *Paramœcium*, *Stentor*.
	Class IV. Acinetaria. Ex., *Acineta*, *Dendrosoma*.

Blanchard (6) proposes the following classification :—

Class *Sporozoa*.

Order *Sarcosporidæ*.

I. Fam. *Miescheridæ*. Situated in the striated muscles. Enveloping membrane—(*a*) thin and structureless, genus *Miescheria*; (*b*) thick and traversed by fine canaliculi, genus *Sarcocystis*.

II. Fam. *Balbianidæ*. Situated in connective tissue. Enveloping membrane thin and structureless. Genus *Balbiania*.

Blanchard (5) also states that he believes that the *Sarcosporidia* present affinities with the *Coccidia*, especially with the *Polysporea* (*Klossia*).

Bütschli (13) confirms Kleb's discovery [*cf.* Zool. Rec. xxi. *Prot.* p. 5] of a flagellum lying within the equatorial groove and the absence of any cilia. The so-called *Cilioflagellata* are to be regarded as an autonomous group, *Dinoflagellata*, of the *Mastigophora* near the *Flagellata*.

Hæckel (39) gives a sketch of a classification of the *Acanthariæ* (*Radiolaria*).

Grassi (35) places his *Jania annectens*, g. & sp. nn., in the family of the *Lophomonadidæ*, among the *Flagellata*. In the same family he places *Trichonympha agilis*, Leidy, which he renames *Lophomonas trichonympha*. [See also Kent (52).]

Künstler (55) gives a résumé of the structure, physiology, etc., of the *Bacteria*, and compares together such organisms as *Bacillus*, *Spirillum*, *Monas*, *Trypanosoma*, *Protomonas*, *Bacterioïdomonas*, &c. He concludes by saying : "If some of the *Bacteria* should be ranked in the vegetable kingdom from their acquired characters, there are others which should take their place in the animal kingdom; and further, these constitute distinct passage-forms to unequivocal animal groups. It is to the group of Flagellates—more especially the astomatous Flagellates—that these organisms appear to be allied."

Genera and Species.

RHIZOPODA.

Balkwill & Wright (2) describe and figure the following new British *Foraminifera* :—*Ophthalmidium carinatum*, sp. n., p. 326 [*Reophax* sp., p. 328], *Lagena curvilineata*, sp. n., p. 338, *Discorbina tuberculata*, sp. n., p. 350, *Nonionina pauperata*, sp. n., p. 353.

Archerina boltoni, g. & sp. nn., Lankester (58) [see p. 8].

Amœba villosa, *Arcella vulgaris*, *Lieberkuehnia australis*, sp. n., *Echinopyxis australis*, sp. n., *Lecquereusia spiralis*, *Difflugia pyriformis*, all from Australia, von Lendenfeld (61).

Amœba parasitica, sp. n., von Lendenfeld (62).

Arcyothrix balbianii, g. & sp. nn., Hallez (41).

Amphiexis and *Lithozoa*, gg. nn. [no sp. described], Folin (30) [see p. 9].

Collozoum inerme, Müll., *C. fulvum*, sp. n., p. 223, *C. pelagicum*, Häck., *C. hertwigi*, sp. n., p. 228, *Sphærozoum neapolitanum*, Br., *S. acuferum*,

Müll., *S. punctatum*, Müll., *S. häckeli*, sp. n., p. 251, *Myxosphæra*, g. n., p. 254, *M. cærulea*, Häck., *Collosphæra huxleyi*, Müll., *Acrosphæra spinosa*, Häck., *Siphonosphæra tenera*, sp. n., p. 266, Bay of Naples ; Brandt (7A).

Periloculina zitelli, g. & sp. nn., (103) p. 309.

Incertæ Sedis.

Dumontia opheliarum, g. & sp. nn., Künstler (57) [see p. 9].

INFUSORIA.

Flagellata.

Danilewsky (20) gives an account of his researches on *Trypanosoma sanguinis* (*Hæmogregarina*) and other *Hæmocytozoa* from Lizards and Birds.

Fisch (28) describes as new *Chromulina woroniniana*, sp. n., p. 64, *Cyathomonas truncata* (Fres.), p. 74, *Chilomonas paramæcium*, Ehrbg., p. 80, *Codosiga botrytis*, Ehrbg., p. 88, *Peranema trichophorum* (Ehrb.), p. 98, *Bodo jaculans* (Perty), p. 102, *Arhabdomonas vulgaris*, g. & sp. nn., p. 107, *Monas guttula* (Ehrb.), p. 111, *Amœba diffluens* (Müll), p. 115, *Grassia ranarum*, g. & sp. nn., p. 117, *Protochytrium spirogyræ*, Borzi, p. 119 ; most of the above are figured.

Jænia annectens, g. & sp. nn., parasitic in intestine of the Termite *Calotermes flavicollis* ; Grassi (35).

Lophomonas trichonympha, g. & sp. nn., for *Trichonympha agilis*, Leidy ; Grassi (35).

Bacterioidomonas undulans, sp. n., Künstler (54).

Pouchet (75) describes as new :—*Protoperidinium viride*, *Glenodinium obliquum*, *Gymnodinium pulvisculus*, *G. crassum*, *G. teredo*, *G. pseudonoctiluca*, *G. archimedis*.

Heteromita mutabilis, sp. n., p. 438, fig. 16, *Petalomonas carinata*, sp. n., p. 438, fig. 14, *Zygoselmis acus*, sp. n., p. 439, fig. 15, *Anisonema emarginatum*, sp. n., p. 440, fig. 11, *Entosiphon ovatus*, sp. n., p. 440, fig. 12, New Jersey, Stokes (83).

Euglena torta, sp. n., p. 19, *Phacus anacœlus*, sp. n., p. 19, W. New York, Stokes (84).

Physomonas vestita, sp. n., p. 313, *Bicosœca lepteca*, sp. n., p. 314, *B. leptostoma*, sp. n., p. 315, *B. longipes*, sp. n., p. 315, *Stylobryon abbotti*, sp. n., p. 316, *Tillina helia*, sp. n., p. 317, *Derepyxis amphora*, g. & sp. nn., p. 318, *D. ollula*, sp, n., p. 319, *Chilomonas ovata*, sp. n., p. 319, Stokes, (82).

Phacus acuminatus, sp. n., Stokes (84).

Monosiga obovata, sp. n., *Codosiga utriculus*, sp. n., *C. magnifica*, sp. n., *Salpingoeca sphæricola*, sp. n., *S. lagena*, sp. n., Stokes (85).

Ciliata.

Apiosoma piscicola, g. & sp. nn., Blanchard (7). A peritrichous Infusorian, ectoparasitic on carp.

Harpakter socialis, g. & sp. nn., Burch (9).

Entz (22) describes and figures the following :—*Tintinnidium fluviatile*, St., *Codonella lacustris*, sp. n , p. 196, *Tintinnus acuminatus*, C. & L., *T. lusus undæ*, sp. n., p. 202, *T. claparedii*, sp. n., p. 202, *Codonella lagenula*, C. & L., *C. beroïdea*, St., *C. campanula*, Ehr., *Dictyocysta polymorpha*, sp. n., p. 205, *D. millepora*, sp. n., p. 208, *D. templum*, H., *D. mitra*, H., *Cyttarocylis euplectella*, sp. n., p. 212.

Philaster digitiformis, g. & sp. nn., *Nassula brunnea*, sp. n., *Pleuronema marina*, Duj., *Lembus striatus*, sp. n , *Certesia quadrinucleata*, g. & sp. nn., *Aspidisca crenata*, sp. n., *Styloplotes appendiculatus*, Ehr., from Bay of Concarneau ; Fabre-Domergue (26).

Microthorax auricola, sp. n., Fabre-Domergue (27).

Anoplophrya notei, sp. n., parasitic in a Rotifer ; Foulke (32).

Imhof (47) confirms Leidy's suspicion that *Difflugia cratera* is an Infusorian ; in future it must be called *Codonella cratera*. *C. lacustris*, sp. n., Switzerland, is described.

Opercularia constricta, sp. n., Kellicott (50).

Kellicott (51) : *Epistylis cambari*, sp. n., *Vorticella rhabdostyloides*, sp. n., *Gerda sigmoides*, sp. n., *Mesodinium recurvum*, sp. n., *Strombidium oblongum*, sp. n., *Trachelomonas torta*, sp. n., *Diplostyla inhæsa*, g. & sp. nn.

Tillina flavicans, sp. n., p. 441, fig. 8 (*T. inflata*, St., p. 441, fig. 9), *Lacrymaria truncata*, sp. n., p. 442, fig. 10, *Colpidium truncatum*, sp. n., p. 443, fig. 13, *Vorticella octava*, sp. n., p. 443, fig. 17, *Urostyla trichogaster*, sp. n., p. 444, fig. 3, *Opisthotricha emarginata*, sp. n., p. 445, fig. 2, *Stylonychia notophora*, sp. n., p. 446, fig. 1, all from New Jersey ; Stokes (83).

Vorticella smaragdina, sp. n., p. 21, *V. macrocaulis*, sp. n., p. 21, *V. utriculus*, sp. n., p. 23, *V. macrophya*, sp. n., p. 23, *Zoöthamnium adamsi*, sp. n., p. 26, all from Western New York, U.S.A. ; *id.* (84).

Atractonema tortuosa, sp. n., p. 435, *Notosolenus sinuatus*, sp. n., p. 437, *Paramæcium trichium*, sp. n., p. 438, *Cyrtolophosis mucicola*, g. & sp. nn., p. 440, *Euplotes carinata*, sp. n., p. 441, *E. plumipes*, St., p. 442 [new description and fig.] ; *id.* (80).

Loxophyllum flexilis, sp. n., p. 320, *Spirostomum loxodes*, sp. n., p. 321, *Vaginicola leptosoma*, sp. n., p. 322, *Cothurnia annulata*, sp. n., p. 322, *Litonotus vesiculosus*, sp. n., p. 323, *L. carinatus*, sp. n., p. 324, *L. trichocystus*, sp. n., p. 325, *Chilodon fluviatilis*, sp. n., p. 325, *C. caudatus*, sp. n., p. 326, *Dexiotricha plagia*, g. & sp. nn., p. 327 ; *id.* (82).

Leucophrys emarginata, sp. n., *id.* (88).

Stokes (89) describes as new : *Ophryoglena ovata*, sp. n., *Dexiotricha centralis*, sp. n., *Stentor globator*, sp. n., *Strombidinopsis setigera*, sp. n., *Scyphidia constricta*, sp. n., *Uroleptus limnetis*, sp. n., *Stylonychia utrina*, sp. n., *S. vorax*, sp. n.

Vorticella rhabdophora, sp. n., Stokes (94).

Vayssière (91) describes *Scyphidia fischeri*, sp. n., a parasitic Vorticellid on the marine Mollusk *Truncatella*.

Suctoria.

Kellicott (51) : *Acineta cuspidata*, sp. n., *A. flava*, sp. n.

Podophrya brachypoda, sp. n., p. 446, fig. 4, *Solenophrya inclusa*, sp. n., p. 447, fig. 5, *S. pera*, sp. n., p. 448, fig. 6, *Acineta urceolata*, sp. n., p. 448, fig. 7, all from New Jersey ; Stokes (83).

Acineta fluviatilis, sp. n., *A. lappacea*, sp. n., *A. alata*, sp. n. ; *id.* (84).

SPOROZOA.

Blanchard (5) does not name the new Sarcosporidian he finds in the connective-tissue layer of the large intestine of *Petrogale penicillatus*.

Hæmogregarina (*Cistudinis*) *stepanowi*, g. & sp. nn., p. 597, an intracellular parasite in the red-blood corpuscles of *Emys lutaria* belonging to the *Cytozoa* ; Danilewsky (19).

(*Monocystidæ*) *Callyntrochlamys*, g. n., p. 546, *C. phronimæ*, sp. n , p. 547, *Gregarina portuni*, sp. n., p. 556, *G. cionæ*, sp. n., p. 557, *G. bonelliæ*, sp. n., p. 559, (*Polycystidea*) *Aggregata*, g. n., p. 560, *A. portunidarum*, sp. n., p. 560, *Gregarina salpæ*, sp. n., p. 565, *G. dromiæ*, sp. n., p. 572, *G. clausii*, sp. n. [intestine of *Phronima*], p. 575, *G. nicææ*, sp. n., p. 578, *G. caprellæ*, sp. n., p. 578, *G. conformis*, Dies. [in *Cancer*, etc.], p. 579 ; all the above are from the Gulf of Naples and are figured : Frenzel (34).

Ruschhaupt (76) redescribes the following Gregarines found in the testis of an Earthworm : *Zycocystis cometa*, *Monocystis magna*, *M. cristata*, *M. porrecta*, *M. cuneiformis*, sp. n., p. 721, *M. agilis*, *M. minuta*, sp. n., p. 722 ; and describes the history of several of them.

Neozygites aphidis, g. & sp. nn., Witlaczil (97).

Alcon,
Alethaxi...
Aleuropteryx,
Allmaniella,
Allœoscelis, *I*

* This list, i
1066 names ; thi

INDEX TO

GENERA AND SUBGENERA RECORDED AS NEW IN THIS VOLUME,

INCLUDING NEW NAMES FOR GENERA ALREADY CHARACTERIZED.*

[The symbol ‖ indicates that the name to which it is affixed has been used before in Zoology.]

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* This list, in which the Arachnid genera of 1883 and 1884 are repeated, contains 1066 names; this is about the average.

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