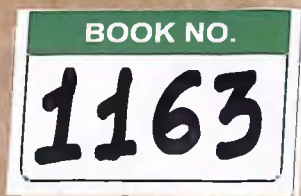




THE
RECORD
OF
ZOOLOGICAL LITERATURE.

1864.

VOLUME FIRST.



EDITED BY
ALBERT C. L. G. GÜNTHER,
M.A., M.D., PH.D., F.Z.S., ETC. ETC.



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These reports will be given in the second volume (1865).

P R E F A C E.

THE object of the 'Record' is to give, in an annual volume, reports on, abstracts of, and an index to, the various zoological publications which have appeared in the preceding year; to acquaint zoologists with the progress of every branch of their science in all parts of the globe; and to form a repertory which will retain its value for the student of future years.

Unity of plan has been aimed at throughout the volume; but the several Records must necessarily vary in some measure, not only according to the individuality of the Recorders, but also in consequence of the different degrees of development of the various branches of Zoology. Whilst our knowledge of Mammals has been so far advanced that investigators direct their attention chiefly to a more perfect understanding of the internal characters, and to the further development of the natural system, other classes offer a greater temptation in the great number of still unknown generic and specific forms which require description. In the lower animals, researches into internal structure and history of development must constitute the principal portion of the literature. However, to secure a near approach to uniformity in the Records, the following rules were recommended to the contributors:—

1. To commence each Record with *a list of the various publications*, arranged chronologically, systematically, or alphabetically, with such remarks on their object, extent, and nature as cannot well be embodied in the special part of the Record. The student should be fully informed what he may expect to find in

the work or memoir, and the Recorder may add any critical remarks which he thinks necessary for the object in view.

2. To arrange the contents of all the publications *systematically* in the second, *special part* of the Record. This part will contain almost all the abstracts of memoirs and papers, new systematic arrangements, and discoveries. Papers difficult of access to the generality of zoologists to be given more in detail than others.

3. Of new genera short diagnoses are to be given, if, in the opinion of the Recorder, such genera are likely to take a place in the system, whilst the names only of subgeneric divisions are mentioned. All species described as new, with their habitats, and emended descriptions of known ones, are to be enumerated, with exact references to the several works and mention of accompanying illustrations. Diagnoses of new species to be given only when they are described in a journal or work difficult of access.

4. The titles of anatomical papers to be given; but only those to be more specially treated which have a direct bearing on the classification, specific definition, or the life-history of an animal.

5. The boundary-line between popular and scientific literature, having become of late rather indefinite, such popular publications to be mentioned as deserve attention by their tendency to promote scientific knowledge, directly or indirectly.

Since the publication of the 'Record' has been announced, the undertaking has met with a most favourable reception—its usefulness and necessity being acknowledged by all. The scientific part of the zoological literature of 1864, to which this volume forms a guide, amounts to more than 25,000 pages, which exceeds the original estimate derived from similar reports of former years, and must account for the excess of the number of pages of this volume beyond that given in the prospectus issued by the Publisher.

The Editor and Contributors trust that they have been fairly successful in their endeavours to render the Records complete. The difficulties in this respect were not small, arising chiefly

from the circumstance that a great part of the journals of the various learned societies are published long after the dates given on their title-pages; and several have not appeared even at the time of the issue of this volume, yet they will bear the date 1864! Arrangements have been made to obtain such late publications as soon as possible after their issue; but as it is of great importance that the annual volume of the 'Record' should never be delayed far beyond the middle of each year, it is thought advisable that such loiterers should be carried over to the report of the year following.

The Contributors have great pleasure in acknowledging the opportunities which have been liberally afforded them of consulting numerous works in the libraries of the Zoological, Entomological, Linnean, and Royal Societies, in that of the Royal College of Surgeons, and in the Royal Library at Berlin.

The Editor regrets very much being obliged to defer the Records on *Cœlenterata* and *Protozoa* to the second volume, the gentleman to whom this portion was entrusted having failed to keep his engagement; and as this did not become apparent until after two months' waiting, it was then too late to find a substitute.

Finally, the Editor would crave indulgence for imperfections of this volume, in consideration of the difficulties which must necessarily attend the commencement of such an undertaking; and he would request all interested in our science to favour him with suggestions which may tend to the improvement and perfection of the 'RECORD.'

ALBERT GÜNTHER.

London, August, 1865.

[Communications, papers, and memoirs intended for this work should be addressed *solely* to "The Editor of the Zoological Record, care of Mr. Van Voorst, 1, Paternoster Row, London." All publications sent will be distributed among the several Recorders.]

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RECORD

OF

ZOOLOGICAL LITERATURE.

MAMMALIA

BY

ALBERT GÜNTHER, M.A., M.D., PH.D.

A. Separate Publications.

Monograph of the Bats of North America. By H. ALLEN.
Washington: Smithsonian Institution, 1864, June. 8vo.
pp. 85, with numerous woodcuts.

The author describes in this valuable memoir twenty species contained in the collections of the Smithsonian Institution, of the Philadelphia Academy of Natural Sciences, and of the Museum of Comparative Zoology at Cambridge (Mass.). Three are new. The synonymy is carefully compiled; and in order to enable the student to decide for himself with regard to forty-one of the names, considered by Mr. Allen as synonyms, but made use of by various authors to denominate as many species, the original descriptions are reproduced in an appendix. Every genus and species is illustrated by woodcuts representing the head, ear, skull, or interfemoral membrane.

Catalogue of Mammalia in the Collection of the Australian Museum. By GERARD KREFFT. Sydney, 1864. 16mo.
pp. 134.

The Australian Museum of Sydney is evidently rapidly increasing in extent and importance under the care of its energetic Curator. The publication of a catalogue of the contents of a collection is always a proof of its healthy state, and, as we have ample evidence to show, the surest road to further development.

1864. [VOL. I.]

B

We can only congratulate Mr. Krefft for having chosen Dr. Gray's Catalogue of Mammalia as his guide, and for not having burdened this commencement of zoological literature in Australia with the useless repetition of descriptions of animals perfectly well known. It would appear that the total number of species in the Sydney Museum is 283. Most of the Australian species are accompanied with notes on their habits or geographical distribution. The Catalogue does not contain species which have not been described elsewhere.

J. VAN DER HOEVEN. *Philosophia Zoologica*. Lugd. Batav., 1864. 8vo.

This work treats of the nature of animals generally, giving an outline of the histology, physiology, anatomy and embryology of the different classes. The third book is devoted to the method of systematic and descriptive zoology, and the last to the geographical distribution of animals. In the course of the Records, we shall now and then have occasion to refer to this work.

Die Structur der Retina. Dargestellt nach Untersuchungen über das Walfisch-Auge. Von C. RITTER. Leipzig, 1864. 8vo (with two plates).

[The Structure of the Retina, from Researches on the Eye of the Whale.]

B. Papers published in Journals.

WYMAN, J. Description of a "White Fish," or "White Whale" (*Beluga borealis*, Less.). Boston Journ. Nat. Hist. vii. * pp. 603-612, with a plate.

CRISP, E. On some parts of the Anatomy of the Porpoise. Proc. Zool. Soc. 1864, January 12 (p. 17).

ESCHRICHT, D. F. Recherches sur la distribution des Cétacés dans les mers boréales. Ann. Sc. Nat. 1864, I. April (pp. 201-224).

We are informed by the editor of the 'Annales des Sciences Naturelles,' that Eschricht at the time of his death was engaged in the publication of another work on Cetaceans, and that the present memoir is merely a fragment of it, taken from the first proof sheets. The author had such an extensive knowledge of Cetaceans, and even in this fragment so completely exhausts his subject, that we are very glad to hear that the fears expressed by M. Milne-Edwards of this work being lost to science will not be realized, and that the publication of the manuscript,

* We must remark that, although the fourth part of this volume bears 1863 as date of publication on the titlepage, it was not received in this country before February 1865.

or of such parts of it as are advanced enough, will be continued.

The fragment contains general introductory remarks on the geographical distribution of Cetaceans, then treats more especially of those observed on the western coast of Greenland; a most detailed account of the migration of *Balena mysticetus* is added.

GRAY, J. E. Note on the Bonnet of the Right Whale. Proc. Zool. Soc. 1864, April 26 (pp. 170-171, with a woodcut).

FLOWER, W. H. On a Lesser Fin-Whale (*Balenoptera rostrata*, Fabr.) recently stranded on the Norfolk Coast. Proc. Zool. Soc. 1864, May 24 (pp. 252-258).

GRAY, J. E. On the Cetacea which have been observed in the Seas surrounding the British Islands. Proc. Zool. Soc. 1864, May 24 (pp. 195-248, with many woodcuts).

BAER, E. VON. Noch ein Wort über das Blasen der Cetaceen, mit bildlichen Darstellungen. Bull. Acad. Sc. St. Pétersb. 1864, vii. April 1 (pp. 333-341).

DUGUID, A. R. Description of a species of Dolphin (*Lagenorhynchus leucopleurus*) found in the Orkney Islands. Ann. and Mag. Nat. Hist. 1864, xiv. August (pp. 133-136, with a plate).

GRAY, J. E. Notes on the Whalebone-Whales, with a Synopsis of the species. Ann. and Mag. Nat. Hist. 1864, xiv. November (pp. 345-353).

FLOWER, W. H. Notes on the Skeletons of Whales in the principal Museums of Holland and Belgium, with descriptions of two species apparently new to science. Proc. Zool. Soc. 1864, November 8 (pp. 384-420, with woodcuts).

FLOWER, W. H. On a new species of Grampus (*Orca meridionalis*) from Tasmania. Proc. Zool. Soc. 1864, November 8 (pp. 420-426, with two woodcuts).

GRAY, J. E. Notice of the Atlas and other cervical vertebrae of a Right Whale in the Museum of Sydney, New South Wales. Proc. Zool. Soc. 1864, November 22 (pp. 587-594, with woodcuts).

GERVAIS, P. Cétacés des côtes françaises de la Méditerranée. Compt. rend. Acad. Sc. Paris, 1864, ii. November 28 (pp. 876-881).

This paper does not contain descriptions of the species observed, but is rather an enumeration of the occurrences of eight species distinguished by the author; an abstract of it will be given below.

VAN BENEDEN, P. J. Mémoire sur une nouvelle espèce de

- Ziphius* de la mer des Indes. Mém. Couronnés Acad. Sc., Lett. et Beaux-Arts Belg. 1864, xvi. (pp. 23, with a plate).
- VAN BENEDEN, P. J. Sur un Dauphin nouveau (*Delphinus guianensis*) et un Ziphioïde rare (*Mesoplodon sowerbiensis*) Ibid. (pp. 21, with two plates and woodcuts).
- VAN BENEDEN, P. J. Sur un Cétacé (*Globiocephalus*) échoué devant la ville d'Anvers le 27 avril 1864. Bull. Acad. des Sc., des Lettres et des Beaux-Arts de Belgique, 1864, xvii. pp. 439-443.
- POELMAN —. Sur un *Delphinus eschrichtii*, échoué à Flessingue. Bull. Acad. Sc., Lett. et Beaux-Arts Belg. 1864, xvii. pp. 604-608, with a plate.
- FLOWER, W. H. Note on the number of the cervical vertebrae in the Sirenia. Nat. Hist. Rev. 1864, pp. 259-264.
- MALMGREN, A. J. Beobachtungen und Anzeichnungen über die Säugethier-Fauna Finnmarkens und Spitzbergens. Wiegmann. Arch. Naturgesch. 1864, pp. 63-97.—This paper was first published in Overs. Kong. Svenska Vetensk. Akad. Förhandl. 1864, ii. pp. 127-155.
- NEWTON, A. Notes on the Zoology of Spitsbergen. Proc. Zool. Soc. 1864, November 8 (pp. 494-502).
- MALMGREN, A. J. Om tandbyggnaden hos Hvalrossen (*Odobenus rosmarus*, L.) och tandombytet hos hans ofödda unge. Öfvers. Svensk. Vetensk.-Akad. Förhandl. 1864 (read October 14, 1863), pp. 505-522, with a plate.
- PETERS, W. Ueber das Milchgebiss des Walrosses. Monatsber. Acad. Wiss. Berl. 1864, December 12 (pp. 685-687, with a plate).
- NORDMANN, A. v. Beobachtungen über einen lebenden *Herpestes mungo* (Desm.). Bull. Soc. Nat. Mosc. 1863, pp. 476-481.
- PETERS, W. Ueber die Säugethier-Gattung *Solenodon*. Abhandl. Acad. Wiss. Berl. (1863) 1864 (pp. 22, with three plates).
- FLOWER, W. H. On the brain of the Javan Loris (*Stenops javanicus*, Illig.). Trans. Zool. Soc. vol. v. 1864 (pp. 103-111, with a plate).
- FLOWER, W. H. On the brain of the Red Howling Monkey (*Myceles seniculus*). Proc. Zool. Soc. 1864, June 28 (pp. 335-338, with a plate).
- FLOWER, W. H. On the optic lobes of the brain of *Echidna*. Proc. Zool. Soc. 1864, January 26 (pp. 18-20, with two woodcuts).
- BARNSTON, G. Remarks on the genus *Lutra* and on the species

- inhabiting North America. *Canad. Natur.* 1863, June (pp. 13, with woodcuts).
- GRAY, J. E. Description of a new *Mustela* from Quito. *Proc. Zool. Soc.* 1864, February 9 (p. 55, with a plate).
- GRAY, J. E. Notes on some Mammalia, with the description of a new *Golunda*, from Western Africa. *Ibid.* (pp. 55-58).
- CRISP, E. Contributions to the anatomy of the Giraffe, with an account of the length of the alimentary canal of many of the Ruminants, as measured by the author. *Proc. Zool. Soc.* 1864, February 9 (pp. 63-68).
- CRISP, E. Further contributions to the anatomy of the Giraffe and the Nylghau. *Proc. Zool. Soc.* 1864, June 14 (pp. 269-271).
- GRAY, J. E. Notes on the species of Sand-Moles (*Georychus*). *Proc. Zool. Soc.* 1864, March 8 (pp. 123-125, with woodcuts).
- HEUGLIN, TH. v. Beiträge zur Zoologie Central-Africa's. *Nov. Act. Acad. Leop. Carol. Nat. Cur.* xxiii. (xxxi.)* 1864 (pp. 15, with a plate).
- SCLATER, P. L. On the Mammals collected and observed by Capt. J. H. Speke during the East-African Expedition. *Proc. Zool. Soc.* 1864, March 8 (pp. 98-106, with woodcuts and one plate).

The list consists of thirty-nine species, sixteen of them being Antelopes, one half of which are identical with Mozambique species. Two are described as new, and will be mentioned below.

- KIRK, J. List of Mammalia met with in Zambesia, East Tropical Africa. *Proc. Zool. Soc.* 1864, December 13 (pp. 648-660).

This list comprises sixty-seven well-determined species, two of which are new and will be mentioned below, besides a few domestic animals. The author has added, to many, notes on their geographical distribution and habits.

- PETERS, W. Ueber neue Arten der Säugethier-Gattungen *Geomys*, *Haplodon* und *Dasypus*. *Monatsber. Acad. Wiss. Berl.* 1864, March 17 (pp. 177-180).
- PETERS, W. Ueber einige neue Säugethiere. *Monatsber. Acad. Wiss. Berl.* 1864, June 20 (pp. 381-384).

* The Editors of these Transactions have adopted the disadvantageous plan of having two different title-pages for each volume; thus, the present volume is described as vol. xxxi. *Decad. quart. Tom. ii.* on one title-page, and as vol. xxiii. *Decad. tert. Tom. iv.* on the other. The consequence is that one and the same paper is constantly quoted in two different ways, and that reference to the papers is rendered very difficult.

- DANA, J. D. The classification of animals based on the principle of Cephalization. No. III. Classification of Herbivores. Amer. Journ. of Sc. and Arts, 1864, March (pp. 157-183).
- LORD, J. K. Notes on the *Urotrichus*. Proc. Zool. Soc. 1864, April 12 (pp. 161-163).
- SWINHOE, R. On a new Rat from Formosa. Proc. Zool. Soc. 1864, May 10 (pp. 185-187).
- SWINHOE, R. Letters on Mammals of the Island of Formosa. Proc. Zool. Soc. 1864, November 8 (pp. 378-383).
- PETERS, W. Ueber das Milchgebiss von *Chiromys madagascariensis*. Monatsber. Acad. Wiss. Berl. 1864, April 14 (pp. 243-245).
- HUXLEY, T. H. On the Angwántibo (*Arctocebus calabariensis*, Gray) of Old Calabar. Proc. Zool. Soc. 1864, June 28 (pp. 314-335, with many woodcuts).
- MIVART, ST. G. Notes on the crania and dentition of the *Lemuridae*. Proc. Zool. Soc. 1864, November 22 (pp. 611-648, with woodcuts).
- MILNE-EDWARDS, A. Recherches anatomiques, zoologiques et paléontologiques sur la famille des Chevrotains. Ann. Sc. Nat. 1864, ii. July to September (pp. 49-167, with 11 plates). Abstract in Compt. rend. Acad. Sc. Paris, 1864, lix. August 8 (pp. 287-290).
- BLYTH, E. Notes on sundry Mammalia. Proc. Zool. Soc. 1864, November 8 (pp. 482-486).
- GRAY, J. E. A revision of the genera and species of Viverrine animals, founded on the collection in the British Museum. Proc. Zool. Soc. 1864, November 8 (pp. 502-579, with woodcuts).
- GRAY, J. E. A Revision of the genera and species of Ursine animals (*Ursidae*), founded on the collection in the British Museum. Proc. Zool. Soc. 1864, December 13 (pp. 677-709, with woodcuts).
- FITZINGER, L. J. Revision der bis jezt bekannt gewordenen Arten der Familie der Borstenthierc oder Schweine (*Setigera*). Sitzgsber. Akad. Wiss. Wien, vol. 50, 1864, November 10. (Separate copy, pp. 52.)
- PETERS, W. Ueber das normale Vorkommen von nur sechs Halswirbeln bei *Cholæpus hoffmanni* (Ptrs). Monatsber. Acad. Wiss. Berl. 1864, December 8 (pp. 678-680).
- SCLATER, P. L. Note on the *Quadruman* living in the Society's Menagerie. Proc. Zool. Soc. 1864, December 13 (pp. 709-712, with two plates).

- MARTENS, E. VON. Bemerkungen über Panther-Arten. Zoolog. Garten, 1864 (pp. 279-283).
- TICKELL, S. R. Note on the Gibbon of Tenasserim, *Hylobates lar*. Journ. As. Soc. Beng. 1864 (pp. 196-199, with a figure).
- EMBLETON, D. Notes on certain parts of the Anatomy of a young Chimpanzee. Nat. Hist. Rev. 1864 (pp. 250-258).
- BÖCKING, A. Ueber *Hydrochærus capybara*. Wieg. Arch. Ntrgesch. 1864 (pp. 32-40).
- JOUAN, CH. Additions à la faune de la Nouvelle Calédonie. Mém. Soc. Sc. Nat. Cherbourg, 1864, pp. 301-311.
- The author states that the mammals of New Caledonia are small and few in number, and that their affinity is more with those of Oceania than of Australia.
- MULDER, C. Over het buitengewoon Uitgroeijen van de Snijtanden bij verschillende Knaagdieren. Versl. en Mededeel. Akad. Wet. Amsterd. 1864, xvi. (pp. 206-225, with two plates).
- The author enumerates and describes a number of cases of abnormal growth of the incisors in various species of *Rosores*. The paper is illustrated by two plates of figures.
- MACDONALD, W. On the Vertebroid Homologies of the Cranium in *Vertebrata* or *Osteozoa*, and the analogous Homologies of the *Annulozoa* or *Articulata*. Proc. Phys. Soc. Edinb. iii. 1864 (pp. 15).
- GRUBER, W. Sur le *Sinus communis* et les *Valvula venæ cardiacæ*, et sur la duplicité de la *vena cava superior* chez l'homme et les mammifères. Bull. Acad. Sc. St. Pétersb. vii. 1864 (pp. 10-18, abstract).
- HYRTL, J. Neue Wundernetze und Geflechte bei Vögeln und Säugethieren. Denkschr. Akad. Wiss. 1864, xxii. pp. 113-152, with nine plates.
- MENNELL, H. T., and PERKINS, V. R. A Catalogue of the Mammalia of Northumberland and Durham. Trans. of the Tyneside Natur. Field Club, vi. 1864, pp. 111-177, with woodcuts.

This is not a mere list of names, each species being accompanied by notes of chiefly local interest. The authors have evidently taken great care to render their list as complete as possible, and their determination of species accurate. In this they appear to have been very successful, except in the case of the Marten, where they very confound *Mustela martes* and *Mustela foina* under the common name of *Martes abietinum*. The Catalogue contains 59 species, 50 of which are wild; consequently

the fauna of these northern counties is rich and has been well worked out; it is, however, "impoverished in Bats," by reason of the higher northern latitude. The following figures show the proportion of this fauna to that of other counties:

	Wild Species.	Total Species.
British Fauna	67	75
Shropshire	26	35
Staffordshire	29	37
North Kent	30	39
Cornwall	39	48
Northumberland and Durham	50	59

Three species have become extinct, viz., *Canis lupus* since the middle of the sixteenth century, *Sus scrofa fera* even before that time, and *Castor fiber* since the time of Henry I. The *Wild Cat*, *Cervus elaphus*, and *C. capreolus* have disappeared only within the most recent times. *Lepus variabilis* is doubtful as an inhabitant of these counties. The presence of the Bull in a wild state, and of some rare Cetaceans gives particular interest to this fauna.

C. Publications of a Popular Character.

Der Zoologische Garten. Herausgegeben von Prof. Dr. C. BRUCH.
Vol. v. Frankfurt a. M., 1864. 8vo.

This Journal, edited for the Zoological Society of Frankfort, first by Dr. D. Weinland, and now by Prof. C. Bruch, has entered the fifth year of its existence. Its object is not only to publish periodical reports and accounts of the animals kept in the menagerie of that Society, and in the other numerous zoological gardens established all over Germany after the successful attempt in Frankfort, but also to give articles of more general interest and of direct scientific value. Thus, although this Journal is chiefly of a popular character, we shall frequently have occasion to refer to it.

Illustriertes Thierleben. Eine allgemeine Thierkunde des Thierreichs. Von Dr. A. E. BREHM. Säugethiere, vols. 2. Hildburghausen, 1863-65. With many woodcuts.

Die Thiere des Waldes. Von A. E. BREHM und E. A. ROSS-MÄSSLER. Leipzig and Heidelberg, 1864. 8vo.

An entertaining and, for the general public, very instructive volume of 658 pages; it includes all the vertebrate animals of the forests of Germany. The sketches of the characters and habits of the different animals are well drawn, as, indeed, was to be expected from two men who have devoted the greater part of their lives to the study of natural history. The book is illustrated by a number of engravings and woodcuts.

THE number of known species of Mammals is, according to Van der Hoeven (Philos. Zool. p. 330), 1800; but this computation was made in accordance with the state of the knowledge on the subject in the year 1855, without reference to the discoveries made since the publication of 'Wagner's Säugethiere.'

PROF. J. D. DANA has commenced to publish a series of papers, in which he exhibits his ideas of a natural system of the animal kingdom. The paper on the Classification of Herbivores falls within the limits of this Record; but, in order that the position of this subdivision in the class of Mammals, and the principle of classification generally employed may be understood, we must refer to a preceding paper, "On the higher subdivisions in the Classification of Mammals," in Amer. Journ. 1863, p. 65.

The principle of classification used by the author is the "*cephalization of the body*"—that is, the subordination of its members and structure to head-uses. This principle and all its applications rest on the following facts:

1. An animal is embodied or concentrated force, which force manifests polarity in the results of its action in development—that is, in the oppositeness of the anterior and posterior extremities of the structures evolved, and also in the dorso-ventral relations of these structures.

2. The primary potential centre is in the head, or, more precisely, in the cephalic nervous mass—an animal being fundamentally a cephalized organism. But, besides this, there may be one or more secondary centres.

3. Species differ (*a*) in the amount of force concentrated; (*b*) in the degree of control of the systemic force over vegetative growth and development; (*c*) in the distribution of the force along the principal (or fore and aft) axis—that is, in its being concentrated mainly anteriorly, or diffused, to a greater or less degree, from the cephalic extremity posteriorly toward the caudal extremity or pole.

4. The differences just mentioned are expressed in the structure of the organism; and all such expressions are necessarily expressions of grade.

5. Each of these kinds of differences must have expression, or be apparent, (*a*) through the various circumstances attending development or growth, and (*b*) through all the steps in the progress of growth, as well (*c*) in the resulting structures.

Although the characteristics afforded by the principle of cephalization, like all others appealed to in classification, cannot overrule affinities based on obvious resemblances in type of structure, yet this subject throws new light on the limits and gradal distinctions of groups. The concentration of the anterior

extremity of the body and abbreviation of its posterior portion is a mark of elevation ; the transfer of the anterior members of the thorax to the cephalic series is the foundation of rank among the orders of Crustaceans. In the Mammals *two* is the prevailing number of pairs of locomotive organs ; and when there is a transfer of the anterior of these two from the locomotive to the cephalic series, there is evidence of a distinction of the very highest significance, of an extreme cephalization of the system, which places *Man* apart from the whole series of Mammals.—The other Mammals are either true *viviparous* species, or *semi-oviparous* (Marsupials and Monotremes), the latter being related to oviparous Vertebrates.

The viviparous Mammals (exclusive of Man) may be divided according to the same principle as Crustaceans, viz., according to "the magnitude of the life-system." In one group, the *Megasthenes*, the life-system is so much more powerfully and bulkily developed than in the other, the *Microsthenes*, that the lineal ratio between the life-systems of both groups is not far from 4 : 1, as between the Decapodes and Tetradeapodes. Some species of the second division are of great bulk, as for instance the ancient Sloths ; but this is an example of vegetative overgrowth ; for the bodies of the Sloths, great and small, are, in fact, too bulky to be wielded well by the small life-system within. The classification indicated is, then, as follows :

I. ARCHONTIA (vel DIPODA)—MAN (alone).

II. MEGASTHENA.

III. MICROSTHENA.

1. *Quadrumana*.

1. *Chiroptera*.

2. *Carnivora*.

2. *Insectivora*.

3. *Herbivora*.

3. *Rodentia*.

4. *Mutilata* (Cetaceans proper).

4. *Bruta* (Edentata).

IV. OOTOCOIDEA.

1. *Marsupialia*.

2. *Monotremata*.

It is evident that the author has intended to exhibit a parallelism between the tribes of the second and third subdivisions, the tribes of both series rising in grade from the fourth to the first on the principles of cephalization. The first is properly *hypertypic*, the second *superior typical*, the third *inferior typical*, and the fourth *hypotypic*.

As regards the *Herbivores*, they show their inferiority to the *Carnivores* in the following ways:—1. In the fore limbs being defunctionated of the power of prehension, and reduced to simple locomotive organs. 2. In the fore limbs being not so much superior to the hind limbs in strength as in the *Carnivores*, and even inferior to the hind limbs in some species,—*Herbivores*

being less strongly "*prosthénic*" than Carnivores, and the species of the larger and most characteristic group being "*metasthénic*." 3. In the structure (skeleton and fleshy covering) being strongly "*amplificate*," the herbivorous species having either the structure enlarged beyond the type-size for the amount of systemic force (gross amplification), or exhibiting an increased proportional length of the body and its members (long amplification). 4. In the head being prolonged or amplified. 5. In the extremely wide variations as to size and shape under the type, and the occurrence of bizarre features. 6. In the forehead, in very many species, being perverted to serve for defence or attack, &c. 7. In the typical species being "elliptic" (deficient through abnormal weakness) as regards one or more of the four types of teeth. 8. In being prematurative in development, the young animals having the power of sight and locomotion almost as soon as born. On the whole, the vegetative force in Herbivores is far less under systemic control than in Carnivores. The Carnivores may be styled a *tight* type, the Herbivores remarkably a *loose* one.

Prof. Dana regards the Herbivorous Cetaceans as a "Urosthénic aquatic" division of the Herbivora; their superiority to the Cetaceans proper (*Mutilata*) is exhibited in their having the nostrils never defunctionated to blowholes, in never being multiply as to the number of bones of the extremities and of teeth, in never being so elementalized as to the teeth that the distinction into the different types (molars, &c.) is lost, and, finally, in having the "*primary* potential centre" (brain) never abnormally remote from the anterior extremity.

The classification itself of the Herbivores, gained by the further application of the principle of cephalization, is expressed in the following synopsis:

I. *STHENORHINES*. Prosthenic. Snout serving as a power-organ, usually elongated. Gross-amplificate, rarely long-amplificate in extinct species. Horns, when any, proceeding from the exoskeleton alone, nasal.

A. *Proboscideans*. Snout an organ of digital as well as brachial prehension. Imparidigitate.

1. Elephantids.
2. Dinotherids (?).

B. *Tapirideans*. Snout imperfectly, or not at all, prehensile. Imparidigitate.

1. Rhinocerotids—having a nasal horn.

2. Tapiroids—without a nasal horn. Snout elongate, often imperfectly prehensile.

- a. Tapirids. b. Palæotherids.

3. Hyracids—without a nasal horn. Snout not elongate.

C. *Suideans*. Snout elongate, but not at all prehensile. Paridigitate.

1. Suids.
2. Hippopotamids.

II. STHENOMERES. Metasthenic. Long-amplificate, even when gross-amplificate. Snout not a power-organ. Horns, when any, proceeding from the endoskeleton, frontal.

A. *Solipedes*. Without horns. Imparidigitate.

1. Equids.

2. Macrauchenids (?).

B. *Ruminants*. Having horns in the typical group, except often in females. Paridigitate.

1. Cornigers—having horns; frontiferient.

a. Cervids. b. Antilopids. c. Camelopardalids.

2. Nudifronts—without horns; not frontiferient, feeble in self-defence.

a. Camelids. b. Moschids. c. Anoplotherids.

C. ————?

III. SIRENIANS. Urosthentic, natatorial. Having a large caudal fin for swimming. Posterior limbs wanting.

Manatus, *Halicore*, *Rhytina*, &c.

In the preceding abstract we have given the principal results of that part of Prof. Dana's researches into a natural system of classification which refers to the Mammals; but no abstract could do justice to his ingenious treatment of the subject, and his philosophical interpretation of the several characters in accordance with a principle first defined by himself. Indeed, if the principle of cephalization be right and fundamental (as Professor Dana believes), its discovery would be a great step towards securing unity of system, at a period when zoologists devote themselves more and more to the study of special branches, and adopt the most various methods of classification. Yet this tendency in zoology, to enter into the details of structure and affinity of specific forms, is a sign of a healthy development of our science. Facts must be thoroughly investigated and accumulated before any application of a principle like that of cephalization can be possible beyond the higher divisions of the animal kingdom. Therefore we do not think that, at present at least, it will be of much practical use; but whether it be followed up or not, no one can read Professor Dana's memoirs without being struck by the very many new lights in which the relations of the different groups appear, and without feeling a desire to test the truth of the principle by its application to the branch which forms one's own special study.

QUADRUMANA.

Dr. Sclater has given a list of the different species living in the menagerie of the Zoological Society of London, *Proc. Zool. Soc.* 1864, p. 709. It comprises 21 *Simiidae*, 10 *Cebidae*, 10 *Lemuridae*, and the Aye-Aye. We mention the Chimpanzee, the Orang, *Macacus speciosus* and *M. cyclopes*, seven true *Lemur*, and *Nycticebus tardigradus*.

SIMIIDÆ.

Troglodytes niger. Dr. D. Embleton has dissected a young Chimpanzee, and arrived at the same conclusions as others, viz. that it is not, properly speaking, quadrumanous, but that it possesses four prehensile extremities, two hands and two feet, and that its brain differs from that of man only in size and weight. Prof. Wyman's paper in Proc. Bost. Soc. v. p. 274 is not referred to. Nat. Hist. Review, 1864, p. 250.

Hylobates lar. Colonel Tickell makes interesting observations on the habits of the Gibbon in a free state and in captivity. It is found in great abundance in all the forests skirting the hills which run from north to south through the province of Tenasserim. They ascend the hills themselves up to an elevation of 3000 to 3500 feet, and are usually met with in parties of from eight to twenty individuals. This species extends southward to the Straits, and northward to the northerly confines of Pegu. To the west of the spur dividing British Burma from Arakan, and throughout the latter province into the mountains east of Chittagong, is found only *Hylobates hoolock*. Journ. As. Soc. Beng. 1864, p. 196.

Macacus cyclopis. Dr. Sclater mentions and figures the most extraordinary development of the cutaneous parts round the vulva, extending over a great part of the lower base of the tail. Proc. Zool. Soc. 1864, p. 710.

CEBIDÆ.

Mycetes seniculus. Mr. Flower has described and figured the brain of this species, which was unknown before, and exhibits some remarkable features. It is only $\frac{1}{2}$ of the weight of the entire animal; the sulci are distinct and deep, but tolerably symmetrical, not numerous or complex, and with very few secondary grooves. It is distinguished by an excessive prolongation of the Sylvian fissure, the absence of the angular sulcus and of any well-marked external and internal perpendicular fissures, and the simplicity of the calcarine fissure. It is one of the lowest forms of brain among the New World Apes, which show a great diversity in this respect. Taking *Cebus* as the form in which the type of brain of the Old World Apes is precisely repeated, we find in *Ateles* a modification in the ascending direction, whilst *Pithecia*, *Callithrix*, *Nyctipithecus*, and more especially *Mycetes* most remarkably depart from the ordinary type seen in the order. It is worthy of remark that the mental characteristics of the Howlers are in accordance with the structural peculiarities of their brain; they are surly and untameable, and their intelligence is far inferior to that of *Ateles*. Proc. Zool. Soc. 1864, p. 335, pl. 29.

Ateles beelzebuth. Hyrtl describes the retia mirabilia in the extremities. Denkschr. Acad. Wiss. Wien, 1864, xxii. p. 122.

Pithecia satanas. Dr. Sclater has figured a young example of this species in Proc. Zool. Soc. 1864, p. 712, pl. 41.

LEMURIDÆ.

Mr. Mivart has examined the skulls of numerous species of this family with the intention of finding characters by which the smaller forms can be more clearly defined and arranged. Proc. Zool. Soc. 1864, p. 611. He gives detailed descriptions of the

cranial and dental characters of various genera, and after having expressed his conviction that the Primates are composed of two very natural suborders—viz. *Anthropoidea*, including Man and all the Apes, Monkeys, and Baboons, as well as the Marmosets; and *Lemuroidea*, containing the Lemurs, Lemurines, and the Aye-Aye,—he arranges the latter suborder into the following families, subfamilies, and genera; the subfamilies and genera are characterized, and the synonymy of the genera is completely worked out:

Family 1. LEMURIDÆ.

Subfamily 1. *Indrisinæ*, with three genera, viz. *Indris* (Geoffr. St. Hil.), *Propithecus* (Benn.), *Microrhynchus* (Jourd.).

Subfamily 2. *Lemurinae*, with five genera:

a. *Lemur* (Geoffr. St. Hil.).

b. *Haplemur* (I. Geoffr. St. Hil.). The skull of this Lemur (*H. griseus*) is described, and the mandible and dentition are figured, p. 613.

c. *Microcebus* (Geoffr. St. Hil.). Mr. Mivart enumerates six species, of which the synonymy is given, viz. *M. myoxinus* (Peters); *Galago minor* (Gray) = *Lepilemur murinus* (Gray), the skull and dentition described and figured on p. 615; *Cheirogaleus smithii* (Gray); *Lemur pusillus* (Geoffr. St. Hil.) = *Galago madagascariensis* (Geoffr.); *Cheirogaleus typicus* (Smith); *Lemur fuscifer* (Blainv.), with figures of the dentition, p. 621.

d. *Cheirogaleus* (Geoffr. St. Hil.): *Ch. milii*.

e. *Lepilemur* (I. Geoffr. St. Hil.).

Subfamily 3. *Nycticebinæ*, with four genera, viz. *Nycticebus* (Geoffr. St. Hil.), *Loris* (Geoffr. St. Hil.), *Perodicticus* (Benn.), *Arctocebus* (Gray).

Subfamily 4. *Galagininae*, with the genus *Galago*, in which four subgenera are admitted, viz. *Otolemur* (Coquerel), *Otogale* (Gray), *Otolinus* (Ill.), and *Hemigalago* (Dahlb.).

Family 2. TARSIDÆ.

Family 3. CHEIROMYIDÆ.

Arctocebus calabarensis. Prof. Huxley gives a most exhaustive account of the zoological characters of this species, of its dentition compared with that of other Lemurine Apes, and of its visceral anatomy, Proc. Zool. Soc. 1864, p. 314. The paper is illustrated by numerous woodcuts.

As regards the zoological characters, the specimen examined by Prof. Huxley agreed with that described by Dr. J. Alexander Smith, whose account, read before the Royal Physical Society of Edinburgh, is quoted at full length, and the author had to add only a more detailed description of the ear, hand, and foot, which are figured; but he found an unexplained discrepancy between his specimen and that of Dr. Smith: the latter had described the inner upper incisors as smaller than the outer ones, whilst all are equal in size in the specimen under description. In the course of the paper, the dentition of *Arctocebus* is compared with that of the other *Lemuridæ*, and the author directs particular attention to the gradual transitions of form from premolar to molar, in the upper and lower jaws, the antero-internal cusp of the molar being connected with the postero-external by an oblique

ridge which is not developed in the premolar. By its appearance, the molars of *Arctocebus* acquire the pattern so obvious in Anthropoid Apes and in Man, but which is absent in all the Old World Apes and in most of those of the New World.

The author then describes the abdominal viscera; he found the Stensonian ducts; uvula and vermiform appendix of cæcum are absent; liver broken up into numerous lobules; kidney with but a single papilla; os penis well developed. The author leaves it undecided whether a pair of large sacs situated above the prostata and behind the neck of the bladder, and not communicating directly with the vasa deferentia, ought to be regarded as vesiculæ seminales, or as a large uterus masculinus.

A *rete mirabile* is present in the brachial as well as in the femoral artery; although the author has omitted to look for another in the caudal artery, we may presume that it is absent, the tail being very short. These vascular plexus do not appear to differ essentially from the *rete mirabile* of *Stenops tardigradus* as described by Rapp; and the statement of the author, that only a part of the ramuscles were injected, indicates that the *rete mirabile* of *Arctocebus* includes a venous system, as in *Stenops*.

Finally, Prof. Huxley agrees with Dr. Gray that *Arctocebus* is generically distinct from *Perodicticus* (Benn.), but he distinguishes it by additional characters, viz.: Tail rudimentary. Pinna of the ear with two projecting shelf-like lamellæ above the auditory meatus. The index finger rudimentary and nailless. Dental formula: i. $\frac{2-2}{2-2}$. c. $\frac{1-1}{1-1}$; premol. $\frac{3-3}{3-3}$; mol. $\frac{3-3}{3-3}$. The anterior upper molars have oblique ridges and are quadricuspid; the last is tricuspid; the last lower molar quinquecuspid.

Lemur rufus. Prof. Hyrtl describes the *retia mirabilia*, in Denkschr. Acad. Wiss. Wien 1864, xxii. p. 124.

Stenops javanicus. Mr. Flower gives a very detailed description of the brain of this species, taken from a fresh example, and compares it, at the end of the memoir, with that of the higher Quadrumana and of some Carnivores of a similar size. It departs considerably from the former by the shortness of the posterior lobes of the cerebrum, which do not completely cover the cerebellum, and by the large size of the olfactory lobes; yet it retains the most distinctive characteristics of the Monkey-brain, viz. a complete Sylvian fissure, and a well-developed calcarine sulcus. On the other hand, a comparison of this brain with that of a Cat or of a *Cercopithecus* shows that it belongs to an entirely different type; so that even the nomenclature of the superficial parts of the hemisphere of the one utterly fails us when we attempt to apply it to the other. Trans. Zool. Soc. v. 1864, p. 103; several views of the brain are given on pl. 27.

Otolicnus senegalensis. Prof. Hyrtl describes the arteries of the forearm, in Denkschr. Acad. Wiss. Wien, 1864, xxii. p. 130.

Otolicnus crassicaudatus. Dr. Gray describes a variety (*kirkii*) collected by Kirk at Quillimane; Dr. Kirk adds some notes on its habits. Proc. Zool. Soc. 1864, p. 456. On the same animal, see Kirk, *ibid.* p. 650. Dr. Sclater is inclined to consider *Galago monteiri* (Bartlett) as a pale variety of this species. Proc. Zool. Soc. 1864, p. 711.

Galago garnettii. Dr. Sclater has figured this species from a living example. Proc. Zool. Soc. 1864, p. 711, pl. 40.

Chiromys madagascariensis. Prof. Peters has examined a young example with milk-teeth; he found a small deciduous incisor behind and at some distance from the large one. Then follow the maxillary teeth, viz. a canine tooth and two molars, the anterior of which is small and deciduous; also the second is not permanent, in size and form similar to the false molar of the adult animal. There was no tooth in the lower jaw which would correspond to the deciduous incisor and canine tooth of the upper jaw; there were two molars on the left-hand side, but one only on the right. The fundus of the gall-bladder is directed forwards, and not backwards as in *Lemur* and *Microcebus*. The author is inclined to consider the Aye-Aye as an aberrant form of the *Lemuridae*. Monatsber. Acad. Wiss. Berl. 1864, p. 243.

FERÆ.

CHIROPTERA.

Prof. Hyrtl describes parts of the arterial system of several species of this family. Denkschr. Akad. Wiss. Wien, 1864, xxii. p. 132.

Vespertilio bechsteini. The occurrence of this species in Sweden is recorded by Wahlgren, in Öfvers. Vetensk. Akad. Förhandl. 1864, xxi. p. 77.

Mr. Allen, Bats of North America, describes the following new species:—*Vespertilio evotis*, p. 48, from Western North America; *V. affinis*, p. 53, from Arkansas; and *V. yumanensis*, p. 58, from California.

Prof. Peters has identified *Lobostoma cinnamomeum* (Gundlach, in Wiegman. Arch. 1840) with *Mormops blainvillii* (Leach), whilst *Mormops blainvillii* of Peters (Abhandl. Acad. Wiss. Berl. 1856, p. 287) proves to be a distinct species, for which he proposes the name of *Mormops megalophylla*. The former is from the West Indies, the latter from the continent of tropical America, especially from Mexico. Monatsber. Acad. Wiss. Berl. 1864, p. 381.

Macrotus minor (Gundlach), sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 382, from Cuba.

Vesperus segethi, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 383, from Chile.

Dysopes (Molossus) gigas, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 383, from Cuba.

Dysopes hepaticus, sp. n., Heuglin, Nov. Act. Acad. Carol. Leop. Nat. Cur. xxiii. 1864, p. 14, from Central Africa.

Nycticejus nidicola, sp. n., Kirk Proc. Zool. Soc. 1864, p. 651, from Shupanga, near the Zambesi.

Epomophorus whitii (Benn.). Dr. Gray makes a few notes on this species, Proc. Zool. Soc. 1864, p. 56.

Epomophorus anurus, sp. n., Heuglin, Nov. Act. Acad. Carol. Leop. Nat. Cur. xxiii. 1864, p. 12, from Central Africa.

Hypsignathus monstrosus (Allen) = *Sphyrocephalus labrosus* (Murray). Dr. Gray describes and figures the head of a young specimen of this species Proc. Zool. Soc. 1864, p. 55.

INSECTIVORA.

Prof. Peters proposes, in his memoir on *Solenodon* (Abhandl. Akad. Wiss. Berl. 1864), the following arrangement of this family:—

- A. Intestinal tract with a large cæcum.
 - a. Bones of lower leg separate; zygomatic arch complete.
 - α. Ulna imperfect.
- I. GALEOPITHECI (*Galeopithecus*).
 - β. Ulna perfect.
- II. TUPAYÆ (*Cladobates*, *Philocercus*, *Hylogale*).
 - b. Bones of lower leg coalesced; zygomatic arch complete.
- III. MACROSCÉLIDES (*Rhynchocyon*, *Macroscelis*).
 - B. Intestinal tract simple, without cæcum.
 - a. Bones of lower leg separate; no zygomatic arch; bullæ osseæ none, os tympanicum ring-shaped.
- IV. CENTETINA (*Solenodon*, *Centetes*, ?*Ericulus*, ?*Echinogale*).
 - b. Bones of lower leg coalesced; zygomatic arch complete; bullæ osseæ more or less developed; cranium completely ossified.
 - α. Ears well developed.
- V. ERINACEI (*Erinaceus*, *Gymnura*).
 - β. Ears rudimentary or absent.
- VI. TALPINA (*Myogale*, *Urotrichus*, *Condylura*, *Scalops*, *Talpa*, *Chrysochloris*).
 - c. Bones of lower leg coalesced; no zygomatic arch; parts of the base of the skull membranaceous; os tympanicum ring-shaped.
- VII. SORICES (*Sorex*).

Solenodon. Prof. Peters has received a specimen of this very rare mammal through Prof. Poey, who discovered it in Cuba; it proved to be a species distinct from the *Solenodon* of San Domingo; the diagnoses of the two species are—

1. *S. paradoxus*. *S.* supra fuscus vel nigro-fuscus, lateribus, gastræo pedibusque ochraceis; pilis incumbentibus.—From S. Domingo.

2. *S. cubanus*. *S.* capite, collo, pectore, gastræi lateribus fulvis vel dilute ochraceis; corpore reliquo, stria longitudinali nuchæ abdominisque fuscis vel nigro-fuscis; pilis longissimis villosis.—From the mountains of Bayamo and Trinidad (western and southern parts of Cuba).

The two species differ also in the form of different parts of the skull and of the dentition, although the formula of teeth is the same for both, at least in the adult state: $\frac{3.4}{3.4} \frac{1}{1}; \frac{1-2-1}{4}; \frac{1}{1}, \frac{4.3}{3.4} = 40$. Prof. Peters gives a minute description of the external characters, of the teeth, and of the anatomy, comparing them in this and in allied genera; he is inclined to group it with Madagascar genera like *Centetes*. This memoir is illustrated by three plates. Abhandl. Akad. Wiss. Berl. (1863) 1864.

Urotrichus. Mr. Lord describes the habits of this singular animal, which he found on the western slope of the Cascade Mountains in North-west America. The specimens collected by him would belong to *Urotrichus gibbsii* (Baird), but he could not find the slightest difference between this species and the Japanese *U. talpoides*. Proc. Zool. Soc. 1864, p. 161.

Sorex vulgaris continues to be common in, and without, the houses on Renö (Finmarken), 70° lat. N. Malmgren, Wiegman. Arch. 1864, p. 64. (Oefvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 127.)

Rhinomys (Murray). Dr. Gray has examined the typical specimen on which Mr. Murray had founded this genus (Proc. Roy. Phys. Soc. Edinb. 1860, p. 159), and considers it not distinct from *Sorex*, and the species—*Rhinomys soricoides*—probably identical with *Sorex myosurus*. Proc. Zool. Soc. 1864, p. 57.

FELIDÆ.

Felis tigris. On the ravages committed by tigers at Singapore, see Martens in Zool. Garten, 1864, p. 382. The same traveller narrates the fight of a tiger with a buffalo, *ibid.* p. 418.

Felis onca. Dr. Crisp has discovered a large patch of agminated crypts in the cæcum of the Jaguar. Proc. Zool. Soc. 1864, p. 271.

Felis variegata (Wagn.) and *Felis pardus* (Wagn.). Dr. von Martens is inclined to regard the Javan race as distinct from the African, because it has the tail longer and the legs shorter. He also proves that the ancients, although using two names (which are forms of the same root), *πάρδαλις* and *πάνθηρ*, did it indiscriminately, without intending to fix these two names to two distinct animals. Zool. Garten, 1864, p. 231.

Felis poliopardus (Fitz.). Dr. v. Martens reminds us of an observation made by his father, that an animal belonging to this form, born in a menagerie, was a hybrid between the Jaguar and the so-called *F. melas*. He also mentions the different dark-coloured varieties of some of the large species of this genus; they are generally found in the mountainous parts of a country: as regards *F. melas*, it is a fact well known in Java, that black and yellow panthers are found in the same litter. Zool. Garten, 1864, p. 280.

Leopardus brachyurus. Mr. Swinhoe makes some further remarks on specimens of this species, Proc. Zool. Soc. 1864, p. 380.

Felis uncia. Dr. R. Meyer received from an importer of furs two skins which had been bought of a Russo-Northamerican Company. He describes and figures both, after having determined one as *Felis irbis* (Müll.) and the other as *Felis variegata* (Wagn.). Zool. Garten, 1864, pp. 40-46, with two plates. Dr. Fitzinger (*ibid.* p. 200) agrees with Dr. Meyer as regards the determination of *F. irbis*, but considers the second individual to be a mere variety (perhaps of age) of the other. However, Dr. Meyer, in a reply (p. 231), does not adopt this opinion, but is still inclined to consider them as distinct species, whatever the proper name of his *F. variegata* should be.—The Recorder has compared the figures with Himalayan specimens in the British Museum (*F. uncia*): although there are slight differences in the markings, they agree in other respects with the species of Dr. Meyer; but their tail is comparatively shorter.

Felis (Leopardus) jacobita, sp. n., Cornalia, Rendicont. Istit. Lombard. di Sc. e Lett. 1864, i. p. 241. *Felis villosa*, cinerea, subtus et intus albida; maculis brunneis pallidis plenius rotundatis aut ovato-elongatis, seriatim dispositis, per latera corporis descendentibus, maculis ventralibus rubiginosis aut læte fulvis, artubus externe nigro fasciatis, interne parce nigro maculatis. Cauda elongata, occiput attingente, annulis latis, perfectis, 9 brunneis.—Hab. in Bolivia circa Potosi et Humahuaca.—Total length 0m 60; length of tail

0^m.45; height in the scapular region 0^m.35. Obtained at an altitude of 1500 metres.

VIVERRIDÆ.

Dr. J. E. Gray has given a complete revision of the genera and species of this group, in Proc. Zool. Soc. 1864; in the division of the species into genera, and also in the distinction of the species, he has been essentially assisted by the examination of the skulls which have been collected by him in the course of the last thirty years. However, he has found at the same time that the skull and the teeth are quite as liable to vary in form in each species (within certain limits, these limits being different in the various species) as any other part of the animal. He has recognized the form and mobility of the toes as an important character, which is used to divide the whole group into two sections. All the genera and most of the species are characterized by a diagnosis; and many have descriptions and figures of the skulls added. The number of species distinguished is 111; they are referred to 36 genera and 12 groups. The arrangement is the following:—

I. CAT-FOOTED VIVERRINES. ÆLUROPODA.

Toes curved, arched, hairy, webbed; claws sharp, retractile.

A. *Typical. Digitigrade.* The underside of the feet hairy, except the pads, metatarsus, and sometimes a small part of the tarsus. Upper flesh-tooth elongate; upper tubercular grinder small, transverse. Nose short; underside flat, with a central groove. *Viverracea.*

1. Body robust; tubercular grinders $\frac{2}{1}$, $\frac{2}{1}$; back of tarsus hairy. *Viverrina.*

Proteles (Geoffr.), *Viverra* (L.), *Bassaris* (Licht.), *Viverricula* (Hodgs.)

2. Body robust; tubercular grinders $\frac{2}{1}$, $\frac{2}{1}$; underside of the tarsus with a narrow naked streak. *Genettina.*

Genetta (Cuv.), *Fossa*, g. n., p. 518, typical species *Viverra fossa* (Schreb.) = *Fossa daubentonii* (Gray).

3. Body slender, elongate; tubercular grinders $\frac{1}{1}$. *Prionodontina.*

Prionodon (Horsf.); *Poiana*, g. n., p. 520, typical species *Genetta richardsonii* (Thomps.), which is the adult animal of *Genetta poënsis* (Waterh.): this genus is distinguished from *Prionodon* in having a narrow naked streak on the back of the tarsus.

B. *Aberrant. Subplantigrade.* The underside of the toes and more or less of the back of the tarsus naked, callous. Flesh-tooth strong, upper tubercular grinders large, broad.

1. Nose produced; underside convex, hairy, without any central longitudinal groove; hinder part of the tarsus bald, callous. Face produced. *Cynogalina.*

Cynogale (Gray).

2. Nose short, underside flat, with a central groove; the hinder part of the tarsus hairy to the palm; the tail bushy. *Galidiina.*

Galidia (Geoffr.).

3. Nose short, underside flat, with a central groove; the upper part of the hinder part of the tarsus hairy; tail ringed. *Hemigalina*.

Hemigalea (Jourd.).

4. Nose short, underside flat, with a central groove; the hinder part of the tarsus bald, callous; tail thick, strong, prehensile. *Arctictidina*.

Arctictis (Temm.).

5. Nose short, underside flat, with a central groove; the hinder part of the tarsus bald, callous; tail very long, subconvolute; frenum naked, granular; head elongate. *Paradozura*.

a. *Paradozurus* (F. Cuv.). Flesh-tooth elongate, triangular; tubercular teeth oblong. Orbit very incomplete.—The characters of the species of this and the allied genera have been more especially examined; the following appear to be of importance, and ought to be particularly attended to in descriptions:—the development of the osseous bulla of the ear, the width and position of the choanæ, the form and size of the flesh-tooth, the form of the brain-case, and spots under the eye and on the cheek. The species of this genus are subdivided into subgenera: *Bondar*, with the type *P. bondar*; *Platyschista*, with the type *P. zeylanicus*; *Macrodon*, with the type *P. fasciatus* and with a new species, *P. macrodon* (p. 538), known from the skull only; habitat unknown.

b. *Nandinia* (Gray). Flesh-tooth elongate, triangular; tubercular teeth triangular, transverse. Orbit rather incomplete. Palate narrow, short. Typical species: *N. binotata* (Reinw.), p. 530.

c. *Paguma* (Gray). Flesh-tooth short, triangular, large; orbit very imperfect.—The species are divided into two subgenera: *Paguma*, with the type *P. larvata*; *Amblyodon*, with the type *P. grayi*.

d. *Arctogale* (g. n., Peters). Flesh-tooth triangular, small. Orbit nearly complete; palate very narrow, elongate. Typ. species: *Viverra trivirgata* (Reinw.).

6. Nose short, underside flat, with a central groove; the hinder part of the tarsus bald, callous; tail long, bushy; head short, broad; frenum hairy (?). *Cryptoproctina*. *Cryptoprocta* (Temm.).

II. DOG-FOOTED VIVERRINES. CYNOPODA.

Toes elongate, separate, more or less hairy; claws exerted, blunt; feet narrow, underside bald or only covered with short hairs. Orbit of skull complete, or nearly complete, behind.

A. Nose short, its underside flat, with a central groove. *Herpestacea*.

1. Head elongate, conical; tail conical or cylindrical. *Herpestina*.—Several of the genera referred to this tribe being proposed for the first time, we give the principal characters of all.

* Front claws elongate, compressed; back streaked. *Galidictis* (L. Geoffr.).

** Front claws short, compressed; back grizzled; flesh-tooth long, narrow.

a. Toes 5-5. Tail conical, with long hair; teeth moderate. *Herpestes* (Ill.), with 22 species, three of which are new, viz. *H. dorsalis* (p. 549) from South Africa, *H. jerdonii* (p. 550) from Madras, and *H. persicus* (p. 554) from Persia.

b. Toes 5-5. Tail conical, with long hair. Teeth very large: *Athyia* (F. Cuv.) with a new species, *A. robustus* (p. 558), from the White Nile; skull figured.

c. Toes 5-5. Tail cylindrical, elongate, covered with shortish hairs; tip pencilled: *Calogale* (g. n., p. 560). This genus has been formed for fourteen species, formerly referred by authors to *Herpestes*, as for instance *H. nyula* (Hodgs.), *H. sanguineus* (Rüpp.); two, formerly determined as *H. badius* (Smith), are considered to be distinct from this species, viz. *Calogale grantii* (p. 561), and *Calogale venatica* (p. 563), from East Africa.

d. Toes 5-4. Tail cylindrical, elongate, covered with short hair: *Galerella* (g. n., p. 564), with the type *Herpestes ochraceus* (Gray).

*** Front claws short, compressed; flesh-tooth broad, triangular.

a. Toes 5-5; tail conical, with long hairs. Back grizzled. Pupil oblong, transverse: *Calictis* (g. n., p. 564), with the type *Herpestes smithii* (Gray).

b. Toes 5-5; tail elongate, subcylindrical. Back cross-banded: *Ariela* (g. n., p. 565), with the type *Herpestes tennionotus* (Smith).

c. Toes 5-5; legs rather high, tail conical, bushy. Back grizzled: *Ichneumia* (I. Geoffr.).

d. Toes 4-4: *Bdeogale* (Peters).

**** Front claws elongate, produced; tail conical, with long hair. Back grizzled. Toes 5-5.

a. Head elongate. Soles of hind feet hairy. False grinders $\frac{3}{4}$: *Urva* (Gray).

b. Head elongate. Soles of hind feet bald. False grinders $\frac{3}{4}$: *Taeniogale* (g. n., p. 569), with the type *Herpestes vitticollis* (Benn.).

c. Head elongate. Soles of hind feet hairy; front claws very long. False grinders $\frac{4}{3}$: *Onychogale* (g. n., p. 570) with the type *Herpestes macarthiae* (Gray).

d. Nose short. False grinders $\frac{2}{3}$. Soles bald: *Helogale* (Gray).

2. Head short, ventricose; tail bushy, expanded laterally; claws elongate. *Cynictidina*.

Cynictis (Ogilby).

B. Nose produced; its underside convex, hairy, without any bald central groove. *Rhinogaleacea*.

1. Head elongate, nose short; teeth 40, false grinders $\frac{3}{4}$. *Mungosina*.

a. Tail conical. Toes 5-5; front claws short: *Rhinogale melleri* (g. n. & sp., p. 573) from Eastern Africa; skull figured.

b. Tail conical. Toes 5-5; front claws elongate: *Mungos* (Gray).

2. Head ventricose, nose elongate; teeth 36; false grinders $\frac{3-3}{3-3}$. *Crossarchina*.

Crossarchus (F. Cuv.), *Eupleres* (Doyère), *Suricata* (Desm.).

Viverra. Dr. Blyth makes some remarks on the geographical distribution and variations of the Asiatic species. Proc. Zool. Soc. 1864, p. 484.

Viverra ashtoni, sp. n., Swinhoe, Proc. Zool. Soc. 1864, p. 379, with a woodcut, from Formosa.

Herpestes mungo. M. A. von Nordmann gives an interesting account of the habits of a specimen kept in captivity. Bull. Soc. Nat. Mosc. 1863, p. 476.

Viverra zibethica. Prof. Hyrtl describes the arteries of this species, in Denkschr. Acad. Wiss. Wien, 1864, xxii. p. 131.

Paradoxurus tytleri, sp. n., Tytler, Journ. As. Soc. Beng. 1864, p. 188, from Viper Island (Andaman Islands).

CANIDÆ.

Canis lagopus. Mr. A. Newton found the Arctic Fox pretty numerous in Spitzbergen. Nearly all the Icelandic examples are "Blue" Foxes; that is to say, this species does not change its colour in Iceland, which fact must be taken in connexion with the comparatively mild winter of this island, and is analogous to the circumstance of the Alpine Hare (*Lepus timidus*, Linn., non auct.) always becoming white in winter in Scandinavia, generally so in Scotland, and but seldom in Ireland. The common Squirrel is another case in point; and all three may be considered illustrative of the vexed questions of the specific distinctions between the Great Northern Falcons and of the specific identity of *Lagopus scoticus* and *L. albus*. It is difficult to answer the question how the Spitzbergen Foxes obtain food in winter. Perhaps they lay up a stock of provisions; the author found a considerable collection of shells of *Mya truncata* on a moraine, which may possibly have been due to this cause. Proc. Zool. Soc. 1864, p. 496.—Hr. Malmgren (Wiegmann Arch. 1864, p. 66) says that in winter they feed on Ptarmigan and on the remains of the prey left by the Polar bears. But these sources could supply only a small proportion of the food required by so great a number of animals.

MUSTELIDÆ.

Mustela aureoventris, sp. n., Gray, Proc. Zool. Soc. 1864, p. 55, pl. 8, from Quito.

Martes flavigula. Dr. Blyth makes some remarks on the different races of this species, Proc. Zool. Soc. 1864, p. 485.

Zorilla albinucha, sp. n., Gray, Proc. Zool. Soc. 1864, p. 69, pl. 10; hab.—?

Lutra destructor is described as a new species from Canada by Mr. Barnston in Canad. Natur. for June 1863; its skull and that of *L. canadensis*, for comparison, are figured.

Anahyster (Murray). Dr. Gray has examined the skull of the typical specimen on which Mr. Murray had founded this genus (Proc. Roy. Phys. Soc. Edinb. 1860, p. 157), and considers it to be identical with *Aonyx* (Less.); Proc. Zool. Soc. 1864, p. 56.

URSIDÆ.

Dr. Gray has reexamined the specimens of Bears in the collection of the British Museum, paying particular attention to the form of the skull and to the dentition, which appear to be liable to a considerable amount of variation in specimens from the same locality and with the same habits. The genera and species are characterized, and their synonymy is worked out; many skulls are described and the principal measurements given. The systematic arrangement has been modified as follows (Proc. Zool. Soc. 1864, p. 677):—

Section I. BRACHYPODA. The Broad-footed Bears. Toes straight; claws exerted.

Tribe 1. *Ursina*, with the following genera:—

a. *Thalassarcos* (Gray); type *U. maritimus*.

b. *Ursus*. Carrion-Bear. Dr. Gray admits nine species; the European *Ursus arctos* extends to the northern island of Japan, and varies exceedingly in the form of the skull, particularly in its front part, and in the more or less developed curvature of the lower edge of the mandible, and in the coloration. Dr. Gray distinguishes four varieties and eight subvarieties. The gigantic specimen from Northern Europe, which lived in the Zoological Gardens in the Regent's Park for many years and was seen by the greater part of zoologists, is, for the present, considered by him as a variety (var. 2. *grandis*); but on examination of further specimens it may prove to be a good species. The "Barren-ground Bear" of Richardson and *U. horribilis* var. *horriaceus* of Baird, from New Mexico, are considered to be one species, distinct from the common Grizzly Bear (*U. cinereus* or *ferox*), both forming a subgenus, *Danis*. Finally, *U. americanus* and *U. cinnamomeus* are referred to another sub-genus, *Euarctos*.

c. *Myrmarcos* is a new genus with these characters:—Nose of the skull produced, much longer than broad, flat above. Nose, forehead, and front of crown all on one line. False grinders far apart, small. Palate concave. Brain-case compressed. Lower jaw large, elongate. It is established for the Bears which have been distinguished by Worm, Pallas, and Eversmann as *Ant-Bears*. These Bears appear to extend from Norway to Siberia; the species in the British Museum, *Myrmarcos eversmanni*, sp. n., from Norway is nearly allied to *Ursus formicarius* (Eversm.) from Eastern Siberia. The skull is figured on p. 696.

d. *Helarctos* (Horsf.). It would appear from Dr. Gray's researches that this genus is represented by a species in Australasia (*H. malayanus*), by another in Africa (*Helarctos*? *crowtheri*, Schinz), by a third in America (*H. ornatus*), and by a fourth in Europe; the last is Nilsson's *Ursus euryrhinus*, which rests on a specimen in the Lund Museum, said to have come from Hungary.

e. *Melursus* (Meyer); type *Ursus labiatus*.

Tribe 2. *Nasuina*, with the genus *Nasua*. The distinction of the species of this genus has always been a puzzle to zoologists. Dr. Gray says that he has examined with care a series of skulls which are said to have belonged to *N. rufa* and *N. narica*, but that he has been unable to discover any characters by which the skulls belonging to one species can be distinguished from those belonging to the other: the skulls vary considerably in different points; but when a series of some twenty or more are examined, it is impossible to define any distinction. He was unable to recognize *N. solitaria* (Neuwied), which is, perhaps, a variety of *N. narica*, *N. nocturna* (Neuwied), and *N. monticola* (Tschudi). He distinguishes the following three species:—

a. *N. rufa* (Desm.). Fur fulvous; back darker; sides of nose and head ashy; tail fulvous and black-ringed.

b. *N. narica* (L.). Fur blackish brown, beneath yellowish; head ashy; tail black and yellow, obscurely ringed. The sides of the nose are sometimes marked with a black and white streak.—Surinam.

c. *N. olivacea* (Gray). Olive-brown, grizzled; hairs black-brown, with a yellowish subterminal ring; under-fur black; face pale; orbits, legs, and feet

blackish brown; chest yellowish grey; tail short, with black rings and a black tip.—Santa Fé de Bogota.

Tribe 3. *Procyonina*, with the genus *Procyon*,—*P. cancrivora* being the type of a subgenus, *Euprocyon*.

Section II. DENDROPODA. The Cat-footed Bears. Toes short, arched; claws retractile.

Tribe 4. *Cercoleptina* (*Cercoleptes*).

Tribe 5. *Ailurina* (*Ailurus*).

Ursus. Dr. Sclater reports on the different Japanese Bears living in the Zoological Gardens in the Regent's Park. One is probably *U. arctos*, var. *beringensis* (Middend.), the other *U. japonicus* (Schleg.), Proc. Zool. Soc. 1864, p. 374.

Mr. Swinhoe regards the Bear of the Island of Formosa as an undescribed animal, for which he proposes the name of *U. formosanus*, Proc. Zool. Soc. 1864, p. 380.

Ursus maritimus. Hr. Malmgren makes some remarks on its habits, Wieg. Arch. 1864, p. 64. (Oefvers. Svensk. Vetensk.-Akad. Förhandl. 1864, p. 128.)

Ursus arctos is rare in Finmark, according to Hr. Malmgren, Wieg. Arch. 1864, p. 66.

Meles taxus. An instance of a female Badger producing young after being fifteen months (!) in solitary confinement is recorded in the 'Zoologist,' 1864, p. 9277.

PHOCIDÆ.

Dr. Gray (Proc. Zool. Soc. 1864, p. 27) has received a Seal from the west coast of North America which proves to be undescribed, and the type of a distinct genus; he names it *Halicyon richardii*. On this occasion the author has re-examined the skulls of the species of his second subfamily of *Phocidæ*—*Phocina*, and has found that the form of the lower jaw affords a very good character for the distinction and subdivision of the species. He modifies the arrangement proposed in his "Catal. Seals," p. 20, thus:—

1. Branches of lower jaw diverging; the lower edge of the lower jaw rounded, simple; palate angularly arched behind; angle of lower jaw blunt, sloping behind. *Callocephalus*, type *C. vitulinus*.

2. Branches of lower jaw diverging; lower edge of lower jaw dilated on the inner side.

* Palate angularly notched behind; angle of lower jaw blunt, sloping behind. *Pagomys*, type *P. fœtidus*; *P. nummularis* belongs, perhaps, to this group.

** Palate truncated behind; angle of lower jaw acute, erect behind, with a notch above the basal tubercle. *Pagophilus*, type *P. grœnlandicus*.

3. Branches of lower jaw arched on the side and wide apart; lower edge produced on the inner side behind the symphysis; palate arched.

* Tubercle on inner edge of front part of lower jaw elongate, sharp-edged; teeth moderate; angle of lower jaw simple, with a distinct notch above it. *Halicyon*, type *H. richardii*, sp. n.

** Tubercle on inner edge of front part of lower jaw blunt, rugulose; teeth small; angle of lower jaw with a rounded lobe on inner side above the basal tubercle. *Phoca*, type *Ph. barbata*.

In the course of this paper Dr. Gray makes several other observations:—

1. Each species of Seal appears to have a very well defined and very limited geographical distribution (p. 30).

2. Though the species are very difficult to distinguish by their external characters, yet the skeleton, and especially the skull, affords well-marked and very definite characters (p. 30).

3. The number of species in the British Museum collection is now twenty-four (p. 33).

4. The species figured by Gaimard, Voy. Isl. et Groën. pl. 11, with the name of *Phoca hispida*, is *Ph. annellata*, whilst his *Ph. annellata* is *Ph. grönlandica* (p. 31).

5. Of the skull of *Phoca nummularis* (Temm.) fragments only are known; so that its position in the system is not quite certain. The measurements of different parts of the skull are given in comparison with those of *Phoca fœtida* (p. 31).

6. *Heliophoca atlantica* (Gray) proves to be identical with *Monachus albi-venter*, Bodd. (p. 33).

Phoca barbata. Hr. Malmgren makes some interesting remarks on this species; it is very numerous in Spitzbergen (and very probably the *Phoca grönlandica* of Ross in Parry's "Narrative of an attempt to reach the North Pole"), but rare on the Finmark coast; it is always found single, near to the coast, and feeds chiefly on mollusca and crustacea. Having found a temperature of 30° R. in the abdomen of an individual about forty minutes after it had been killed, the author thinks this a sufficient proof that the blood of the Seals has a higher temperature than that of Land-Mammalia. Wiegman. Arch. 1864, p. 74.

Phoca grönlandica. On the habits of this species see Malmgren, Wiegman. Arch. 1864, p. 78. (Öfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 139.)

Phoca hispida. On its habits see Malmgren, Wiegman. Arch. 1864, p. 82. (Öfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 142.)

Halichærus grypus is rare in Finmark, and not found in Spitzbergen. Malmgren, Wiegman. Arch. 1864, p. 74. (Öfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 135.)

Cystophora borealis. The Hooded Seal is becoming much scarcer in Spitzbergen and Finmark than it formerly was. It is a truly pelagic species. Malmgren, Wiegman. Arch. 1864, p. 72. (Öfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 134.)

Trichechus rosmarus. Hr. A. J. Malmgren has made the following observations which deserve particular attention:—

The tusks of these animals do not serve as organs of locomotion, but have a more important function, viz. that of obtaining food. The Walrus lives exclusively on two kinds of Mollusca, *Mya truncata* and *Saxicava rugosa*, which, at a depth of from 10 to 50 fathoms, are imbedded in holes in the mud, from 5 to 7 inches deep. With the aid of its tusks the Walrus digs them up; and after having extracted the animals from the shells with its molar teeth and tongue, it swallows them entire without masticating them.

Only once another animal was found in the stomach, viz. a gigantic *Priapulus caudatus*. Young Walruses, more than a year old, with tusks from $\frac{1}{4}$ to 1 inch long, are unable to obtain the same kind of food, but continue to suck the old females, whose udders are full of milk. The time of copulation occurs in the end of May or in June; the female is with young for nearly a year; it suckles it for nearly two years—that is, until the tusks of the young have grown to the length of 3 or 4 inches, when it can obtain its food, independently of the mother. As long as the young is very tender, the mother lives isolated from the rest; but afterwards the mothers congregate in herds. No copulation takes place during the two years of lactation; therefore it is evident that the Walrus propagates its species only every fourth year. The sexes form separate herds, the females, with their offspring, living closer to the shore than the males. The Walrus has no intestinal worms. (Æfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 130.)

The same author has examined the milk-teeth of the Walrus (Æfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 505), and figured the dentition of an embryo (on pl. 7). He thinks that the skull examined by Wiegmann showing five molar teeth in the upper jaw must have been abnormal, and that Wiegmann had come to erroneous conclusions. In the embryo observed by Hr. Malmgren, the formula of teeth would be $\frac{4}{4}$, $\frac{1}{2}$; $\frac{6}{6}$; $\frac{1}{1}$, $\frac{4}{4}$. The following of these teeth disappear first, and already before birth, either all, or at least for the greater part:—the inner pair of incisors of both jaws, the first pair of molars of the upper, the second of the lower jaw, and the third pair of molars of both jaws. A short time after birth, or at the commencement of the period of lactation, the following are lost:—the middle lower incisors, the upper and lower canines, the first pair of lower molars, and subsequently the second pair of upper molars, and the outer incisors of both jaws. The middle incisors of the upper jaw and the fourth pair of molars of both jaws are the teeth which remain longest, but these also are usually lost before the animal commences to be independent of the mother—that is, two years after birth. One or the other pair of the teeth mentioned last may remain to the third or fourth year; but this is the exception, and they are never found in old and full-grown individuals.

The permanent teeth are already developed in the fœtus, $\frac{3}{3}$, $\frac{1}{1}$; $\frac{2}{6}$; $\frac{1}{1}$, $\frac{3}{3}$.

In consequence of this paper, Prof. Peters was induced to examine the skull of a specimen with milk-teeth from Labrador, about eighteen months old (Monatsber. Acad. Wiss. Berl. 1864, p. 685). He figures the jaws, and shows that Hr. Malmgren was rather too hasty in declaring erroneous the formula for the milk-teeth which had been generally adopted since it had been given by Wiegmann, viz. $\frac{5}{4}$, $\frac{1}{1}$; $\frac{6}{6}$; $\frac{1}{1}$, $\frac{5}{4}$. The Labrador skull has the five upper molars most distinct, and so regularly placed that none of them can be considered abnormal.

Prof. Peters says that the knowledge of the number of milk-teeth is important in this genus, because only thus the presence of those supernumerary teeth can be explained which are found in adult animals, and which are nothing else but milk-teeth abnormally developed at a later period of the growth of the animal. He observes that Fremery had already observed the presence of five molars, founding a second species chiefly on this character.

Mr. A. Newton strongly urges to renew the experiment of obtaining young

living examples of the Walrus. They have several times been brought to Europe; one was exhibited in England as far back as 1608. Proc. Zool. Soc. 1864, p. 499.

ROSORES.

Hr. Malmgren states that not a single species of this order is found in Spitzbergen, and that especially *Lemmus hudsonius* does not extend to this island as other authors have believed. Wieg. Arch. 1864, p. 85. (Cefvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 145.)

Mus. Prof. Troschel has made some remarks on osteological differences between the German species of Rats and Mice. Verhand. ntrhist. Vereins Preuss. Rheinl. u. Westph. 1864, xxi. p. 111.

Mus coninga, sp. n., Swinhoe, Proc. Zool. Soc. 1864, May 10, p. 185, from Formosa. This species is truly indigenous in the island, but is being gradually exterminated or banished by *Mus decumanus*, like *M. rattus* and the Chinese *M. flavesceus*.

Mus zebra, sp. n., Heuglin, Nov. Act. Acad. Carol. Leop. Nat. Cur. xxiii. 1864, p. 10, from Central Africa.

Golunda pulchella, sp. n., Gray, Proc. Zool. Soc. 1864, p. 57, from tropical Africa.

Lemmus rufocanus and *L. norwegicus* have been found in Finmark by Dr. Malmgren, Wieg. Arch. 1864, p. 85. (Cefvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 145.)

Castor fiber. Dr. Fitzinger has published some observations on the habits of the European Beaver. Zool. Garten, 1864, p. 273.

Aulacodus semipalmatus, sp. n., Heuglin, Nov. Act. Acad. Carol. Leop. Nat. Cur. xxiii. 1864, p. 5, from Central Africa; with a figure of the skull.

Hydrochaerus capybara. Dr. Böcking has published his observations on the habits of this animal in Wieg. Arch. 1864, p. 32.

Lepus variabilis. Two pairs of this species were introduced into Stromö (Faroe) from Norway, in 1854 or 1855; they have increased so rapidly that there are thousands now in the island. Letter from Mr. Muller, Ann. and Mag. Nat. Hist. 1864, xiv. p. 461.

Lagomys princeps. Dr. Cooper remarks that this rare animal lives about the limits of perpetual snow on the Sierra Nevada, but is very rarely seen. He found it quite common in a very limited district, though difficult to obtain, from its extreme shyness. Though before found in the Rocky Mountains near South Pass, and Salt Lake, where it is called "Coney," this is the first record of its occurrence so far to the west and south. Proc. Calif. Acad. Nat. Sc. iii. p. 69.

Meriones macropus, sp. n., Heuglin, Nov. Act. Acad. Carol. Leop. Nat. Cur. xxiii. 1864, p. 9, from Central Africa.

Sciurus ornatus, sp. n., Gray, Proc. Zool. Soc. 1864, p. 13, pl. 1, from Natal.

Haplodon = *Aplodontia* (Richards.). Prof. Peters agrees with Brandt, who considers this genus as the type of a separate subfamily of *Sciurini*, distinguished by teeth without roots, whilst Baird associated it with the Beaver.

The specimen described is from California, and differs in several points from *H. leporinus*. Monatsber. Acad. Wiss. Berl. 1864, p. 177.

Georychus. Dr. Gray (Proc. Zool. Soc. 1864, p. 123) proposes a further subdivision of this genus, and mentions one or two new species from Eastern tropical Africa.

1. The name of *Georychus* is retained for species with three molars above and below; the species are *G. capensis* (Pall.) and *G. albifrons*, sp. n.

2. The species with four molars in each jaw are arranged according to the size and form of the molars:

a. *Heliophobius* (Peters?). The author has some doubt whether the only species known to him—*Georychus pallidus* (sp. n.?)—be not identical with *Heliophobius* (*Bathyergus*) *argenteo-cinereus* (Peters).

b. *Cryptomys*, Gray; type *G. holosericeus* (Wagn.).

c. *Cetomys*, Gray; type *Bathyergus cecutiens* (Licht.).

Georychus ochraceo-cinereus, sp. n., Heuglin, Nov. Act. Acad. Cæs. Carol. Leop. Nat. Cur. xxiii. 1864, p. 3, from the Bahr el ghasal.

Geomys heterodus, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 177, from Costa Rica.

EDENTATA.

Prof. Peters (Monatsber. Acad. Wiss. Berl. 1864) describes the following new species: *Dasypus pentadactylus* from British Guiana, p. 179; *D. fenestratus* from Costa Rica, p. 180. Another Mexican Armadillo is a variety of *D. novemcinctus*.

Dasypus peba (Burm.). Prof. Peters has found that the *Dasypus kappleri* of Krauss is identical with this species, and that Krauss has described the true *D. peba* as *D. longicaudatus*. Monatsber. Acad. Wiss. Berl. 1864, p. 179.

Bradypus torquatus. Prof. Peters proposes the generic name of *Sœopus*, if it should be thought necessary to separate this species from the other *Bradypus*. Monatsber. Acad. Wiss. Berl. 1864, p. 678.

Cholæpus hoffmanni. Peters has examined six skeletons of this species, and found in all six cervical vertebrae only. There is in this family a great tendency to anchylosis of the various parts of the skeleton. Monatsber. Acad. Wiss. Berl. 1864, p. 678.

PACHYDERMATA.

Dr. Fitzinger has written a paper in which he gives full descriptions of the species of pigs (*Setigera*) (Sitzgsber. Akad. Wiss. Wien, vol. 50); also the synonyms of the different species are added. No new species is described; *Sus ceylonensis* of Blyth is considered to be probably identical with *Sus barbatus* (S. Müll.) from Borneo. The author admits 9 species of *Sus*, 2 of *Potamochoærus*, 2 of *Porcula*, 2 of *Phacochoærus*, 1 of *Porcus* (*Babyrussa*), and 2 of *Dicotyles*. For *Centuriosus pliciceps* (Gray), he has invented the new name of *Ptychochoærus plicifrons*, and supposes that this pig is not from China or Japan, but from Abyssinia—an opinion founded on a very vague statement by the traveller von Heuglin, and already contradicted by Dr. Gray

and Dr. Sclater, the former being, moreover, of opinion that Dr. Fitzinger has not had for examination the pure breed of *Centuriosus*, but a cross-breed with the common European pig.

Porcula taiwana (Swinhoe) appears to be a very doubtful species; it ought to be referred to *Sus*, and requires further comparison with *Sus leucomystax* (Schleg.). Swinhoe, Proc. Zool. Soc. 1864, pp. 381 & 382.

Phacochoerus celiani. Prof. Hyrtl describes retia mirabilia in the extremities. Denkschr. Acad. Wiss. Wien, 1864, xxii. p. 143.

Hyrax capensis. Prof. Hyrtl describes retia mirabilia in the extremities. Denkschr. Acad. Wiss. Wien, 1864, xxii. p. 140.

RUMINANTIA.

One of the most important contributions to the knowledge of Mammals which we have to record during this year is the memoir on the Musk-deer (Chevrotains) by M. A. Milne-Edwards, Ann. Sc. Nat. 1864, ii. pp. 49-167. The author treats his subject most exhaustively, and has diligently collected and critically examined the whole literature relating to it. He fully describes the zoological characters, enters into the anatomy as far as the materials of the collections of Paris, Leyden, and London allow, compares the peculiarities of the anatomical structure with those of allied groups of Ruminantia, and, finally, examines the fossil remains which justly or erroneously have been referred to this group. He is inclined to reduce considerably the number of species; and we fully concur with M. Milne-Edwards when slight external differences are not accompanied by osteological characters. He has had many opportunities of examining the skeletons, or at least the skulls; and with such materials it appears less hazardous to declare certain species to be mere varieties, as recent investigations into the osteology of other groups of Mammalia have revealed unexpected and well-marked characters between individuals which externally are very similar to one another. The paper is accompanied by eleven plates, two of which contain coloured figures of the different species, whilst the others are devoted to parts of the skeletons and to the internal organs. On one plate the brain of several species is figured.

The following are the main points of M. Milne-Edwards's memoir:—

1. He admits three genera: *Moschus*, *Tragulus* (including *Meminna*, Gray), and *Hyæmoschus* (Gray).
2. The genus *Moschus* has one species only, *M. moschiferus*.
3. *Tragulus* is distinguished by having the median metacarpals united into a cannon bone; the intermaxillaries are in contact with the nasal bones. To this genus belong *T. javanicus* (Pall.), *T. napu* (Raffles), *T. kanchil* (Raffles) including *T. pygmaeus* (Gray), *T. stanleyanus* (Gray), and *T. meminna* (Exl.).

4. *Hyaemoschus* (Gray) is characterized by having the median metacarpals separate at all ages; and the intermaxillaries are not in contact with the nasal bones. The author agrees with Pomel that the fossil *Dicrocerus crassus* (Lartet) should be referred to this genus, but hesitates to admit the other fossil remains which have been included in this group by various authors.

5. The animals mentioned ought to be divided into two distinct groups: the *Moschidæ* with the genus *Moschus*, and the *Tragulidæ* with the two other genera.

6. The *Moschidæ* are more closely allied to the *Cervidæ* than to the *Tragulidæ*. The placenta is divided into a great number of cotyledons; stomach quadripartite. Frontal excrescences none. Formula of the teeth: inc. $\frac{0-0}{4-4}$; can. $\frac{1-1}{0-0}$; mol. $\frac{6-6}{6-6}$. Canine teeth much developed in the male; incisors in a continuous series, subequal in size. Male with a pouch secreting musk.

7. The ground upon which the author separates the *Tragulidæ* is the difference of the placental connexion of their embryo with the uterus: the placenta is not divided into cotyledons, but it is diffuse, the entire ovum being covered with villi, as in the Hog, Camel, and Horse; there is no membrana caduca. The stomach is tripartite. The male has no musk-secreting apparatus. Teeth as in the *Moschidæ*, but the median incisors are enlarged and separated by an interspace.

Dr. Blyth agrees with M. Milne-Edwards that *Meminna* (Gray) should be reunited with *Tragulus*, that *M. malaccensis* (Gray) does not differ from *Tragulus indicus* (Gray), and that *T. pelandoc* (Blyth) should properly be named *T. javanicus*; he adds some further remarks on the geographical distribution of the species and their varieties. Proc. Zool. Soc. 1864, p. 482.

Camelus bactrianus. The measurements of a young animal born in the Frankfurt Zoological Garden are given in Zoolog. Garten, 1864, p. 83.

Auchenia alpaca. The "Société Impériale Zoologique d'Acclimatation" are endeavouring to introduce the Llama into France, and to render it a really useful animal in the different parts of the French Empire. With the aid of the Imperial Government they have succeeded in making a fresh importation from Peru of twenty-six head. The reports of the Commanders of the two vessels to whom the transport was entrusted, and a report on the animals themselves by M. A. Geoffroy St.-Hilaire, are published in the "Bulletin mensuel," 1864, pp. 321, 393 & 397. M. Ruz de Lavison has given on this occasion an historical account of different attempts made (chiefly in France) to introduce the Llama into Europe (p. 327); it would appear that there are, at present, in Europe 104 Llamas, 4 Alpacas, and 11 Guanacos.

Cervus. Mr. Swinhoe enumerates in a letter the Deer of China, nine in number, proposing for one of them the name of *Cervus hortulorum*, and for another that of *C. manchuricus*. Proc. Zool. Soc. 1864, p. 169.

Rangifer tarandus. Mr. Newton found the Rein-deer tolerably abundant in Spitzbergen, and noticed that they are smaller than Lap-deer, their antlers being similar to those of arctic North America. Proc. Zool. Soc. 1864, p. 495.—Hr. Malmgren has made the same observation, Wiegman Arch. 1864, p. 87.

Camelopardalis. Dr. Crisp makes some further observations on the Anatomy

of the Giraffe, chiefly relating to the intestinal tract and the heart; the young has the heart-bone not developed, whilst it is nearly an inch long in old individuals. Proc. Zool. Soc. 1864, p. 269.

Kobus sing-sing (Bénn.). Dr. Sclater considers two heads of Antelopes brought by Speke from Uganda as probably belonging to this species; the head and foot are figured. Proc. Zool. Soc. 1864, p. 102.

Tragelaphus spekii, sp. n., Sclater, Proc. Zool. Soc. 1864, p. 103, pl. 12, from Eastern tropical Africa.

Oreas livingstonii, sp. n., Sclater, Proc. Zool. Soc. 1864, p. 105, from tropical Africa. No specimen of this species has hitherto reached Europe; but Livingstone, Kirk, and Speke, who have observed it, agree that it is distinguished from the common Eland by having white cross stripes on the flanks. —Dr. Kirk is, for the present, inclined to regard it as a variety of *Oreas canna*. Proc. Zool. Soc. 1864, p. 659.

Nesotragus livingstonianus, sp. n., Kirk, Proc. Zool. Soc. 1864, p. 657, from the Zambesi; probably identical with the Antelope mentioned by Prof. Peters under the name of *N. moschatus*.

Antelope picta. Dr. Crisp mentions a large glandular patch near to the cæcum, and makes some further observations on the intestinal tract of this and other Antelopes. Proc. Zool. Soc. 1864, p. 270.

Dr. Blyth makes some remarks on the "*Unicorn Goat of Tibet*," Proc. Zool. Soc. 1864, p. 485.

Ovis musimon. His Highness Prince P. N. Bonaparte has read before the Society of Acclimatization of Paris, observations on the Mouflon of Corsica, and on the different methods of its chase. He does not consider it to be the progenitor of the domestic Sheep, but thinks it more nearly allied to the Antelope, to the Chamois. It can be crossed with the Sheep and Goat, and the cross breeds are fertile. The Prince has no doubt that it could be also crossed with the Gazelle. Bull. mens. Soc. Acclim. 1864, p. 389.

Bos taurus. Messrs. Mennell and Perkins have collected the evidence in favour of the opinion that the wild cattle of Chillingham are the descendants of the aboriginal British race, and that they were not introduced by the Romans. Trans. Tyneside Nat. Field Club, 1864, p. 140.

CETACEA.

SIRENIA.

Manatus. Prof. Brandt (Bull. Acad. Sc. St. Pétersb. v. p. 7) was inclined to regard the seventh vertebra as belonging to the cervical series, so that its relation to the first rib must be interpreted as a simple anomaly. Against this opinion Mr. Flower, who has compared the vertebræ of *Manatus americanus* with those of *Halicore indica*, urges that morphologically the third, fourth, and fifth vertebræ in both animals agree, that the sixth and seventh of *Manatus* may be clearly recognized in the seventh and eighth of *Halicore*, but that there is no vertebra in *Manatus* which would correspond to the sixth of *Halicore*. Therefore he prefers to adopt De Blainville's view that this vertebra is lost in *Manatus*, although he is not prepared to explain its absence in the same way. Nat. Hist. Rev. 1864, p. 259.

CETE.

Prof. von Baer has again directed our attention to an opinion which he has held for many years, and in which he is supported by direct observations made by himself as well as by others, viz. that Cetaceans do not eject water from their blowholes, but air saturated with water. In calm weather, it may be seen how the column of vapour rising from the blowholes expands at the top and gradually disappears; it has never been seen falling back into the water, as would be the case if it were formed by water. Bull. Acad. Sc. St. Pétersb. vii. 1864, p. 333.

Dr. Gray has given an elaborate account of the Cetaceans which have been observed in the seas surrounding the British Islands, Proc. Zool. Soc. 1864, p. 195. After some introductory remarks on the difficulty of obtaining and observing specimens, and on the literature relating to these animals, he states that whilst Turton had indicated only eighteen British species, this number is increased in this paper to thirty [twenty-nine], belonging to twenty genera. Schlegel enumerates ten Dutch, and Nilsson sixteen Scandinavian species. The genera and species are differentiated chiefly by osteological characters. "The careful examination," the author says, p. 229, "of many skeletons has proved to me that almost every bone of each genus is peculiar—that is to say, that no bone is exactly alike in any two genera; but the difference between them is often very slight, so slight that it would be almost impossible to convey an accurate conception of it to the reader by words alone, yet it is permanent and characteristic. Though the same bones of the different skeletons of the same species of *Megaptera* or *Physalus*, which I have examined, offer a certain amount of variation in minor particulars, yet almost every bone of each species has a character of its own, so that a person conversant with the subject, and fresh from the study and comparison, can say at once to which genus or species any bone that might be shown to him belongs, even if it were only a phalange or a rib." Many of the species are illustrated by woodcuts representing their tympanic bones, cervical vertebræ, or ribs; and, to all, notes have been added on those points with which the author has become better acquainted since the publication of his "Catalogue of Cetacea." The most characteristic parts have been found to be the cervical vertebræ, the ribs, and tympanic bones. The systematic arrangement differs from that proposed in the "Catalogue of Cetacea" chiefly in a further subdivision of the different groups, so that genera previously adopted are split into subgenera (which rank as genera), and themselves are raised to the rank of families. The new arrangement is as follows:

I. Suborder CETE, as before.

Sect. I. MYSTICETE, = fam. BALÆNIDÆ of Cat. Cetac.

Fam. 1. BALÆNIDÆ, = gen. BALÆNA of C. C.

1. *Balæna*, type *B. mysticetus*.
2. *Eubalæna*, type *B. australis*.
3. *Caperea*, type *B. antipodarum*.

Fam. 2. BALÆNOPTERIDÆ.

a. *Megapterina*, = gen. *Megaptera* of C. C.

1. *Megaptera*, type *M. longimana*.
2. *Pæscopia*, type *Balæna lalandii* (Fisch.); to this division belongs also a new species, *Megaptera novæ zelandiæ*, p. 207, known from the tympanic bones only.

b. *Physalina*.

- | | | |
|--|---|--|
| = gen.
<i>Physalus</i>
of Cat.
Cetac. | { | 3. <i>Benedenia</i> , type <i>B. Knoxii</i> , formerly described as <i>Physalus boops</i> (Gray). |
| | | 4. <i>Physalus</i> , type <i>Ph. antiquorum</i> . |
| | | 5. <i>Sibbaldus</i> , type <i>Balenoptera laticeps</i> (Gray); to this genus also belongs <i>S. borealis</i> (part., Fisch.), the synonymy of which is fully worked out. |
| | | 6. <i>Balenoptera</i> , type <i>B. rostrata</i> . |

Sect. II. DENTICETE, comprising the families of CATODONTIDÆ and DELPHINIDÆ of Cat. Cetac.

Fam. 3. CATODONTIDÆ, remains unchanged.

a. *Delphinina*.

1. *Steno*.
2. *Delphinus*, further subdivided into *Delphis* (type *D. delphis*), *Clymene* (type *D. euphrosyne*), *Tursio* (type *D. tursio*).
3. *Lagenorhynchus*.

b. *Hyperodontina*.

4. *Hyperodon*, type *H. butzkopf*.
5. *Lagenocetus*, type *H. latifrons*.

c. *Ziphiina*.

6. *Ziphius*.
(*Aliaia*, type *A. desmarestii*, from the Mediterranean).

d. *Globiocephalina*.

7. *Globiocephalus*.

e. *Phocænina*.

8. *Orca*; 9. *Grampus*; 10. *Phocæna*; 11. *Beluga*; 12. *Monodon*.

II. Suborder SIRENIA.

A single specimen of a *Manatus* appears to have found its way to the Shetland Islands.

In a second paper (Ann. & Mag. Nat. Hist. 1864, xiv. p. 345), Dr. Gray gives a Synopsis of the tribes, genera, and species of Whalebone-Whales (*Mysticete*, *Balænidæ*), characterizing the tribes and genera. He observes that in very young specimens and in the foetus the head is comparatively not so large as in the adult. It also appears that certain parts which become ossified in most kinds of Whalebone-Whales do not become so in others. Thus the lateral processes of the cervical vertebrae of *Megaptera*, *Benedenia*, and *Physalus* seem to be nearly of the same form in the young and cartilaginous state; that is to say,

they have the usual form of these bones in the *Balenopteridæ*; and though the entire lateral process becomes ossified in *Physalus* and *Sibbaldius*, the end of the process remains cartilaginous at least to a much greater age, if not always, in the genera *Megaptera* and *Benedenia*. Therefore this apparently imperfect development and truncated form of the bones is a peculiarity of the genera, and does not arise from the youth of the specimens observed. Further, the fact that some species have the first rib furnished with a double head, one head attached to the last cervical, and the other to the first dorsal vertebra, though considered by Schlegel as only to be found in the young state of the species, disappearing as the animal increases in age, proves to be a permanent peculiarity of considerable importance.

The arrangement is nearly the same as that proposed in the preceding paper, with the following additions:

Hunterus (p. 349) is a fourth genus of Fam. I. *Balanidæ*, and distinguished from the three others in having fifteen ribs, the first double-headed; tympanic bones rhombic, nearly like those of *Balæna*; head large, forming above one-fourth of the entire length of the adult. The typical species is *Balæna mysticetus australis* (Schleg.) or *Hunterus temminckii* (Gray).—The Whalebone-Whale of the North Pacific, figured in the 'Fauna Japonica' under the name of *Balæna australis*, but afterwards named by Dr. Gray *B. japonica*, must receive another name, the latter being preoccupied. He now proposes to call it *Balæna sieboldii*; its position in the system is still unknown, no remains of it having been sent to Europe.

The genus *Pæscopia* is again divided; and the characters of the genera of *Megapterina* would be as follows:

a. Blade-bone without any acromion or coracoid process; the bodies of the cervical vertebræ subcircular; arm-bones broad: *Megaptera* (*Balæna longimana*, Rud.).

b. Blade-bone with a small coracoid process; the bodies of the cervical vertebræ nearly square, with the angles rounded: *Pæscopia* (*Balæna lalandii*, Fisch.).

c. Blade-bone with a distinct acromion and coracoid process; arm-bones more slender; fingers — ? : *Eschrichtius* (p. 350), with the species *Balenoptera robusta* (Lilljeb.) and *Megaptera novæ zelandiæ* (Gray).

Subsequently, Proc. Zool. Soc. 1864, p. 587, Dr. Gray received the photographs of the cervical vertebræ of a Right Whale, preserved in the Museum of Sydney; he has recognized in these remains a new generic form, for which he proposes the name of *Macleayius australiensis*. He says that the genera of large Whales may always be recognized from the cervical vertebræ, and arranged according to this character thus:

I. The neural arch with a strong, well-developed ridge on its upper edge, forming a keeled crest.

A. The lateral processes of the atlas on the upper part of the side. *Balænidæ*.

1. The atlas coalesced with the other cervical vertebræ into one mass.
 - a. The lateral processes of the atlas conical. *Balæna*.
 - b. The lateral processes of the atlas rather broad, rounded, shorter below. *Eubalæna*.

2. The atlas free from, and separate from, the other cervical vertebræ. *Macleayius*.

B. The lateral process of the atlas and other cervical vertebræ on the lower part of the side of the body. *Hyperodon* and *Lagenocetus*.

II. The neural arch low, scarcely raised, keeled on the upper edge; the lateral processes very wide, occupying nearly the whole side-edge of the body of the vertebræ. Atlas separate, free. *Catodontida*.

The paper is illustrated by figures of the cervical vertebræ of the new species, of *Catodon australis*, and of *Lagenocetus latifrons*.

Mr. Flower has made important communications on the skeletons of Whales in the Dutch and Belgian collections, Proc. Zool. Soc. 1864, p. 384. He commences his memoir with general observations on the method to be followed in the examination of skeletons of Cetaceans. The alterations, he says, which take place in the bones at different periods of life, render it an object of primary importance to ascertain as near as may be, the relative age of the individual under examination. He distinguishes three stages of growth:—I. *Very young* and *young stage*: all the epiphyses of the vertebral column, and of both ends of the humerus, radius, and ulna are still separate, and the processes of the vertebræ are obviously unfinished, abruptly and roughly truncated. The animal remains in this condition until it has attained to more than half the length of the adult. II. *Adolescent stage*: both epiphyses of the humerus, those of the upper end of the radius and ulna, and those of the bodies of the *anterior cervical* and the *posterior caudal* vertebræ are united, while those of the greater part of the column are still free. III. *Adult stage*: all the vertebral epiphyses are ankylosed.

The obliteration of the sutures of the cranium affords comparatively much less indication as to age, the majority of the bones remaining distinct throughout life.

The author then shows that the amount of variation found among different individuals of the same species is much less than was formerly supposed, as long as many species were thrown together into one. As regards size, the adult animals of *Balæna mysticetus* have a tolerably limited range of variation within a few feet of either side of 55': *Balænoptera rostrata* does not appear to exceed 31'; *Megaptera longimana* between 45' and 50'; *Physalus antiquorum* between 60' and 70'. There is scarcely any variation in the number of vertebræ and ribs, provided the skeleton is complete: *Balænoptera rostrata* has 48 or 50 vertebræ, and 11 pairs of ribs; *Physalus antiquorum* 61 or 62 vertebræ and 15 ribs; *Megaptera longimana* 53 vertebræ and 14 ribs; *Balæna mysticetus* 54 vertebræ and 12–13 ribs.

The author adopts the distribution of these Cetaceans into groups and genera which has been proposed by Eschricht, and by Gray in the memoir of which an abstract is given above; but he has worked out the characters more completely, and for them we must refer to the paper itself.

The specimens examined and described are the following :

1. *Balæna mysticetus*: skull, Leyden (p. 394); skeleton, Brussels (p. 416).
2. *Eubalæna australis* (?): skeleton and skull, Leyden (p. 394); skull, Louvain.
3. *Megaptera longimana*: skeletons in Leyden (p. 397), Brussels (p. 416), and Louvain (p. 418).
4. *Physalus antiquorum*: skeletons in Antwerp (p. 414) and in the Hague (p. 409); skulls in Leyden and Louvain.
5. *Physalus latirostris*, sp. n., p. 410, from the coast of Holland: skeleton in Utrecht.
6. *Sibbaldius laticeps*: skeleton in Leyden (p. 397), the identical specimen of No. 17 of Eschricht's list in 'Untersuch. über Nord. Walthiere.' Another skeleton in Brussels (p. 417).
7. *Sibbaldius schlegelii*, sp. n., p. 400, from the north-west coast of Java: skeleton in Leyden; a skull of a very young Whale, also from Java, in the Leyden Museum, probably belongs to the same species (p. 408).
8. *Balenoptera rostrata*: two skeletons in Leyden (p. 409), two in Brussels (p. 418); and one and a skull in Louvain (p. 418).

M. Paul Gervais enumerates the species which have been observed at different times on the French coasts of the Mediterranean (Compt. Rend. 1864, ii. p. 876); the author distinguishes the following species :

1. *Physeter macrocephalus*. Very rare. A part of the lower jaw is preserved in the collection of the "Pères Maristes, à la Seyne" near Toulon.
2. *Ziphius cavirostris* (Cuv.). The recent specimens found of this species, which has for a long time been considered extinct, have become types several nominal species, viz. *Delphinus desmarestii* (Risso), *Delphinus philippii* (Cocco), *Hyperoodon doumetii* (Gray), *Hyperoodon gervaisii* (Duvernoy).
3. *Orca gladiator*. Two specimens are referred to this species, one with $\frac{11}{12}$ teeth; of the second, only the lower jaw is preserved, and as it has six teeth only on each side, its specific determination is rather uncertain.
4. A species belonging to the genus *Globocephalus* has been recognized by M. Gervais; he considers it as scarcely distinct from the Pilot-Whale (*G. suineval*), differing from it in the curvature of the external edge of the intermaxillary bones and in the teeth being a little more obtuse. It is black, with a white longitudinal band on the belly, commencing at the throat, where it is heart-shaped, and extending on to the vent.
5. *Grampus rissouus* (Cuv.). Hitherto found in the Mediterranean only.
6. *Delphinus (Tursiops) tursio*. Tolerably common.
7. *Delphinus delphis*.
8. *Delphinus tethyos*, Gervais in Bull. Soc. Agricult. de l'Hérault, 2nd ser. t. xx. p. 289, and Zool. et Paléont. Franç. p. 302. Known from two examples only.

9. *Rorqualus (Physalus) antiquorum*. Not very rare.

M. Jouan records the capture of a Whale which he has determined as *Rorqualus musculus*, on the coast of Cannes (South of France), in May 1864. Mém. Soc. Sc. Nat. Cherbourg, 1864.

Balæna. Dr. Gray makes some observations on a singular horny excrescence on the skin of the jaws of some Whales, called "bonnet" by the whalers. He gives the different opinions on its origin, and believes that a prominence of this kind is to be observed in all the species of the genus *Balæna*, although it may be of various form and texture. Proc. Zool. Soc. 1864, p. 170.

Balæna mysticetus. Prof. Eschricht has given an account of the annual migration of this species, based upon observations continued during thirty-five years at different stations on the coast of Greenland; it arrives there in the beginning of December, and in its return northwards leaves again the seas in 66° 56' N. lat. in March, and those in 69° lat. in the month of May.

Balænoptera rostrata (Fabr.). Mr. Flower has given a most accurate description of the skeleton of a male specimen, 24½ feet long, which was washed ashore on the Norfolk coast in 1860, and which fortunately fell into the hands of Mr. J. H. Gurney, who, with a rare love for natural science, is always ready to promote its advancement. In the course of the description, the author points out several differences between his specimen and those previously described; but they are probably merely individual characters, and, moreover, Dr. Gray refers the specimen to the same species as Mr. Flower. He is inclined to regard the number of vertebræ as constant in a species, that of *Balænoptera rostrata* being fifty. Proc. Zool. Soc. 1864, p. 252.

The capture of a specimen of the same species off the coast of Northumberland on the 6th of February 1858, with the measurements given by Mr. J. Hancock, is recorded by Messrs. Mennell and Perkins in Trans. Tyneside Nat. Field Club, 1864, p. 160.

Balænoptera gigas. Hr. Malmgren supposes that he has once seen this species in the sea of Spitsbergen, and that it sometimes occurs on the coast of Finmark. Wieg. Arch. 1864, p. 94 (Öfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 153).

Hyperodon rostratus (Pontopp.). This species, named "Dögling" by the Scandinavians, was observed by Hr. Malmgren between 74° 5' and 76° 5' lat. N., and 12° and 13° long. E. They were seen in water of a temperature of from 2° to 3° R., but disappeared when the temperature fell to the freezing-point. Wieg. Arch. 1864, p. 93 (Öfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 150).

Ziphius indicus, sp. n., Van Beneden, Mém. Cour. Acad. Sc. Belgique, 1864, xvi., from the Cape of Good Hope. Only the skull is known, which is fully described and figured.

Mesoplodon souciebiensis. M. Van Beneden has given the history of our knowledge of this species, and a detailed description of its skeleton, in Mém. Cour. Acad. Sc. Belg. 1864, xvi. The skeleton is figured.

Monodon monoceros. The Narhval leaves Spitsbergen in summer for more

northern and colder latitudes. Malmgren, in Wiegman. Arch. 1864, p. 91 (Oefvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 150).

Beluga catodon (L.) or *Beluga borealis* (Less.). Prof. J. Wyman has examined and dissected a male specimen, which has been on public exhibition in a water-tank for nearly two years. He describes the external characters, the dentition, parts of the skeleton, and the internal organs. As far as we know, this is the first instance of a Cetacean having been kept in captivity for any length of time; and it is interesting to hear that it showed some capacity for education. The proprietor stated that this white Whale was less docile than the *Delphinus tursio* who was for a time a companion with him in the tank. The animal was ten feet long. Bost. Journ. Nat. Hist. vii. p. 603, pl. 12.

The Beluga is common on the coast of Spitsbergen and in the White Sea. Malmgren, in Wiegman. Arch. 1864, p. 90 (Oefvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 149).

Phocæna communis. Dr. Crisp has dissected a specimen, 3 feet long; the intestinal canal measured 56 feet 3 inches, and the brain weighed 16 ounces. Proc. Zool. Soc. 1864, p. 17.

Globiocephalus. M. Van Beneden gives an account of a Cetacean thrown on shore near Antwerp the 27th of April 1864. He has identified it with *Delphinus melas* (*D. globiceps*, Cuv.; *Globiocephalus svineval*, Gray). As regards the occurrence of this species in the Mediterranean (see Gervais's paper, p. 36), the author thinks it possible that the specimens observed on that coast should be referred to *Delphinus feres* (Bonnat.). Bull. Acad. Sc. etc. Belg. 1864, xvii. p. 439.

Orca meridionalis, sp. n., Flower, Proc. Zool. Soc. 1864, p. 420, from Tasmania. Two skulls in the collection of the College of Surgeons are extremely similar to that of *Orca crassidens* from the northern hemisphere. Therefore the species may probably enter Reinhardt's genus *Pseudorca*.

Lagenorhynchus leucopleurus. Dr. Duguid has given an account of the capture of a shoal of this Dolphin in the Orkney Islands, and described its external characters. Ann. & Mag. Nat. Hist. 1864, xiv. p. 133, pl. 3.

Lagenorhynchus acutus. M. Poelman describes and figures a specimen caught on the Belgian coast, under the name of *Delphinus eschrichtii*. The skeleton also is described. Bull. Acad. Sc. etc. Belg. 1864, xvii. p. 604.

Delphinus delphis. An immense shoal has been observed in the Westfjord on the coast of Norway by Malmgren, Wiegman. Arch. 1864, p. 88.

Delphinus guianensis, sp. n., Van Beneden, Mém. Cour. Acad. Sc. Belg. 1864, xvi., from Dutch Guiana; known from the skeleton only.

MARSUPIALIA et MONOTREMATA.

Halmaturus parvi. Prof. Hyrtl describes the arteries, in Denkschr. Acad. Wiss. Wien, 1864, xxii. p. 158.

Echidna. Mr. Flower has examined the brain, and found the optic lobes not essentially different from those of more highly organized mammals, the *testes* and *nates* being well developed, and separated into *corpora quadrigemina* by a longitudinal groove as well as by a transverse one. Proc. Zool. Soc. 1864, p. 18. Two views of the brain are given, one from above, and the other from the side.

AVES

BY

ALFRED NEWTON, M.A., F.L.S., etc.

No one can be more painfully aware of the many imperfections of this compilation than its author is. Yet he trusts that its shortcomings are of such a character as, with the kind assistance of his brother-ornithologists, may be ameliorated in future years; for he believes that much of its incompleteness may reasonably be ascribed to the short period which has elapsed between the commencement and execution of this 'Record'; and he would earnestly request that early notice of all papers relating to Ornithology which may appear during the present year may be sent to him, so as to render his contribution to the next volume of the 'Record' more deserving of the attention of naturalists.

BIBLIOGRAPHY.

HARTLAUB, G. Bericht über die Leistungen in der Naturgeschichte der Vögel während des Jahres 1863. Archiv für Naturgeschichte, Jahrgang xxx. Band ii. pp. 32. Berlin: 1864.

This, the *Eighteenth* Annual Report on the progress of ornithology which has proceeded from its learned author's pen, fully maintains the excellent qualities he has taught us to expect, as a matter of course, in all he publishes. On the present occasion we are glad to find Dr. Hartlaub strongly protesting against the mania of genus-making now so prevalent; but we regret to say that he is not sanguine of its early cessation. A reaction may take place when each species is put in a genus by itself. But then what is a species? This question is still unanswered. Dr. Hartlaub thinks it is only when we know "everything about every bird," that the discussion of the ideas 'Species,' 'Genus,' and 'System' will come to an end. Till then many an obtrusive "*mihi*" will strut forth with impunity. We trust, however, our author may have taken somewhat too unfavourable a view of the cause which underlies all this genus-making; if not, it is much to the discredit of ornithologists.

We cannot here refrain from stating our great obligations to Dr. Hartlaub's admirable series of "Reports," the main features of which we have not hesitated to copy in our portion of the

present 'Record,' convinced that a better model could not be adopted.

CASSIN, JOHN. *Fasti Ornithologiæ*. No. I.—Philipp Ludwig Statius Müller. *Proc. Acad. Philad.* 1864, pp. 234–257.

The author shows, and (unfortunately for the peace of mind of modern ornithologists) shows correctly, that the names bestowed by P. L. S. Müller must, according to the generally received principles of nomenclature, be adopted. They are those contained in the supplemental volume of his edition of Linnæus's '*Systema Naturæ*,' and having been published in 1776, and being strictly binomial, many of them (about 137) take precedence of those which have been commonly in use. Mr. Cassin prints a list of the names applied by Müller, adding to them those which must now be considered synonyms.

THE GENERAL SUBJECT.

DANA, JAMES A. On parallel relations of the Classes of Vertebrates, and on some characteristics of the Reptilian Birds. *Edinb. New Philos. Journal, New Series*, vol. xix. pp. 75–81. (Reprinted from the *American Journal of Science and Arts*, vol. xxxvi., Nov. 1863.)

By the term "Reptilian" or "Hemitypic" Birds—for which the name "Erpetoids" (*lege* Herpetoids) is also proposed—is meant the group to which the species known as *Archæopteryx macrura* belongs. It is inferred that the young of this group were unquestionably unfledged, and quite probable that they were more completely unfledged, or for a longer period, than the young of ordinary birds. Further, that they were unquestionably "walking chicks." It is also probable that the Herpetoids had some more profound Reptilian characteristic than those already noticed, such as incomplete circulation; and though the heart may have had its four cavities, there may have been a passage permitting the partial admixture of venous and arterial blood, such as exists not only in Crocodiles but in the young bird during an early stage in its development, and that this peculiarity may have continued on through the early part of the life of the chick, or until it was fledged.

FRAUENFELD, G. VON. Ueber Wanderung und Flug der Vögel. *Journ. f. Ornith.* 1864, pp. 101 *bis*–108 *bis* (*potius* pp. 101–108); and *Verh. Zool.-Bot. Gesellsch. Wien*, 1864, pp. 156, 157.

The author sets himself to answer three sets of questions, respecting the direction taken by migrating Swallows, put by Dr. J. de la Harpe. The replies state that these birds in many

cases seem to follow the course of rivers, and especially of the Danube. The author also adds some particulars of observations made by himself on birds of passage in Norway, and on some of the *Procellariidae* in the Southern Seas as noticed by Mr. E. L. Layard in the 'Ibis' (1862, p. 97, and 1863, p. 241).

NEWTON, ALFRED. On an Illustration of the Manner in which Birds may occasionally aid in the Dispersion of Seeds. Ann. and Mag. Nat. Hist. 3 ser. vol. xiii. pp. 99-101. (Reprinted from Proc. Zool. Soc. 1863, p. 127).

The author describes a mass of earth $7\frac{1}{2}$ inches in circumference, and weighing $6\frac{3}{4}$ oz., which had accumulated round the foot of an example of *Caccabis rufa*, and remarks that it was sufficient to hold the germs of a very extensive flora*.

SEGOND, L. A. Application des principes de morphologie à la classification des Oiseaux. Comptes Rendus de l'Acad. Franç. August 1, 1864. Rev. Zool. 1864, p. 263.

The author states that when search is made into the least variable parts of the Ornithic skeleton for the characters which will best reveal existing affinities among birds, he finds that all the species are derived either directly or by mixture (*par mélange*) from four types, of which the Eagle, the Swan, the Cock, and the Ostrich manifest the most perfect representation. In a former communication made to the Academy, M. Segond had taken the central part only of the vertebral column as a means of determining the methodical distribution of the *Mammalia*. In the class of Birds, on account of the more specialized structure of the skeleton, it is necessary to have recourse to the whole of the trunk.

WALLACE, A. R. Remarks on the Value of Osteological Characters in the Classification of Birds. Ibis, 1864, pp. 36-41.

The author shows that the remarks of M. Blanchard (Ann. des Sc. Natur. 1859, p. 75) had been anticipated by his own (Ann. Nat. Hist. 2 ser. xviii. pp. 193-216), wherein he separated from the true or normal *Passeres* every family which M. Blanchard separated—arriving in fact at nearly the same determination to which Nitzsch and Mr. Eyton, from the consideration of entirely different characters, had previously come. Mr.

* We may perhaps be excused for taking this opportunity of stating that in the autumn of 1863 the specimen mentioned above, and which was then *three years old*, was submitted to Mr. Darwin, who has been so good as to inform us that from the mass of earth 82 seeds germinated, 12 being those of monocotyledonous, and 70 of dicotyledonous plants of at least 5 different species.—A. N.

Wallace will not allow, however, that osteological characters are an all-sufficing guide, believing that the whole structure of a bird and its corresponding habits may be profoundly modified, while its sternum may closely resemble a common form, and *vice versâ*. He is also now quite convinced that the *Psittaci* deserve to rank as a primary division of the class of Birds. After remarking more particularly upon M. Blanchard's determination, from the body of the sternum only, of the affinities of *Merops*, *Tamatia*, the *Picidæ*, *Pteroglossus*, *Megalama*, and *Nyctiornis*, he states that the comparison of the entire sternum, with its appendages, and also of the cranium would afford a more satisfactory basis than that proposed by M. Blanchard, and considers that the texture of the plumage, the form and arrangement of the feathers, and many other characters are of almost equal importance.

PALÆARCTIC REGION.

COLLETT, ROBERT. Oversigt af Christiania Omegns ornithologiske Fauna. Christiania: 1864. Nyt Mag. for Naturvidensk. Physiogr. Forening, iii. part 3. pp. 231.

Two hundred and thirty species have been noticed as occurring, and 169 as breeding in the district, out of the 244 of which the Norwegian avifauna consists. The paper is not entirely free from errors (*cf.* 'Ibis,' 1865, p. 227); but a good deal of care and labour have obviously been expended upon it, and, as it is nearly twenty years since any publication on the *Ornis* of the district appeared, Mr. Collett's observations are not without their use.

DU BOIS, C. F. Planches Coloriées des Oiseaux de l'Europe et de leurs œufs, espèces non observées en Belgique. Bruxelles: 1864.

This work is only known to us from the critical remarks in the 'Ibis' (1864, p. 396). It appears to be supplementary to the author's 'Oiseaux de Belgique,' and its excellence is not very highly spoken of by the reviewer.

FRITSCH, ANTON. Naturgeschichte der Vögel Europas. Heft 9. Prag: 1864. Folio.

Of this work we have only seen some of the earlier parts. We extract the information above given from Zuchold's 'Bibliotheca Historico-Naturalis,' July-December 1864.

GOULD, JOHN. The Birds of Great Britain. Parts v. and vi. London: 1864. Imperial folio.

This grand work, which was begun in 1862, is continued at

the rate of two parts every year. The plates, as regards beauty and finish, far exceed those in any other of the author's well-known publications. The species illustrated will be found noticed under the groups to which they belong. A good deal of care has been bestowed on the letter-press, which is much more comprehensive than in the majority of Mr. Gould's books. Figures of the nestlings of many of the species are also introduced, to an extent greater than in any other work of the kind with which we are acquainted, excepting perhaps Naumann's 'Vögel Deutschlands.'

HINTZ, I. W. Ornithologischer Jahresbericht u. s. w. in der Umgegend von Schlosskämpfen bei Cöslin in Pommern. Journ. f. Orn. 1864, pp. 33-52, pp. 105-101 *bis* (*potius* pp. 89-101), pp. 161-194.

This report, extending over the two years 1862 and 1863, contains observations on the arrival and autumnal passage of migratory birds, with remarks on their time of breeding, the whole accompanied by meteorological statistics. The species observed for the first time breeding in the district were *Calamohërpe turdina* in 1862, and in 1863 *Picus minor* and *Ædicnemus crepitans*.

HOMER, ALEXANDER VON. Balearen und Algier. Journ. f. Orn. 1864, pp. 321-328.

Additional observations to those recorded in the author's former papers (J. f. O. 1862, pp. 1-23, 241-285, 417-434; 1863, pp. 81-99, 261-269, and Ber. xiv. Versamml. D. O. G. pp. 12-22, 24-28).

MARCHAND, ARMAND. Catalogue des Oiseaux observés dans le département d'Eure-et-Loire. Rev. et Mag. de Zoologie, 1864, pp. 3, 4, 33-36, 378-385.

These are in continuation of a series of articles commenced by the author in the same periodical for 1863 (pp. 177-179, 281-284, 334-336, 361-365). Not much important information is contained in them, but any facts showing the distribution and range of birds in France are not without value.

NEWTON, ALFRED. Notes on the Ornithology of Iceland. Zoologist, pp. 8935-8944. (From Appendix A. to 'Iceland; its Scenes and Sagas.' By Sabine Baring-Gould. London: 1863, pp. 379-421.)

The portion of the paper reprinted consists of general remarks on the character and more prominent features of the Icelandic avifauna, followed by an abstract of the author's list of the species which compose it. Some errors in this last are corrected further on (pp. 8964 and 9038).

Additions to the list are made by the author, 'Ibis,' 1864, pp. 131-133.

NEWTON, ALFRED. Two Days at Madeira. Zoologist, pp. 9179-9188. (From the 'Ibis,' 1863, pp. 185-195.)

A few general remarks on the peculiarities of the Madeiran avifauna, and notes of the species observed during the author's short visit to that island.

NEWTON, ALFRED. Notes on the Zoology of Spitsbergen. Proc. Zool. Soc. 1864, pp. 494-502.

The author stayed about six weeks in and about Spitsbergen in the summer of 1864, and records a few ornithological facts which he was able to ascertain during that time.

NORDMANN, ARTHUR VON. Uebersicht der bis jetzt in Finnland und Lappland vorgekommenen Vögelarten. Journ. f. Orn. 1864, pp. 353-382.

A reprint from the 'Bulletin de l'Académie Impériale des Naturalistes de Moscou' for 1860 (p. 1). Some observations are added by the author's father, Professor Alexander von Nordmann. Two hundred and fifty-three species are enumerated; but one of the most remarkable of the birds of Northern Lapland, *Limicola pygmaea* (*Tringa platyrhyncha*, Temm.), is not included. The interior of Finland seems not yet thoroughly explored. This paper, however, gives by far the most complete list of the avifauna of the country that has hitherto appeared. To it is prefixed a catalogue of former publications on the same subject. (Cf. 'Ibis,' 1861, pp. 109-111.)

PELZELN, A. VON. Ueber die ornithologische Ausbeute von Herrn Zelebor's Reisen in das Banat, die Militair-Grenze und die Dobrudscha. Journ. f. Orn. 1864, pp. 69-74.

The booty obtained by Herr Zelebor, though not inconsiderable as to quantity, was of far greater importance in the quality of the specimens, which consisted for the most part of very interesting species. Extracts from Herr Zelebor's letters written from different places in the course of his journey are printed in the Vienna 'Jagd-Zeitung' for 1864, pp. 40-46, 357, 358, and 390-392. (Cf. 'Ibis,' 1865, p. 225.)

SALVADORI, TOMMASO. Catalogo degli Uccelli di Sardegna, con note e osservazioni. Milano: 1864. Atti della Soc. Ital. di Sc. Nat. vol. vi. pp. 40-66, 193-228.

Two hundred and sixty-eight species are enumerated as having been found in the island of Sardinia. Of these, two hundred and fifty-one are common to the present work and that of Sig. Cara, though Sig. Salvadori has failed in being able to prove the

existence of fifteen of them. Two more have been mistaken by Sig. Cara, and twelve have been introduced wrongly by him into the Sardinian avifauna, while on the other hand, Sig. Salvadori includes fifteen species which were omitted altogether by his precursor.

SAXBY, HENRY L. Ornithological Notes from Shetland. *Zoologist*, pp. 9091-9096, 9124-9131, 9230-9243, 9310-9321.

This series of papers contains innumerable observations on the birds of the Shetlands; and, as the author resides upon Unst, the most northern of the British Isles, he is very favourably situated for noticing the occurrence of foreign stragglers and the movements of inhabitants.

SEIDENSACHER, E. Beobachtungen in der Vogelwelt gemacht in der Umgebung von Cilli in Steiermark im Jahre 1863. *Verh. Zool. Botan. Gesellsch. Wien*, 1864, pp. 85-92.

General observations carefully made, but no great novelty noticed.

SPERLING, R. M. Some Account of an Ornithologist's Cruise in the Mediterranean. *Ibis*, 1864, pp. 264-290.

Notes on 113 species are recorded. These have chiefly reference to the migration of birds, the whole paper containing important information on that subject. The fact that most birds cross the Mediterranean at night is especially noted.

STEVENSON, HENRY. A List of the Birds of Norfolk, with remarks on the General Ornithology of the County. Reprinted from White's History and Directory of the County. Sheffield: 1864. (Again reprinted, with alterations, '*Zoologist*,' pp. 9025-9036.)

Two hundred and ninety-three species are included. But Norfolk has always had the reputation of being one of the richest ornithological districts in the United Kingdom. The list is little more than a nominal one, abbreviations being appended showing the character in which the birds appear. In the '*Zoologist*' reprint, these abbreviations are expanded, and a few other alterations introduced (p. 9103).

SUNDEVALL, CARL J. Svenska Foglarna. Parts XIV. and XV. Stockholm: 1864. Oblong 4to:

These parts consist of Half-sheets 37 to 44 and Plates 53 to 60, both inclusive—the former extending, according to the author's arrangement (*cf.* K. Svensk. Vet.-Akad. Handl. 1843, pp. 378-384), from the end of the *Picidae* to the beginning of the *Accipitres*. This work is an exceedingly good example of what may

be done by a scientific man to adapt his subject to popular taste without making it less precise or wanting in dignity.

TRISTRAM, H. B. Report on the Birds of Palestine. Proc. Zool. Soc. 1864, pp. 426-456.

Three hundred and twenty-two species are enumerated in this most important paper. They are said to be strictly those which came under the personal observation, or are in the collections, of members of the author's exploring party. Of the 322 Palestine species, 230 are land-birds, and 92 water-birds; 96 of the whole are common to China and Palestine, and 260 common to Europe and Palestine; 31 are non-European species common to East Africa, and are chiefly desert-species of Nubia and the Sahara, while 27 are peculiar to Palestine and the districts adjacent,—the whole summary showing that Palestine must be included in the western part of the Palearctic Region. Nine previously undescribed species were met with by Mr. Tristram.

[WHEELWRIGHT, H. W.] A Spring and Summer in Lapland. By an Old Bushman. London: 1864, 12mo.

This is a reprint of a series of articles which appeared in the 'Field' Newspaper for 1863. The author passed the spring and summer of that year in Luleå Lappmark, having his headquarters at Quickjock; and much interesting information concerning the birds of that district is given by him. Mr. Wheelwright is well known to be an observer of great experience and long-proved accuracy.

WRIGHT, C. A. List of Birds observed in the Islands of Malta and Gozo. Ibis, 1864, pp. 42-73, 137-157. Additions to the above, *op. cit.* pp. 291, 292.

Two hundred and fifty-three species are enumerated as having, with a few exceptions, been observed by the author during the last ten or twelve years—thirty more than were noticed in Schembri's Catalogue published in 1843, while four others, erroneously included by as many writers, are omitted. Only ten or twelve species are resident, Malta being merely a resting-place for birds in their periodical passages across the Mediterranean. These generally arrive and leave at night, usually not remaining more than one day. Some species, however, stay a few months, while flocks, chiefly of *Grallæ* and *Anseres*, pass over high in air without alighting. In spring the Quails and most of the short-winged and smaller birds, though not unfrequently arriving in calm weather, generally appear during the prevalence of winds from N.N.W. to S.S.W., and in autumn with those from the S.S.E. to N.N.E., being probably

stopped in their course and driven to seek rest. Two unimportant additions to the number of Maltese species are mentioned by the author in his supplementary paper.

ÆTHIOPIAN REGION.

ADAMS, A. L. Notes and Observations on the Birds of Egypt and Nubia. Ibis, 1864, pp. 1-36, and (Extracts translated by Dr. HARTMANN from the first part only) in Journ. f. Ornith. 1864, pp. 382-393. Erratum noticed, Ibis, 1864, p. 430. See also ALLEN, S. S.

These observations were made on the Nile between Cairo and the Second Cataract, during November, 1862, and the two following months. Only about 105 species were noticed. The author remarks on the excellence of the representation of different birds in the hieroglyphic characters, and on the various species which were embalmed by the ancient Egyptians. In his introduction also he roughly indicates the geographical range of the species met with. The majority of *Grallæ* and *Anatidæ* do not proceed further south than the First Cataract; at the Second Cataract appear the outposts of a new ornithological province; but many common European birds appear to winter higher up the Nile. Dr. Adams also briefly shows the changes in the distribution of species observable when passing from the river to the desert.

ADAMS, A. L. Notes on the Mummied Bodies of the Ibis and other Birds found in Egypt. Edinb. New Philos. Journ., New Series, vol. xix. pp. 173-183.

The author remarks on the discrepancies in the dimensions of various mummied Ibises, which he thinks are not merely sexual differences, but owing to variation induced by long domestication, in which state he imagines the sacred bird to have been kept by the ancient Egyptians. A description of the contents of the gizzards of several specimens follows; and similar observations are made respecting the mummies of three species of *Falconidæ*.

ALLEN, S. S. Remarks on Dr. A. Leith Adams's "Notes and Observations on the Birds of Egypt and Nubia." Ibis, 1864, pp. 233-243.

The author has had more extended opportunities for observation than Dr. Adams, having spent four seasons in Egypt, not merely up the Nile Valley, but also in the Faioum and the Delta; in consequence he is able to extend the list of Egyptian birds not inconsiderably. With an enumeration of these additions,

and short remarks on some of the most interesting of them, the paper is occupied.

ANTINORI, ORAZIO. Catalogo descrittivo di una Collezione di Uccelli fatta nell' interno dell' Affrica centrale Nord. Milano: 1864, 8vo, 118 pp.

The author remained at Khartoum from May 1859 to July 1861, making excursions to explore the districts lying between the Blue and White Niles. Nine species of birds are described as new; but the Marquess does not seem to have been so fortunate as to have met with any of the novelties stated to have been discovered by Baron von Heuglin (*cf.* *Ibis*, 1864, pp. 400, 401).

GURNEY, J. H. A List of Birds collected in Damara Land by Mr. C. J. Andersson. *Proc. Zool. Soc.* 1864, pp. 1-8.

Fifty-two species are enumerated, in addition to those contained in the list published by Messrs. Strickland and Selater in the 'Contributions to Ornithology' for 1852; and notes on twenty-nine of those before known to belong to the avifauna of the country are appended.

GURNEY, J. H. An additional List of British Birds found in South Africa. *Zoologist*, pp. 9247, 9248.

The first list was published in the same magazine for 1863 (p. 8675). Seven additional species are now enumerated.

GURNEY, J. H. A Sixth additional List of Birds from Natal. *Ibis*, 1864, pp. 346-361.

This paper is in continuation of others published by the same author in the '*Ibis*' (1859, p. 234; 1860, p. 203; 1861, p. 128; 1862, pp. 25 and 149; 1863, p. 320), from the collections sent by Mr. Ayres. Thirty species are herein recorded as found for the first time in the colony, of which two, *Calamoherpe gracilirostris* and *Turdus gurneyi*, are described as new by Dr. Hartlaub. The latter is figured (pl. ix.). Notes on fourteen other species previously included in this series of articles are also added.

HARTMANN, R. Ornithologische Reiseskizzen aus Nord-Ost Africa. *Journ. f. Orn.* 1864, pp. 143-160, pp. 225-239.

A continuation of a series of articles in the preceding volume of the same periodical (*J. f. O.* 1863, pp. 229-240, 299-320, and 461-474), by the author, who landed at Cairo in November 1859, and in January proceeded up the Nile, returning thither in the following (as we suppose) October. The two concluding papers noticed above are chiefly devoted to observations on the ornithology of Sennaar, but no striking novelty seems to be recorded.

HEUGLIN, T. VON. Ornithologische Miscellen aus Central-Africa. Journ. f. Orn. 1864, pp. 241-276.

This long paper is full of a variety of information concerning the ornithology of the Djour country, lying, we believe, south of the Bahr-el-Gazal; and a good many species are described in it by the author as new, some absolutely, others provisionally, while particulars of several more supposed to have been previously discovered by him are also given. The majority of these perhaps will eventually prove to have been before made known by other explorers; for the author's long absence in Africa has hindered him from becoming aware of the labours of other naturalists, and his acquaintance with their works, as was some years ago remarked by Dr. Hartlaub (Bericht u. s. w. der Vögel, 1856, p. 38), is limited.

HEUGLIN, T. VON. Ueber Alcedinen und Meropiden Nordost-Afrika's. Journ. f. Orn. 1864, pp. 329-336.

Twelve species of the former and ten of the latter are enumerated, and notes respecting them subjoined. None of them are described as new.

KIRK, JOHN. On the Birds of the Zambesi Region of Eastern Tropical Africa. Ibis, 1864, pp. 307-339.

One hundred and fifty species are enumerated, and interesting notes on nearly all of them are appended, making this paper a most instructive one on the ornithology of the little-known region explored by the author.

SCLATER, P. L. On the Birds collected by Captain J. H. Speke during the East African Expedition. Proc. Zool. Soc. 1864, pp. 106-115.

About 70 specimens, representing 62 species, were brought home by Captain Speke; and the collection is of value as being from a country of which we have previously had no ornithological knowledge whatever, though it is hardly extensive enough to allow of deductions from it as to the general character of the avifauna of the region between Bogamogo opposite Zanzibar and Gondokoro on the Nile where it was formed. Five new species seem to have been discovered by Captain Speke, four of which have been already described by Dr. Hartlaub (P. Z. S. 1863, pp. 105, 106), viz. *Bradyornis spekii*, *Dryoscopus funebris*, *D. hamatus*, and *Vidua eques*. The fifth is now described by Dr. Sclater as *Psaldoprocne albiceps* (p. 108) and figured (pl. xiv.). The greater part of the species are such as have been already noticed as East-African, a few more Southern forms are intermixed. Captain Speke has added such notes as he was able concerning each. *Obs.* The so-called "*Cosmetornis spekii*" figured in Captain Speke's 'Discovery of the Sources of the Nile' 1864. [VOL. I.]

Nile,' p. 462, is stated by Dr. Sclater to be only the previously known *C. vexillarius*.

SCLATER, P. L. On the Birds of the Comoro Islands. *Ibis*, 1864, pp. 292-301.

The flora of the Comoros is, with only one exception, Madagascarian, and the fauna partakes of the same character. Nearly the whole of the birds are similarly identical with Madagascar species. The author's notes are compiled from the information of Drs. Kirk and Dickinson, and the birds collected by the last-named gentleman were submitted to Dr. Sclater's examination. Only 23 species are enumerated; among them is the rare *Accipiter francesi*, of which a figure (plate vii.) is given, and the new *Nectarinia (Cinnyris) comorensis* discovered by Dr. Peters (J. f. O., 1864, p. 161). The sacred bird (reputed to be wingless) of the lake Zalanga on Joanna proved to be a *Podiceps*, but the species was not ascertained.

SCLATER, P. L. On the Rapacious Birds collected by the late Dr. Dickinson in the Zambesi Region. *Ibis*, 1864, pp. 301-307.

This paper contains various notes on twenty-two species, and is illustrated by figures (plate viii.) of *Falco (Dissodectes) dickinsoni*, so named from its lamented discoverer, who was Surgeon to the Oxford and Cambridge Mission.

INDIAN REGION.

GOULD, JOHN. The Birds of Asia. Part xvi. London: 1864. Imp. folio.

This part of the 'Birds of Asia' contains figures and descriptions of sixteen species which were discovered by Mr. Swinhoe in the Island of Formosa, and described by Mr. Gould in the Proceedings of the Zoological Society (1862, pp. 280-286).

JERDON, T. C. The Birds of India; being a Natural History of all the Birds known to inhabit Continental India, &c. Vol. iii. (or Vol. ii. pt. ii.). Calcutta: 1864. Royal 8vo, pp. 441-876.

This third and concluding volume of Dr. Jerdon's laborious work contains an account of the species of *Columbæ*, *Gallinæ*, *Grallæ*, and *Anseres* which are found in India proper, amounting to 238 in number, and swelling the whole avifauna of the country to 1008 species. Throughout this long series the author has shown unremitting care in adducing all the information that can possibly throw light on his subject; and the result is that one of the most valuable works which has ever appeared is placed before the student of ornithology, who,

whether a beginner or an accomplished naturalist, cannot fail to find these volumes indispensable to him. The great defect of the 'Birds of India' is that its author has unfortunately given way to the practice of excessively multiplying genera, a practice which seems (if only as a mere matter of convenience) deserving of the strongest reprobation. It is due to Dr. Jerdon, however, to say that none of the genera adopted in this work are now invented by him.

PELZELN, A. VON. Einige Worte über eine von Herrn Robert Swinhoe eingesendete Sammlung von Vögeln aus China und Formosa. Verh. Zool.-Botan. Gesellsch. Wien, 1864, pp. 10, 11.

The author takes occasion to point out the great services which Mr. Swinhoe has rendered to Zoology.

SCHOMBURGK, ROBERT H. Cursory Notes on some of the Birds of Siam. Ibis, 1864, pp. 246-268.

A nominal list of the birds collected by the author was drawn up by Mr. Gould and published in the 'Proceedings of the Zoological Society' (1859, p. 151). These notes refer to forty species, a few of which were not included therein. Specimens of the subjects of them were sent to Dr. Selater, who has added the scientific name where Sir Robert has not himself inserted it. None of the species are new. The extraordinary abundance of Waders and Sea-birds met with on ascending the Menam river is especially noted.

SHORTT, JOHN. Account of a Heronry and Breeding-place of other Water-birds in Southern India. Proc. Linn. Soc. viii. p. 94.

The locality described is about fifty miles from Madras, and twelve from Chingleput. About eight species of the families *Ciconiidae*, *Tantalidae*, *Ardeidae* and *Pelecanidae* were found breeding there, some of them in very large numbers. Some of them were not very accurately identified by the author (*cf.* Ibis, 1865, p. 221).

SWINHOE, ROBERT. Amendments to the Catalogue of the Birds of China (P. Z. S. 1863, p. 259). Proc. Zool. Soc. 1864, pp. 271-272.

Eurinatorhynchus pygmaeus was inserted by mistake for *Limicola pygmaea* (i. e. *Tringa platyrhyncha*, Temm.); and *Larus niveus*, Pallas, is distinct from *L. canus* var. *major*, Middendorff, and is to be included, though doubtfully, in the list as a separate species, "from Kamtschatka and the Northern Seas."

SWINHOE, ROBERT. Descriptions of four new species of For-

mošan Birds; with further Notes on the Ornithology of the Island. *Ibis*, 1864, pp. 361-370.

The new species are *Kittacincla* (lege *Cittacincla*) *auricularis*, *Myiomela montium*, *Cyornis vivida*, and *Turdus albiceps*. The remainder of the paper is chiefly occupied by minute descriptions of *Platalea*.

SWINHOE, ROBERT. Letter concerning Indian Ornithology. *Ibis*, 1864, pp. 414-422.

Contains observations on several birds observed near Bombay, during the author's stay there on his return to China.

TICKELL, S. R. On the Hornbills of India and Burmah. *Ibis*, 1864, pp. 173-182.

AUSTRALIAN REGION.

BERNSTEIN, H. A. Voorloopige mededeelingen nopens Reizen in den Molukschen Archipel. *Nederlandsch Tijdschrift voor de Dierkunde*, 1864, pp. 329-375.

This paper contains an account of the author's travels from November 1860 to October 1863, in which are included very many zoological observations, chiefly on the birds of the Moluccas and the neighbouring islands.

BULLER, WALTER. Notice of the Remains of the Moa and other Birds formerly inhabiting New Zealand. *Zoologist*, pp. 9197-9200.

The author considers the extinction of all the species of *Dinornis* a settled question, but quotes some evidence to prove that large birds of the genera *Palapteryx*, "*Brachypteryx*"* (Owen, *nec* Horsfield)), and *Aptornis* still inhabit the unfrequented part of the interior. The evidence adduced is entirely second or even third hand, but it may be quite true for all that.

* The earliest mention of a genus *Brachypteryx* of the family *Rallidae*, that we have been able to find, is by Prof. Owen in *Proc. Zool. Soc.* 1848, p. 2. This name was previously (in 1816) applied by Horsfield to a genus of *Formicariidae*, and of course cannot be used in any other sense. We are indebted to Mr. G. R. Gray for the information, derived from Prof. Owen himself, that the description of the so-called "*Brachypteryx australis*" (evidently the bird referred to by Prof. Owen in the passage just mentioned, and also by Mr. Buller in the paper quoted in our text) appeared in the *Osteological Catalogue of the Museum of the Royal College of Surgeons* in 1853 (vol. i. p. 238, no. 1280). This "*Brachypteryx*" differs from *Ocydromus* in having 21 (instead of 22) vertebrae and 9 (instead of 10) pairs of ribs. "These differences are regarded by Prof. Owen as 'at most only specific.' Otherwise the description of *Brachypteryx australis* and the skeleton of *Ocydromus australis* agree."

HARTLAUB, G. Provisional List of a Collection of Birds lately made in the Feejee Islands. *Ibis*, 1864, p. 232.

Thirty-seven species are enumerated, of which some few are not identified.

ROSENBERG, G. VON. Beitrag zur Ornithologie von Neu-Guinea. *Journ. f. Ornith.* 1864, pp. 111 *bis* (*potius* 111)–138. (Translated by Dr. VON MARTENS from the "Natuurkundig Tijdschrift voor nederlandsch Indie, Jahrg. 1863.")

The author accompanied an expedition of the Dutch Government to explore the south-west and north-east coasts of New Guinea in 1858. The article contains a list of all the species of birds hitherto known to him to belong to that country, including the neighbouring islands of Jobie, Waigiu, Mysol, and Aru, all of which, excepting the first and last named, he has himself visited. The account of the birds inhabiting the south coast of New Guinea was furnished to him by Captain Dumoulin, that of those of the Aru Islands by Mr. Wallace. The Ké Islands and New Ireland are excluded, the first because they do not belong to the New Guinea group in a physical aspect, the second because the author had not sufficient *data* to go upon. Three hundred and two species are enumerated, of which the following are described as new discoveries of the author:—*Charmosyna pectoralis*, *Chalcopsitta leucopygialis*, *Lorius speciosus*, *Calao papuensis*, *Malurus sericyameus* and *Casuarinus kaupi*. Some of these under other names have probably been included in Mr. Wallace's or Mr. George Gray's writings (*cf.* 'Ibis,' 1863, p. 104), but the last was first made known by Herr von Rosenberg more than four years ago (*J. f. O.* 1861, p. 44. pl. i. figs. 12, 13).

SCLATER, P. L. List of a Collection of Birds from Huaheine, Society's Islands. *Proc. Zool. Soc.* 1864, pp. 8–11.

The collection was sent to Mr. J. H. Gurney by Mr. J. H. Wodehouse, and contains ten species, to the enumeration of which some notes are added by the collector.

WALLACE, A. R. On the Parrots of the Malayan Region, with Remarks on their Habits, Distribution and Affinities, and the Description of two New Species. *Proc. Zool. Soc.* 1864, pp. 272–295 (with a Map).

Parrots abound in all tropical countries, but, except in Australia and New Zealand, rarely extend into the temperate zone. The Indian and Æthiopian regions are poor in Parrots, while the Australian is the richest, containing many Genera and even whole Families peculiar to it. The author believes that in this region the Parrot-type originated, and endeavours to ascertain what portion of it was their birth-place. The region may be

divided into three sub-regions, (1) Australia, (2) the Pacific Islands, and (3) the Austro-Malayan Islands, which comprehend Celebes, the Moluccas, and New Guinea. This last sub-region is shown to be much the richest in Families, Genera, and Species, and Mr. Wallace therefore concludes that it consists of a portion of that country to which the *Psittaci* were once restricted.

The most highly organized group is the *Trichoglossidæ*, in which the whole structure is adapted to flower-feeding habits. These birds are spread over the entire Australian region, to which they are strictly confined, but they are especially abundant and varied in the Austro-Malayan islands, where four out of the six genera are exclusively found. Three of them form the group *Loriinæ*, in which the normal green ground-colour of the *Psittaci* is replaced by bright crimson. The Lories are found only in a very limited tract, which curiously enough is coincident with the range of the remarkable genus of true *Psittacidæ*, *Eclectus*, having a somewhat similar style of coloration. This tract comprises New Guinea, and the islands directly east and west of it from the Moluccas to the Solomon Islands, the products of all of which are so closely allied, as to suggest the idea that they are the fragments of a once continuous land. This small district is extremely rich in Parrots; no less than fifty-four species and fifteen genera inhabit it, and eight of the genera are peculiar to it. But yet New Guinea itself, undoubtedly the richest portion of this tract, is unexplored, so that we can only be supposed to know its *Ornis* in part. For these and some other reasons the author believes that New Guinea is the still existing portion of what was once the great tropical Pacific continent, and that "in the crimson Lories, the black *Microglossum*, the Birds of Paradise, and the great Crowned Pigeons, we have but a remnant and a sample of the strange and beautiful forms of life that once inhabited it, and many of which may still remain to be discovered in the untrodden Papuan forests."

The remaining four of the different families into which Mr. Wallace divides the *Psittaci*—*Ptyctolophidæ*, *Platycercidæ*, *Strigopidæ* and *Psittacidæ*—are next passed in review and their geographical distribution indicated. The curious connexion between Celebes and the Philippines, as shown by the strange genus *Prioniturus*, as well as by other birds and a few mammals and insects, is noticed, and the excessive poverty of the western part of the archipelago is pointed out as strongly confirming the division of the Australian and Indian regions before made by the author (Ibis, 1859, pp. 449-454).

Mr. Wallace considers the *Psittaci* as one of the primary divisions or orders in the class *Aves*, and cites in support of this view reasons drawn from their many and striking peculiarities of structure, habits, and distribution. This valuable paper is

concluded with a synonymic list (containing the descriptions of two new species), and a table showing their geographical distribution.

NEARCTIC REGION.

BAIRD, S. F. Review of American Birds in the Museum of the Smithsonian Institution. Part I. North and Middle America. Washington: 1864. Royal 8vo, pp. 1-176.

This work is a catalogue of the birds of Northern and Middle America, with such critical notices of them as appear to be called for, and a list of specimens selected to show the geographical distribution of the species. The words "North America" are used to mean all the region north of a line drawn from the mouth of the Rio Grande to that of the Yaqui, including Greenland. "Middle America" extends from the same line southward to the continental part of South America, including the Isthmus of Panama, and the whole of the West-Indian Islands except Trinidad, and perhaps Tobago.

It therefore follows from Prof. Baird's definition that this work treats of many species which properly belong to our next division.

LORD, J. K. List of Birds collected and presented by the British North American Boundary Commission to the Royal Artillery Institution. Proc. Roy. Artill. Instit. 1864, pp. 110-126.

This collection consists of eighty-seven species, and short notices respecting them are given by the author, who accompanied the Commission above-named as naturalist. The localities whence the specimens were procured are fully given, and the paper is of some value in determining the geographical distribution of birds in North-western North America.

"SAMUELS, E. A. A descriptive Catalogue of the Birds of Massachusetts. Boston: 1864." *

SCLATER, P. L. List of a Collection of Birds procured by Mr. G. H. White in the vicinity of the City of Mexico. Proc. Zool. Soc. 1864, pp. 172-179.

The first collection of birds from this locality that had come under the author's notice. It contains specimens of 156 species, amongst which are several additions to the Mexican avifauna, but none seem to be new to science.

* We have been unable to procure a copy of this publication, and only quote its title from the 'Journal für Ornithologie' (1864, p. 400).

NEOTROPICAL REGION.

CASSIN, JOHN. Notes on some species of Birds from South America. Proc. Acad. Philad. 1864, pp. 286-288, pls. 1-4.

This paper relates to two species of *Calliste* (one of them new), an *Orthonyx*, a *Pittasoma*, two species of *Monasa*, and a *Capito*.

LAWRENCE, G. N. Catalogue of Birds collected at the Island of Sombrero, W. I., with observations by A. A. JULIEN. Ann. Lyc. Nat. Hist. New York. viii, pp. 93-107.

Thirty-three species are enumerated, of which twelve only are land-birds. Two or perhaps three of these were undescribed: *Vireosylva atripennis* (Proc. Acad. Philad. 1863, p. 106), another *Vireosylva* allied to *V. altiloqua*, for which the name *virginalis* is suggested (if it proves to be distinct), and *Coccyzus julieni*. Prior to 1856 very large numbers of sea-birds used to breed on this little island, but since the occupation of it by the United States it is believed that not a single young one has been hatched. In 1863, only about two dozen eggs were found instead of the thousands of previous years.

MARCH, W. T. Notes on the Birds of Jamaica, with remarks by S. F. BAIRD. Proc. Acad. Philad. 1864, pp. 62-72.

This is one of a series of papers published by the authors in the same Journal (1863, pp. 151-154, and 283-305), and refers to the families termed *Ardeidae*, *Tantulidae*, *Charadriidae*, *Hemipodidae*, *Recurvirostridae*, *Scolopacidae*, *Rallidae*, *Colymbidae*, and *Anatidae*. About seventy-five species are here treated of. Many of the statements contained in this paper are of striking novelty, and it would be satisfactory to have some of them confirmed.

SALVIN, OSBERT. A Fortnight amongst the Sea-birds of British Honduras. Ibis, 1864, pp. 372-387.

An excellent account of the populous breeding-places of *Sterna* on the Belize Coast—*Anous stolidus*, *A. tenuirostris*, *Haliplana fuliginosa* and *H. panaya* being the chief.

SALVIN, OSBERT. Descriptions of Seventeen New Species of Birds from Costa Rica. Proc. Zool. Soc. 1864, pp. 579-586.

The author is acquainted with about 304 species from this country, no less than about sixty-five of which have been described by various authors as new, and these have not been found beyond the limits of Costa Rica, or the adjoining province of Veragua. *Carpodectes*, a new genus of *Cotingidae*, is defined, and a figure of the type species, *C. nitidus*, given. Two new species of Humming-birds of the genus *Oreopyra*—hitherto represented

by a single species and a unique specimen—are also described, and a fourth species, previously known as *Anthocephala castaneiventris*, is referred to the same genus.

SALVIN, OSBERT, and SCLATER, P. L. (See SCLATER, P. L., and SALVIN, OSBERT.)

SCLATER, P. L. On some Additions to the List of the Birds of the Falkland Islands. Proc. Zool. Soc. 1864, p. 73.

Two species, obtained by Capt. Packe, are added to the list previously drawn up by Dr. Sclater (P. Z. S. 1860, p. 382). These are *Egretta leuce* and *Prion turtur*. The author adds, from the 'Ibis' (1861, p. 312), rectifications of the names of two others, viz. *Nycticorax obscurus* for *N. gardeni*, and *Larus glaucotis* for *L. roseiventris*.

SCLATER, P. L., and SALVIN, OSBERT. Notes on a Collection of Birds from the Isthmus of Panama. Proc. Zool. Soc. 1864, pp. 342–373, pl. xxx.

Two hundred and seventy-two species are included in this list, to which is prefixed a concise notice of previous papers treating of the same subject. The collection was formed by Mr. M'Leannan, and observations are added by Mr. Salvin, who, in March and April 1863, spent some weeks at Panama and on the line of railway thence to Colon. Three hundred and eighty-nine species are at present known to inhabit this section of the isthmus, which seems, ornithologically speaking, more nearly allied to the lowlands of the northern portion of New Granada and Western Ecuador than to the country immediately to the north of it. Four new species are described, namely, *Cassidix microrhynchus*, *Myrmeciza immaculata*, *Camptostoma flaviventris*, and *Conurus ocularis*, while of all those enumerated a very full synonymy is given, correcting a great many former errors. One species, *Eucometis cassini*, is figured. This very important paper is so replete with information, that, though well deserving minute analysis, it is hardly possible within our limited space to do justice to its multitudinous details.

SCLATER, P. L. Descriptions of Seven New Species of Birds discovered by the late Dr. John Natterer in Brazil. Proc. Zool. Soc. 1864, pp. 605–611, pls. xxxvii.–xxxix.

The results of Natterer's discoveries in Brazil have hitherto been only partially known. By permission of the authorities of the Vienna Museum, Dr. Sclater has been able to acquire some of the duplicate specimens collected by that naturalist, and among them were the new species described in this paper. Herr von Pelzeln also supplied the author with extracts from Natterer's MS. journal, which add to the value of the examples to which they refer.

TAYLOR, E. C. Five Months in the West Indies. *Ibis*, 1864, pp. 73-17, 157-173.

The first of these two articles is devoted to Trinidad and Venezuela, where the author stayed about three months, in the beginning of the year 1863, during which time he made two excursions on the mainland of South America, one up the Orinoco to Angostura, the other along the coast to La Guayra and thence to Caracas. About 141 species are enumerated as noticed in these localities; one of them is described (by Dr. Sclater) as new, under the name of *Tyrannus rostratus*. The second article contains an account of the birds observed in Martinique, Dominica, and Porto Rico, at each of which islands the author passed a fortnight. The *Trochilidæ* of the two former are identical; but it is much to be regretted that he has not kept the lists of the three islands, so far apart as they are situated, separate. Each of them has a distinct species of *Certhiola*; that from Dominica is described as *C. dominicana*. The *Phonipara* of Porto Rico is identified with *P. omissa*—that of the more windward islands. This is a singular case of distribution, as the Jamaican species has hitherto been taken as identical with that of the Virgin group (*cf.* *Ibis*, 1864, p. 405). A new species of *Pitangus* from Porto Rico is characterized (by Dr. Sclater) as *P. taylori*.

DESCRIPTIVE ANATOMY.

BOULTON, W. W. Sternum of Little Crane shot in Cambridge-shire. *Zoologist*, pp. 9285-9289.

The sternal apparatus of *Crex minuta* is described, and compared with that of *C. pratensis* and *Gallinula chloropus*.

CRISP, E. On the Visceral Anatomy of the Screamer (*Chauna chavaria*)*. *Proc. Zool. Soc.* 1864, pp. 14-16.

Two examples, which had died in the Society's Gardens, were examined. Dr. Crisp sums up his observations as follows:—

"The important peculiarities of this bird are the great lightness of the skeleton, the presence of air under the skin, the great length of the rectum, and the extent of the mucous folds, the large calibre of the appendices, and the very slight connexion between the hepatic lobes." The author does not state if he has arrived at any conclusion respecting the systematic place of this bird.

FATIO, VICTOR. Note sur une particularité de l'appareil reproducteur mâle chez l'*Accentor alpinus*. *Rev. et Mag. de Zool.* 1864, pp. 65-67.

* i. e. *Chauna nigricollis*, Sclater, *P. Z. S.* 1864, p. 74.

The author states that in the male of this species, at the approach of the breeding-season, when the genital organs become exceedingly enlarged, the *vasa deferentia* are contorted into two clusters, which hang down at either side of the *anus* in two pouches formed by the skin of the bird, and supported by the *os pubis*. In the autumn this seasonal exaggeration entirely disappears.

OWEN, R. On the Skeleton of *Alca impennis*. Proc. Zool. Soc. 1864, p. 258.

Professor Owen's observations were founded on a specimen sent from Funk Island to Mr. A. Newton, by the Bishop of Newfoundland (P. Z. S. 1863, p. 435); and the memoir will be published in the 'Zoological Transactions.'

PARKER, W. K. On the Osteology of Gallinaceous Birds and Tinamous. Trans. Zool. Soc. vol. v. part 3. pp. 149-241. pls. xxxiv.-xlii.

The object of this paper is to throw light on the affinities of the *Gallinæ*, both among themselves and in relation to the surrounding groups. The chief difficulty lies with the *Pteroclidæ*, *Hemipodius*, and the *Tinamidæ*. First of all the author dismisses the *Columbæ*, which must be made to stand by themselves, and then the *Tinamidæ*, in which exist "no very nascent Plover qualities." Of those that are left he considers that in the *Megapodidæ* "the Rasorial qualifications reach their highest point," and that this might be called the ultratypical group. The *Tetraonidæ* differ from the *Phasianidæ* just as Ducks differ from Geese. *Crax* is a true and normal link between the *Phasianidæ* and *Palamedeidæ*. *Talegalla* and the other *Megapodidæ* are not only related to *Crax* and *Palamedea*, but also to *Ocydromus* and *Rhinochetus*. The *Turnicidæ* and *Pteroclidæ* he regards as inosculant groups, the first connecting the true *Gallinæ* by means of *Coturnix* with *Tinamus*, *Ægialites*, and *Chamapelia* (the author does not appear to have compared *Turnix* with *Crax*), the second passing from the *Tetraonidæ* to the *Charadriidæ* and *Columbæ*. *Tinamus*, according to Mr. Parker's views, is essentially Struthious, though in its structure closely related to *Dendrotyx*; and in arriving at this result he seems chiefly influenced by the character of the *os quadratum*, which, he says, "is thoroughly Reptilian in the Tinamou as in the Ostriches."

PARKER, W. K. On the Osteology of the Kagu (*Rhinochetus jubatus*). Proc. Zool. Soc. 1864, pp. 70-72.

To Mr. Parker *Rhinochetus* seems to connect *Eurypyga* and *Psophia*, but whether it be most of a *Grus*, a *Nycticorax*, or an *Ocydromus*, he will not say; it also has a more distant relation-

ship with *Ædicnemus*. The sternum of *Rhinochetus* is truest to the embryo *Grus*, its furculum is but little stronger "than that of the *Brachypteryx*" (quære *Ocydromus*?).

The present paper is but an abstract (nearly all details being omitted) of one which will appear in the 'Zoological Transactions.'

PARKER, W. K. On the Sternal Apparatus of Birds and other Vertebrata. Proc. Zool. Soc. 1864, pp. 339-341.

The author's remarks are in defence of the terminology used by Geoffroy St.-Hilaire, and in opposition to that of Prof. Owen. The term "clavicle" is stated to have been "loosely and incorrectly applied to a part of the thoracic apparatus which is well developed in Frogs and Lizards, but continues rudimentary in Birds."

PTERYLOGRAPHY.

HOLLAND, TH. Pterologische Untersuchungen. Journ. f. Orn. 1864, pp. 194-217.

The author commences by defining the terms he employs, which differ slightly from those made use of by Nitzsch, and proceeds to describe the structure of the quill and accessory plume in the different kinds of feathers. He then treats of the asserted existence of true hair upon birds, which he maintains to be a mistake. The barbs are either flat or rounded, the latter always the case in down. They are also sometimes twisted. The development of the feather, which varies in different birds, is next considered, and the author investigates its formation from the sheath, comparing the views entertained on this point by various authors. He then proceeds to inquire into the mode in which the colouring matter is secreted, concluding that the sheath deposits the pigmentary corpuscles in the same sequence and colours as they are afterwards distributed on the mature feather. He afterwards examines the much controverted question as to the supposed change of colour in a matured feather, and declares that an old feather cannot grow any more, and especially no change of matter can take place in it. Finally Dr. Holland expresses his opinion as to the only conditions under which a bird's plumage can be altered, in terms identical with those enunciated by Herr Eugen von Homeyer (J. f. O. 1864, pp. 108-111).

HOMeyer, EUGEN F. von. Beitrag zur Mauser einiger Wasservögel. Journ. f. Orn. 1864, pp. 108 bis-111 bis (*potius* pp. 108-111).

Alca torda and *Anas clangula* are the species noticed in this communication, which is in continuation of a series of articles by

the same author in the same journal (J. f. O. 1855, pp. 113-117; 1856, pp. 129-132 *inter alia*). Herr von Homeyer quotes, and agrees to, the following results—at which, from a consideration of principles formerly announced by him, Herr T. Holland has also arrived :—

“A bird can only change its plumage,

“1. By the growth of new feathers in place of the old shed ones.

“2. By the growing-forth of entirely new feathers.

“3. By the loss of certain parts of the feather in a mechanical manner.

“4. By the chemical influence of light and the atmosphere on the pigment of the feathers (and possibly by the operation also of external colouring agents).

“5. By the union of two or more of these processes.”

NEOSSOLOGY.*

BLASIUS, J. H. Zur Unterscheidung des Dunenkleides der Raubvögel. Journ. f. Orn., 1864, pp. 276-289.

The author treats in considerable detail of the differences observable in the young of the *Accipitres*, when clad in down, grouping them for this purpose conveniently (but, of course, arbitrarily) according to characters drawn from the legs and feet—whether covered entirely or in part with feathers, with scales, or with reticulated skin. He remarks on the very different colouring which the young of *Buteo vulgaris* present, even from the earliest age. There are (1) those with pure white down. These grow up into the pale examples with white undersurfaces, whose feathers never have a cross marking, and their under tail-coverts and bellies only a single shaft-streak, their breasts being thinly and their backs thickly spotted. (2) Those with uniform ashy-grey down, having constantly a pure white spot on the hind-head. From these originate the dark specimens which in mature plumage always have cross bars on the feathers of the underside, especially on the flanks and thighs. (3) Those with light whitish-grey bodies and pale, almost white, heads, with a white longitudinal streak on the hind-head. These vary much in the intensity of their colouring, and when mature show a corresponding inconstancy, fluctuating between the two extremes. The paper contains remarks on most of the European species of *Falconide* and several of the *Strigide*.

* The attention of many ornithologists having been of late more than ever turned to the study of birds at their very earliest age, we have thought it might be convenient for such persons to place together the notices of those publications which treat of this branch of study. This being the case, we trust the necessity of inventing a new term will be admitted.

ELLIOT, DANIEL GIRAUD. A Monograph of the *Tetraoninae*, &c. New York: 1864.

Part I. of this work contains figures of the newly hatched young of *Pediæcetes columbianus*, and Part II. those of *Canace canadensis* and *Lagopus scoticus*.

GOULD, JOHN. The Birds of Great Britain. London: 1864.

Part V. includes representations of the very young state of *Syrnium aluco*, *Recurvirostra avocetta*, *Otis tarda*, *Loxia curvirostra*, and *Charadrius pluvialis*. In Part VI. are included those of *Botaurus stellaris*, *Lagopus mutus*, and *Porzana maruetta*.

MARCHAND, A. Poussins des oiseaux d'Europe couverts de duvet à la sortie de l'œuf. Rev. et Mag. de Zool. 1864.

In continuation of the series of illustrations announced in the same journal for the preceding year (pp. 97-99), and containing figures of the newly-hatched young of *Recurvirostra avocetta*, *Phalaropus hyperboreus*, *Tetrao lagopus*, *Alca torda*, *Hamatopus ostralegus*, *Anas penelope*, *Buteo vulgaris*, and *Fuligula ferina*; the following are represented in a volume for 1864:

Podiceps minor,	pl. 1.	Charadrius pluvialis,	pl. 7.	Strix noctua,	pl. 24.
Scolopax gallinago,	" 2.	Falco subbuteo,	" 8.	Astur palumbarius,	" 25.
Anas acuta,	" 3.	Neophron percno-		Fuligula glacialis,	" 26.
Gallinula porzana,	" 4.	pterus,	" 23.		

No letter-press accompanies these illustrations.

MEVES, W. Poussins décrits. Rev. et Mag. de Zool. 1864, pp. 98-117. Translated from *Oefvers. K. Vetensk. Acad. Förhändl.* 1860, p. 187, by M. ALPHONSE GAILLARD.

Descriptions are given of the chicks of twenty-five species, belonging to the orders *Accipitres*, *Gallinae*, *Grallae*, and *Anseres*. They were among the results of Herr Meves's journey to Jemtland some years since. The following is a list of the species described, the author's names being retained:—

Astur nissus.	Lagopus alpinus.	Anas boschas.
Buteo vulgaris.	Charadrius apricarius.	" penelope.
" lagopus.	Numenius phaeopus.	Fuligula fusca.
Circus cyaneus.	Totanus hypoleucus.	" nigra.
Strix aluco.	Scolopax rusticola.	" clangula.
Tetrao bonasia.	Larus canus.	Mergus serrator.
" urogallus.	" fuscus.	Colymbus arcticus.
" tetrix.	Anser segetum.	" septentrionalis.
Lagopus subalpinus.		

OOLOGY.

ALTUM, B. Die Eier von *Buteo vulgaris*. Journ. f. Orn. 1864, pp. 23-32.

This paper is in continuation of two others which appeared in

the same periodical for the preceding year (pp. 339 and 435), in which the author treated of the colouring, size, and relative form, maintaining that the views of Prof. Blasius (Bericht der XIII. Versammlung der D. O. G. p. 46), as to the impossibility of distinguishing between eggs of *Buteo vulgaris*, *Milvus iclinus* and *M. ater*, were erroneous. The subject of the present article is the grain of the shell. Dr. Altum, from the examination of a large series, defines fourteen different kinds of granulation observable in the eggs of *B. vulgaris*; that which he considers most usual, and calls "Bussardkorn," is when "the otherwise smooth shell appears undulating," and in accordance with these definitions he minutely describes the specimens composing sixty layings. He concludes by stating, also at some length, the results at which he has arrived.

ALTUM, B. Die spirale Anlage in der Zeichnung vieler Vogeleier. Journ. f. Orn. 1864, pp. 103-105 (*potius*, pp. 87-89).

The author says the spiral disposition of marking is found only in eggs of the Buzzard, most of the waders, and many of the swimming-birds. The twist is always to the right hand. A left-handed spiral is unknown to him, and such an exception would be as great a rarity as a similar deviation from the normal type in a snail-shell.

BEAVAN, R. C. Specimens of Birds' Eggs collected in the neighbourhood of Barrackpore. Proc. Zool. Soc. 1864, pp. 375-377.

Twenty-four species are enumerated, and a description of the eggs is included in Dr. Jerdon's 'Birds of India.'

BLACKMORE, H. P. Remains of Birds' Eggs found at Fiskerton near Salisbury. Edinb. New Philos. Journ. 1864, vol. xix. N. S. pp. 74, 75.

Fragments of two eggs were found in brick-earth, one about 14 feet, the other about 20 feet below the surface, which had never been disturbed. They are supposed by the author to belong to *Anser ferus* and *Anas boschas*; with the first egg were bones corresponding with those of the species to which the eggs are assigned.

COCHRANE, J. H. Note on the Nesting of the Lanner Falcon (*Falco lanarius*, Schlegel). Ibis, 1864, pp. 183, 184. Errata noticed *op. cit.* pp. 429, 430.

Two eggs are figured (plate iv.), one that of *F. lanarius*; the other, as subsequently stated, is supposed to be that of *F. barbarus*, though the reasons for the correction are not given.

DOBREE, A. On the Nest and Eggs of the Coach-whip-bird and of the White-fronted Ephthianure, with some general

Remarks on the Nidification of Australian Birds. Zoolo-
gist, pp. 9175-9178.

The author describes the nests and eggs of the two species above mentioned, namely, *Psophodes crepitans* and *Ephthianura albifrons*; those of the latter agree with the account given of them by Mr. E. P. Ramsay (Ibis, 1863, pp. 178, 179). Mr. Dobree remarks also on the well-known singularity in the mode of nidification adopted by some of the birds of Australia, and concludes by assigning as a reason for the scarcity of birds in that country the fact that many of them lay so small a number of eggs.

FISCHER, J. C. H. Ægget af Nöddekrigen (*Caryocatactes guttatus*). Krøyer's Naturhist. Tidsskrift, 1864.

Having ascertained that the Nutcracker bred in the island of Bornholm, both in 1862 and 1863, the author was disappointed in his efforts to procure the long-wished-for egg of this species, as in each year the birds had hatched their brood before the nest was found. In the spring of 1864 the haunts of a pair of Nutcrackers were closely watched, and their nest, with four eggs, was discovered on the 23rd March. A description of these and of the nest is appended. (Cf. P. Z. S. 1862, pp. 206-208; Ibis, 1862, pp. 365-368.)

GOULD, JOHN. Description of the egg of *Parra gallinacea*. Proc. Zool. Soc. 1864, p. 661.

It appears closely to resemble the well-known eggs of others of the *Parridæ*.

KRÜPER, TH. Beitrag zur Naturgeschichte des Eleonoren-Falken, *Fulco eleonora*, Géné. Journ. f. Orn. 1864, pp. 1-23.

The eggs are described as resembling rather those of *F. subbuteo* than of *F. peregrinus*. The author discovered many nests, and his paper gives very full details of the breeding-habits of the species.

NEWTON, ALFRED. Ootheca Wolleyana: an illustrated Catalogue of the Collection of Birds' Eggs formed by the late John Wolley, Jun., M.A., F.Z.S. Edited from the original Notes. Part I. *Accipitres*. London: 1864. Royal 8vo, pp. 180.

The plates in this portion of the work represent six eggs of *Neophron percnopterus*, twelve of *Aquila chrysaëtus*, twelve of *Archibuteo lagopus*, six of *Pandion haliaëtus*, six of *Falco gyrfalco*, four of *Nyctale tengmalmi*, four of *Surnia uhula*, and four of *Syrnium lapponicum*, besides nests of *Pandion haliaëtus* (two plates), *Astur palumbarius*, *Aquila chrysaëtus* (two plates), *Grus cinerea*, and *Cygnus ferus*. The mode of breeding of most of

these birds is described at considerable length, and chiefly from Wolley's observations.

NEWTON, ALFRED. On the Breeding of the Green Sandpiper, *Helodromas ochropus*. Ann. & Mag. Nat. Hist. 3 ser. xiv. pp. 221-224; Zoologist, pp. 9115-9118. (From P. Z. S. 1863, pp. 529-532.)

Without adducing any novel facts, the author brings together a number of observations, which nearly all agree in showing that this species departs from the habits of its congeners and usually occupies the old nests of other birds, either *Passeres* or *Columbæ*, thus hatching its eggs at a considerable height from the ground.

RAMSAY, E. P. Notes on Birds breeding in the neighbourhood of Sydney. Ibis, 1864, pp. 243-245.

The mode of nidification and the eggs of *Ptilotis auricomis* are described.

SEIDENSACHER, E. Ueber das Ei des kurzbeinigen Sperbers, *Astur brevipes* s. *dussumieri*, *Falco badius*. Verh. Zool.-Botan. Gesellsch. Wien, 1864, pp. 14, 15, pl. i.

Two eggs of this species taken at Smyrna, by Dr. Krüper, from a nest of four, were sent to the author, from whose description and figure it would appear that they pretty well resemble those of other species of the genus *Accipiter*:

Casuarius kauyi from New Guinea. The eggs are stated to resemble those of *C. galeatus* from Cram, but to be somewhat smoother in the shell. Some details of its mode of nidification are also given.—G. VON ROSENBERG, J. f. O. 1864, p. 134.

ACCIPITRES.

GURNEY, JOHN HENRY. A Descriptive Catalogue of the Rap-torial Birds in the Norfolk and Norwich Museum. Part I. *Serpentariidæ*, *Polyboridæ*, *Vulturidæ*. London, 1864. Royal 8vo, pp. 90.

This catalogue differs from most works of its kind in giving, (besides the ordinary information respecting the various specimens contained in the collection, their synonymy, localities, and donors) such particulars respecting the geographical distribution, food, nidification, and habits of each species as the author has been able to ascertain, thus making the work a very useful history of the groups included in it. Thirty species of the three families treated of are represented in the Norwich Museum by 141 mounted skins and 16 skeletons.

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FALCONIDÆ.

HOGG, JOHN. On the Roman Imperial and Crested Eagles. Ann. & Mag. N. H. 3 ser. xiii. pp. 520-523.

The author strives to identify the *uncrested* Eagle of classical mythology with the *Aquila heliaca* of Savigny, and the *crested* Eagle of the Syrian sculptors with either the *Aquila desmursi* of South Africa or *Spizaetus coronatus* of India!

Aquila barthelemyi. Two living specimens of this doubtful species were procured from the historical nest at Sainte Victoire in 1857. One of them in April 1864, never having previously shown any departure in plumage from the ordinary *A. chrysaetus*, was observed to have the first scapular feather on each side of the body snow-white—the characteristic according to M. Jaubert of his supposed species. An immature male bird from Southern Algeria, in the Norwich Museum, also presents this same peculiarity, and the title of this singular form to be considered specifically distinct merits further observation. J. H. Gurney, Ibis, 1864, pp. 339, 340.

Spizaetus ayresi is the immature form of *S. spilogaster*, to which species *S. zonurus* and *S. leucostigma* should also be referred. P. L. Sclater, Ibis, 1864, pp. 303, 304; J. H. Gurney, l. c. p. 356.

Archibuteo lagopus in adult plumage is figured. J. Gould, B. Grt. Br. part vi.

Buteo vulgaris. The different colouring presented by the young birds of this species is described, and its connexion with the varied plumage of the adults considered, by J. H. Blasius, J. f. O. 1864, pp. 276-289. (See above, under the heading 'Neossology'.)

Falco gyrfalco is represented in A. Newton's 'Ootheca Wolleyana,' pl. C.

Falco eleonoræ. A contribution to the Natural History of this bird is given by Th. Krüper, Journ. f. Orn. 1864, pp. 1-23. The author passed a considerable time in the summer of 1862 on the Cyclades, especially Paros, Naxia, and Mykoni, in investigating the very peculiar economy of this species. It preys upon *Lanius rufus*, and, he was told, also on *Gallinago media*. The adult female varies much. He found four distinct types of colouring in six specimens. The author remarks on the synonymy of the species; it is identical with *F. arcadicus* and *F. concolor* of Lindermayer (nec *F. concolor*, Temm.) and *F. dichrous* of Erhard; and proceeds to describe its mode of breeding. It makes no nest, but lays its eggs on cliffs generally in the month of August. In the beginning of October it departs for the winter, but the time of its return the author has not yet precisely ascertained. He does not seem to have seen it, however, before the beginning of April.

Falco dickinsoni is a new species, discovered by the late Dr. Dickinson on the banks of the Shire, in East Africa. It is allied to *F. ardesiacus* and *F. zoniventris*; and for the distinct section which these three species form, the author proposes *Dissodectes* as a subgeneric name. P. L. Sclater, P. Z. S. 1864, p. 248, and Ibis, 1864, p. 305, pl. viii.; also J. Kirk, Ibis, 1864, p. 316.

Tinnunculus ruficeps, a subspecies, from Egypt and Nubia, of *T. alaudarius*, is treated of. L. Brehm, Nov. Act. Acad. Nat. Cur., 1 June, 1864, pp. 4-8.

Erythropus vespertinus found south of the equator. J. H. Gurney (*vide* C. J. Andersson), P. Z. S. 1864, p. 2, and J. Kirk, Ibis, 1864, p. 316.

Avicida cuculoides, from Natal (Ibis, 1859, p. 240), should be *A. verreauxi*. J. H. Gurney, Ibis, 1864, pp. 356, 357.

Astur griseiceps, from Celebes, is noticed and figured. A. R. Wallace, Ibis, 1864, p. 184, pl. v.

Astur macrurus, description of an apparently real male bird of this rare species, and of the type specimen, now considered as the female. H. Schlegel, Nederl. Tijdschr. Dierk. 1864, pp. 155-157.

Accipiter francesi, from the Comoros, is noticed and figured. P. L. Sclater, Ibis, 1864, p. 298, pl. vii.

Accipiter nisus is figured. J. Gould, B. Grt. Br. part v.

Accipiter badius has been found breeding at Smyrna by Dr. Krüper. E. Seidensacher, Verh. Zool.-Bot. Gesellsch. Wien, 1864, p. 15.

Micronisus gabar, believed formerly to have been observed in Palestine (Ibis, 1859, p. 26), was probably mistaken for something else. H. B. Tristram, P. Z. S. 1864, p. 429.

Circus æruginosus, *C. cyaneus*, and *C. cineraceus*. Observations on the changes in their plumage. J. P. van Wickevoort Crommelin, Nederl. Tijdschr. Dierk. 1864, pp. 3-6.

STRIGIDÆ.

Bubo caligatus has been again procured in Formosa (Ibis, 1863, p. 218). The species may yet prove to be *Syrnium indranee*, and is now referred to that genus. R. Swinhoe, Ibis, 1864, pp. 428, 429.

Syrnium aluco (in rufous plumage) with young is figured. J. Gould, B. Grt. Br. part v.

Ketupa ceylonensis has been found to inhabit Palestine. H. B. Tristram, P. Z. S. 1864, p. 430.

PSITTACI.

SCHLEGEL, H. Muséum d'Histoire Naturelle des Pays-Bas. 5^{me} Livraison. *Psittaci*. Leyde: 1864. Royal 8vo, pp. 166.

The genera into which the author divides the *Psittaci* are *Arara*, *Conurus*, *Psittaculus*, *Psittacus*, *Eclectus*, *Amazona*, *Psittacula*, *Palaornis*, *Platycercus*, *Euphema*, *Strigopsis*, *Trichoglossus*, *Nanodes*, *Lorius*, *Loriculus*, *Cacatua*, *Microglossum*, *Calyptrorhynchus*, and *Nestor*. According to the synopsis at the end of the catalogue, we find that the Leyden Museum contains 1204 examples (including osteological specimens) of 259 species of birds of this order. Lesson's term *Amazona* is used for a comprehensive group of tropical American Parrots, including the older genera *Chrysotis* (in part), *Pionus* and others, which vary in size between *Corvus frugilegus* and *Turdus merula*, with a rather rounded tail, tolerably short, rarely very short, or a little elongated. For the precise boundaries of Professor Schlegel's other groups we must refer our readers to the work itself, as well as for the details of his unification of many of the species

usually considered distinct. No new ones appear to be described.

WALLACE, A. R. On the Parrots of the Malayan Region, &c. Proc. Zool. Soc. 1864, pp. 272-295.

This paper has been already fully noticed among the publications relating to the 'Australian Region,' to which from its contents it seemed properly to belong, but as it is one of very great importance, we again refer to it here that it may not escape the attention of our readers.

BERNSTEIN, H. A. Beschouwingen en Opmerkingen over H. von Rosenberg's Overzicht der Papegaaisoorten, in den Indischen Archipel. Nederl. Tydschr. Dierk. 1864, pp. 325-328. Reprinted from Nat. Tijdschr. Ned. Ind. part xxvii.

The author of course had not seen Mr. Wallace's remarkable paper on the same subject, just cited. Herr von Rosenberg's Review appeared in the 'Journal für Ornithologie' (1862, pp. 59-68).

PLYCTOLOPHIDÆ.

"*Cacatua ducorpsi*, Sclater" (P. Z. S. 1862, p. 141, pl. xiv.), is not *C. ducorpsi*, Hombron et Jacquinot. It is now proposed to be called *C. ophthalmica*. It is larger, with the crest entirely lemon-coloured, and has a blue naked skin surrounding the eye. The author adds a diagnostic list of the thirteen known species of *Cacatua*, and a figure of the true *C. ducorpsi* is given (pl. xvii.)—the new species, *C. ophthalmica*, having been wrongly figured under that name, as quoted above. P. L. Sclater, P. Z. S. 1864, pp. 187-189.

Cacatua cristatella is a new species from Northern Gilolo, similar to *C. cristata*, but, as shown by the dimensions given, much smaller, and with a red instead of an olive iris. A. R. Wallace, P. Z. S. 1864, pp. 279-280.

PLATYCERCIDÆ.

Pyrrhulopsis splendens. A living specimen had been obtained from the Feejee Islands, but died on the voyage to England. Dr. Sclater adds an enumeration of the other species of the group. P. Z. S. 1864, p. 158.

Platycercus personatus is not the young of *P. splendens*, but a very distinct species. G. Hartlaub, Ibis, 1864, p. 232.

STRIGOPIDÆ.

Strigops habroptilus. Careful and interesting observations on the habits of this very curious form are recorded. Julius Haast, Ibis, 1864, pp. 340-346. (Translated from the Verh. Zool.-Bot. Gesellsch. Wien, 10 Oct. 1863.)

PSITTACIDÆ.

Phæocephalus fuscicapillus, the most common Parrot in East Tropical Africa; *P. levaillanti*, a much rarer species on the Zambesi than the last-named. J. Kirk, Ibis, 1864, p. 329.

Polyteles alexandræ, sp. n., obtained on Mr. J. M. Stuart's expedition across Australia, much resembles *P. barrabandi*, but has a blue crown, and the lower parts of the cheeks rose-pink instead of yellow. J. Gould, Ann. & Mag. N. H. 3 ser. xiii. pp. 248, 249. (From P. Z. S. 1863, p. 232.)

Cyclopsitta blythi is a new species from Mysol, similar to *C. desmaresti* from New Guinea, but wanting the blue cheek-spot. From the intermediate station of Salawatty, there is a specimen in the British Museum possessing this character in a slight degree. A. R. Wallace, P. Z. S. 1864, p. 284.

Melopsittacus undulatus, its breeding at large in the Tyrol. Althammer, Rev. Zool. 1864, pp. 366, 367.

Ara macao (?), its longevity in confinement (64 or 65 years). H. Aucapitaine, Rev. Zool. 1864, pp. 409-411.

Myiops catharina identical with *Psittacula lineola*. P. L. Selater, P. Z. S. 1864, pp. 177, 178.

Conurus rhodogaster is a new species, first brought to Europe from Brazil by Natterer. It is allied to *C. lepidus*, but differs from that and others of the group by its scarlet belly. P. L. Selater, P. Z. S. 1864, p. 298, pl. xxiv.

Conurus ocularis is described as a new species from the isthmus of Panama. It has been confounded by Mr. Lawrence with both *C. pertinax* and *C. chrysogenys*, from which it can be distinguished by its entirely green crown and small subocular spot. P. L. Selater and O. Salvin, P. Z. S. 1864, pp. 367, 368.

Brotoperys chrysosema is a new species, first brought to Europe from Brazil by Natterer. It is allied to *B. notatus*, but is of a brighter and yellower green colour, and has yellow instead of orange wing-coverts, a larger gular spot, and a bluer crown of the head. P. L. Selater, P. Z. S. 1864, p. 298.

Chrysotis finschi is a new species, in the British Museum, where it was recognized by Mr. Finsch as distinct from *C. viridigenalis* (from Panama), to which it is nearly allied. But it is larger than that species and has the feathers of the under parts more distinctly bordered with black. P. L. Selater, P. Z. S. 1864, p. 298.

Chrysotis viridigenalis (from Panama) may ultimately be found to belong to a distinct species, and perhaps entitled to the MS. name *glauciceps* of Hartlaub, given in Mr. Gray's 'List of *Psittacidae*' (p. 82). P. L. Selater and O. Salvin, P. Z. S. 1864, p. 368.

TRICHOGLOSSIDÆ.

Lorius speciosus, from the islands in Geelvink Bay, New Guinea, is described as a new species. Said to be very like *L. cyanauchen*, but somewhat larger, and wanting the red band which in that species divides the blue nape from the black crown. The blue also forms two 'horns' running down the sides of the neck, while in *L. cyanauchen* the throat is entirely blue from shoulder to shoulder. There is, besides, in *L. speciosus* a red band, and below it a blue one across the lower part of the upper-neck, of which there is no trace in the other species. G. von Rosenberg, J. f. O. 1864, p. 114.

Chalcopsitta leucopygialis, from Dorey, New Guinea, is described as a new species. G. von Rosenberg, J. f. O. 1864, p. 113.

Charmosyna pectoralis, from Dorey, New Guinea, is described as a new species. G. von Rosenberg, J. f. O. 1864, p. 112.

PICARIÆ.

On the respective Affinities and Classification of the Non-passerine *Insectivores*. E. Blyth, Ibis, 1864, pp. 411, 412.

PICIDÆ.

Celeus fraseri appears undistinguishable from *C. mentalis*. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 367.

Gecinys tancola and *Picus insularis* are figured. J. Gould, B. As. part xvi.

TROGONIDÆ.

Trogon concinnus of Mr. Lawrence (Ann. Lyc. N. York, vii. p. 463), the type of which is evidently taken from a young bird, is attributed to *T. caligatus*. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 364.

BUCCONIDÆ.

Megalæma nuchalis is figured. J. Gould, B. As. part xvi.

Bucco leucoerissus, from Ecuador, is hardly separable from *B. dysoni*, from Guatemala. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 363.

Malacoptila panamensis and *M. inornata* may probably be sexual forms of the same bird. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 363.

MOMOTIDÆ.

All the so-called species allied to *Momotus lessoni*, especially *M. psalurus*, *M. microstephanus*, and *M. subrufescens*, require a careful examination, which will probably lead to the union of several obscure forms which are barely recognizable. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 362.

Momotus martii is referred to *M. semirufus*. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 363.

ALCEDINIDÆ.

Alcedo ispida is figured. J. Gould, B. Grt. Br. part vi.

CAPITONIDÆ.

The error of uniting the *Capitonidæ* with the *Bucconidæ* is again combated by E. Blyth, Ibis, 1864, p. 411.

Tetragonops frantzii is a new species from Costa Rica, smaller and quite differently coloured from *T. rhamphastinus*. P. L. Sclater, Ibis, 1864, pp. 371, 372, pl. x.

Monasa flavirostris of Strickland (Contr. Orn. 1850, p. 47) had been already described from the same specimen by Lafresnaye (R. Z. 1860, p. 216) as *M. azullaris*. J. Cassin, Proc. Acad. Philad. 1864, p. 288.

Capito versicolor (Muller). A specimen of this species, which is little known to modern ornithologists, but identical with *Bucco pictus* of Boddaert, *B. elegans* of Gmelin, and *B. maynanensis* of Brisson, and figured by Buffon, Pl. Enl. 330, is in the Museum at Philadelphia. J. Cassin, Proc. Acad. Philad. 1864, p. 288.

BUCEROTIDÆ.

Buceros hastatus, and several others of the genus are remarked upon by T. von Heuglin, J. f. O. 1864, pp. 268-271.

Buceros cavatus, *B. albirostris*, *B. pusuran*, and *B. nipalensis*, with *Toccos tickelli*, of which last a figure (pl. iii.) is given, form the subject of a paper by Lieut.-Col. S. R. Tickell. Ibis, 1864, pp. 173-182.

Buceros cristatus, its habits described. J. Kirk, Ibis, 1864, p. 326.

Calao papuensis, from New Guinea generally, and its islands to Waigiou and Aru, is described as a new species, certainly distinct from *C. ruficollis* of the Moluccas, with which it has hitherto been confounded. The New Guinea species always has the head and neck equally yellowish-brown, whereas in the Moluccan bird the yellow passes more into white. The hind-head and neck are, however, dark chestnut-brown. G. von Rosenberg, J. f. O. 1864, p. 117.

MUSOPHAGIDÆ.

Turacus livingstonii, sp. n., approaching *T. albocristatus* in general appearance, but differing in the front feathers of the crest being larger and ending in a prolonged point, brought by Mr. C. Livingstone from the Manganja Highlands of East Africa. G. R. Gray, P. Z. S. 1864, p. 44; Ann. & Mag. N. H. ser. 3. vol. xiv. p. 240; J. Kirk, Ibis, 1864, pp. 328, 329.

CUCULIDÆ.

SCHLEGEL, H. Muséum d'Histoire Naturelle des Pays-Bas. 5^{me} Livraison. CUCULI. Leyde: 1864. Royal 8vo. pp. 85.

The author classes among the *Cuculi* the genera *Indicator*, *Cuculus* (including as subgenera *Cuculus* proper, *Eudynamis*, *Cacomantis*, *Chrysococcyx*, and *Prodotiscus*), *Scythrops*, *Leptosomus*, *Coccyzus*, *Geococcyx*, *Coccytes*, *Cua*, *Crotophaga*, *Phenicophaës*, *Piaya*, *Neomorphus*, *Centropus*, *Musophaga*, *Colius*, and *Opisthocomus*. Of these he enumerates 122 species as being represented by 842 specimens in the Museum at Leyden. Each species, together with its varieties or local races, which by many naturalists would be deemed good species, is described, and the origin of the different specimens serving to illustrate it in the Museum is, so far as known, carefully given. It would be impossible for us, with the space at our command, to go through the various groups in detail; this however is to be regretted the less, as the work is one which is indispensable to all students of Ornithology. No species are described as new.

Chrysococcyx schomburgki, sp. n., nearly allied to *C. hodgsoni* and *C. xanthorhynchus*, sent from Siam by Sir R. Schomburgk. J. Gould, P. Z. S. 1864, p. 73.

Cuculus libanoticus is described as a new species from Palestine, allied to *C. micropterus* and *C. gularis*, but still more to *C. canorus*, if indeed it be not merely an hepatic variety of the last. H. B. Tristram, P. Z. S. 1864, p. 432.

Cuculus canorus (adult and immature) is figured. J. Gould, B. Grt. Br. part v.

Melignothus pachyrhynchus, "if new," is described from the Djour-country. Very like *Indicator minor*, perhaps identical with *I. conirostris* (Cassin). T. von Heuglin, J. f. O. 1864, pp. 265, 266.

SLATER, P. L. Notes on the Species of Cuckoos of the Genus *Neomorphus*. P. Z. S. 1864, pp. 249, 250.

The author gives diagnoses of the two species known to him, *N. geoffroyi* from South-eastern Brazil, and *N. rufipennis*, from Guiana and the Upper Amazons. The latter he has little doubt is identical with *Cultrides pucherani*, Deville.

Coccyzus bairdi is a new species, similar to, but smaller than, *C. americanus*, and having its wings the same colour as its back, sent from Jamaica by Mr. J. M. Philipps.

The author adds a conspectus of the eight species of the genus known to him, and gives diagnoses of them. He states that there is probably also a ninth, *C. cinereus*, Vieill., of which he does not possess a specimen. The species newly characterized is *C. dominicus*, Baird (nec Brisson, nec Slater). There appears to be a printer's error in the length assigned to the wing. P. L. Slater, P. Z. S. 1864, pp. 119-122.

Coccyzus julieni is described as a new species from Sombrero, West Indies, differing from the other yellow-billed species of those islands in being without any rufous colouring below or on the quills. G. N. Lawrence, Ann. Lyc. New York, viii. pp. 42, 43, and 99.

CAPRIMULGIDÆ.

Steatornis caripensis. A breeding locality of this bird in Trinidad is described by E. C. Taylor, Ibis, 1864, pp. 88-90.

Macrodipteryx condylopterus is described as a new species from the Djour-country, resembling *Caprimulgus poliocephalus* in colouring; but the author considers it may form a distinct generic or subgeneric section. T. von Heuglin, J. f. O. 1864, pp. 243, 244.

Cosmetornis spekii, figured in Captain Speke's 'Journey to the Sources of the Nile' (p. 462), is stated by Dr. Slater (P. Z. S. 1864, p. 111) not to differ from the rare but previously known *C. vaxillarius*. This species was met with by Captain Speke in Uganda (Ibis, 1864, p. 115), and the only example brought home by him is figured (*loc. cit.* pl. ii.). It is stated by Dr. Kirk (Ibis, 1864, p. 323) to be decidedly common a little above Tete on the Zambesi, as well as on the west side of Lake Nyassa. It would appear from the examination of several specimens that the amount of white on the primaries in this species is variable; hence too much dependence should not be placed on that character as distinctive of the West African *C. burtoni*, described by Mr. G. R. Gray in 1862 (Ann. & Mag. Nat. Hist. ser. 3. vol. x. p. 445).

Caprimulgus tamaricis, a new species from the Dead Sea, where it was discovered by the author. In form and size intermediate between *C. asiaticus* and *C. albonotatus*, but in coloration very distinct. H. B. Tristram, P. Z. S. 1864, pp. 170 and 430.

CYPSELIDÆ.

Cypselus dubius is described as a new species from Central Africa, strongly

resembling *C. apus*, but having all the feathers barely tipped with whitish and the tail more forked. O. Antinori, Cat. Ucc. Affr. centr. p. 25.

TROCHILIDÆ.

Oreopyra hemileuca and *O. calolema* are two new species from Costa Rica. It is just possible that the latter may be the male of *Anthocephala castaneiventris*; but if so, that specific name is totally inapplicable; and anyhow that bird should be referred to the genus *Oreopyra*. The supposed female of the *Panterpe insignis* of Cabanis (Mus. Hein. iii. p. 43, note), described by Mr. Lawrence (Ann. Lyc. New York, viii. pp. 45, 46), is supposed to be identical with *O. castaneiventris*. O. Salvin, P. Z. S. 1864, pp. 584, 585. .

Chalybura melanorrhoa and *Selasphorus flammula* are also two new species from Costa Rica; the former is allied to *C. isauræ*, but with a black vent; the latter to *S. platycercus*, but is smaller and has differently coloured rectrices. O. Salvin, P. Z. S. 1864, pp. 585, 586.

Urochroa leucura is described as a new species from Ecuador, closely resembling, and possibly identical with, *U. bougueri*, but differing materially in the colour of the tail. G. N. Lawrence, Ann. Lyc. N. York, viii. pp. 43, 44.

Urosticte ruferissa is a new species from Ecuador, differing from *U. benjamini* in being larger, in wanting the violet mark beneath the gorget and the white spot behind the eye, in having the crissum rufous instead of green, and in other particulars. G. N. Lawrence, Ann. Lyc. New York, viii. pp. 44, 45.

Ramphomicon (lege *Ramphomicrus*) *olivaceus* is a new species from Bolivia, exceeding in size any species of that genus, the feet and claws being twice the size of what they are in *R. heteropogon*, which is the only one it at all resembles, and being of a uniform olive colour. G. N. Lawrence, Ann. Lyc. New York, viii. p. 45.

PASSERES.

PITTIDÆ.

WALLACE, A. R. Remarks on the Habits, Distribution, and Affinities of the genus *Pitta*. Ibis, 1864, pp. 100-114.

The author describes at some length the habits of the species observed by him; he considers that in the majority of them the sexes are alike in plumage. He adds the colours of the soft parts of all the species collected by himself, and then proceeds to enumerate the 33 species known to him, which, for convenience' sake, he groups in 10 sections, and, summing them up, finds that Africa and Asia possess 6 species of three groups, Australia 2 species of two groups, whereas the Malay Islands have 25 species of eight groups, proving that the genus is eminently Malayan, and one of the very few that characterize the archipelago as a whole, and not one extremity only of it; though there appears to be a determination both of groups and species towards the Indo-Malayan province. Two species of the same group scarcely ever inhabit the same island, illustrating the theory of the extermination of closely allied forms by the dominant race. Some further deductions from this case of geographical distribution are added, and the author concludes by considering the affinities of the genus, which, with the Old-World subfami-

lies *Myiophoninae*, *Cinclinae*, and *Tinaliinae*, and the *Thamnophilinae*, *Formicivorinae*, and *Formicariinae* of the New World, forms, he thinks, "a large and very natural family of short-winged terrestrial or semi-terrestrial insectivorous birds."

Pitta oreas, sp. n., from Formosa, allied to *P. cyanoptera* and to *P. nympha*. From the former it may be distinguished by its reddish crown and light under parts; from the latter by the colour of its crown and the want of the black chin. R. Swinhoe, Ibis, 1864, p. 428.

FORMICARIIDÆ.

Myrmeciza læmosticta, sp. n., from Costa Rica. O. Salvin, P. Z. S. 1864, p. 582.

Grallaria dives is a new species from Costa Rica, allied to *G. fulviventris* and *G. macularia*, but differing from the former by the rufous margins of its remiges, from the latter by the want of a bare space round the eye, and from both by its straighter hind claw. O. Salvin, P. Z. S. 1864, p. 582.

Hypocnemis flacescens is an undescribed species, discovered by Natterer in Brazil, resembling *H. cantator*, but easily distinguished by its yellow breast. P. L. Sclater, P. Z. S. 1864, p. 609.

Pittasoma michleri is mentioned and figured. J. Cassin, Proc. Acad. Philad. 1864, p. 287, pl. 3.

Thamnophilus doliatius and *T. amazonicus* of Lawrence (from Panama) are referred to *T. affinis* and *T. nævius* respectively. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 355.

Myrmotherula gularis, from Esmeraldas (P. Z. S. 1860, p. 294), belongs strictly to *M. fluviventris* of Lawrence, the latter being easily distinguished by the fulvous belly. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 356.

Formicivora quizensis of Lawrence (from Panama) is referred to *F. boucardi*, *F. consobrina* (from Ecuador) being slightly different. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 356.

Gymnocichla nudiceps. The female described. It is closely allied to *Pyri-glæna*. The *Pithys rufigularis* (♀) and *Myrmeciza ferruginea* of Mr. Lawrence (from Panama) are referred to this species. P. L. Sclater and O. Salvin, P. Z. S. 1864, pp. 356, 357.

Myrmeciza immaculata is a new species from Panama, differing from the *M. exul* of Sclater, with which it was confounded by Mr. Lawrence, by not having its wing-coverts spotted with white, and being larger. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 357.

PTEROPTOCHIDÆ.

Pteroptochus thoracicus is an undescribed species, discovered by Natterer in Brazil, allied to *P. albicollis*, but smaller in bulk, with a shorter bill (which has a straight culmen and an ascending gony) and a pectoral spot. The form is subgenerically (if not generically) distinct, and may stand as a separate section, for which the name *Liosceles* is proposed. P. L. Sclater, P. Z. S. 1864, pp. 609, 610 (woodcuts), plate xxxviii.

DENDROCOLAPTIDÆ.

Thripophaga guttuligera, a new species received from Bogota by MM. Ver-

reaux, allied to *T. striolata*, but less stout and with the head of a duller colour. It might be arranged either as a *Thripophaga* or as a *Heliobletus*, and serves to connect these two forms. P. L. Sclater, P. Z. S. 1864, p. 167.

Sclerurus caudacutus of Lawrence (Ann. Lyc. N. York, vii. p. 320) is supposed to be identical with *Tinactor guatemalensis* of Hartlaub (Rev. Zool. 1844, p. 370). It differs from the true *S. caudacutus* (Vieill.), as well as from *S. mexicanus*, by wanting the rufous rump those species possess; and in this respect it resembles *S. brunneus*. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 354.

Dendrocinclæ olivacea, and perhaps *D. fumigata* of Lawrence (from Panama), we referred to *D. atrirostris*, which, however, should be removed to the genus *Dendromanens*, the true *Dendrocinclæ* having the bill broader and flatter. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 355.

MELIPHAGIDÆ.

Zosterops erythropleura, a new species from Northern China, confounded by Von Schrenck with *Z. chloronotus*, but distinguishable by its deep chestnut-red sides. The author also remarks on the other species of the genus inhabiting China or Japan. R. Swinhoe, Ann. & Mag. N. H. 3 ser. xiii. p. 177. (From P. Z. S. 1863, p. 203.)

Zosterops pallescens, "if new," is described from the Djour-country, with the crown of the head yellow. T. von Heuglin, J. f. O. 1864, pp. 259, 260.

Zosterops fusca is described as a new species from Waigiou. H. A. Bernstein, Nederl. Tijdschr. Dierk. 1864, p. 323.

NECTARINIIDÆ.

Cinnyris comorensis is a new species from the island of Joanna, discovered and described by W. Peters, J. f. O. 1864, p. 161. (Cf. Ibis, 1864, p. 299.)

Anthreptes lepida, Remarks on. R. H. Schomburgk, Ibis, 1864, pp. 248, 249.

Nectarinia gonzenbachi is described as a new species from Central Africa, strongly resembling *N. jardinii*, but with violet steel-coloured upper tail-coverts, and the middle rectrices elongated. O. Antinori, Cat. Ucc. Afr. centr. p. 35.

Arachnothera vagans is a new species from Waigiou, where it is much less common than *A. novæ-guinææ*. H. A. Bernstein, Ned. Tijdschr. Dierk. 1864, pp. 322, 323.

CÆREBIDÆ.

CASSIN, J. Notes of an Examination of the Birds of the Subfamily *Cærebinae*. Proc. Acad. Philad. 1864, pp. 265-275.

The author considers that the *Certhia cyanea* of Linnæus may be presumed to be the type of the genus *Cæreba*, of which he particularizes 8 species. To the genus *Chlorophanes* he refers one species, distinguishing 4 varieties, two of them (*C. spiza* var. *cærulescens*, and *C. spiza* var. "d." *melanops*) for the first time. Under the genus *Dacnis* he enumerates 12 species (grouping them in the subgenera *Cyanodacnis*, *Polidacnis* [qu. *Poliodacnis*?], *Eudacnis*, *Atelodacnis*, and *Hemidacnis*). In *Certhiola* Mr. Cassin includes seven species, and mentions a specimen in the Smithsonian Museum, which probably belongs to

another and undescribed one. Of *Conirostrum* he particularizes 4 species, of which one is doubtful; to *Diglossa* he refers 13 species, arranging them in the subgenera *Diglossa*, *Tephrodiglossa*, *Pyrrhodiglossa*, *Cyanodiglossa*, and *Melanodiglossa*, while under *Diglossopsis* he mentions one single species. The whole of this valuable paper is worked out with that elaborate skill which characterizes so many, if not all, of Mr. Cassin's contributions to Ornithology.

Dacnis ultramarina is a new species from the Isthmus of Panama, closely resembling *D. cerebicolor* and *D. cayana*, but lighter than the first and darker than the last, and differing from both in the black of the lore not extending behind the eye, and the dull colour of the spot on the throat. It is the *D. cerebicolor* of Lawrence (*nec* Sclater), Ann. Lyc. N. Y. vii. p. 291. G. N. Lawrence, Proc. Acad. Philad. 1864, p. 106.

Certhiola luteola is the continental species of this genus, smaller than the others, and not having the prominent pink lips. E. C. Taylor, Ibis, 1864, p. 81. The true *C. flaveola* occurs in Porto Rico. In Dominica there is another species, described as new under the name of *C. dominicana*; it differs from the last in having the yellow rump much less clearly defined, the throat much darker in colour, the yellow under parts much brighter and deeper in tint, and also wants the white outer edge of the primaries. *C. albicula* from Martinique is not quite so large as the Dominican bird, is paler and duller yellow beneath, and the patch on the rump hardly perceptible. It also wants the white on the primaries; but the most striking specific character is a broad white stripe down the middle of the throat. Id. loc. cit. pp. 166, 167.

COTINGIDÆ.

Piprites griseiceps is a new species from Costa Rica, allied to *P. chlorion*, but wanting the yellow forehead, and with an ash-coloured head. O. Salvin, P. Z. S. 1864, p. 583.

Pipra nattereri is an undescribed species, discovered by Natterer in Brazil. It comes near *P. isidorii* and *P. serena*, but is easily known by its green body-colour and pure white cap and rump. P. L. Sclater, P. Z. S. 1864, p. 611, pl. xxxix.

Lipangus rufescens. The locality "Coban," hitherto assigned for this species, and for all the specimens said to have been collected by M. Delattre in Guatemala, is probably a mistake. P. L. Sclater and O. Salvin, P. Z. S. 1864, pp. 364, 365.

Carpodectes is a new genus, akin to *Ampelio* from South America, but having a stronger and higher bill and longer wings. The type is *C. nitidus*, a new species from Costa Rica. O. Salvin, P. Z. S. 1864, pp. 583, 584, pl. xxxvi.

AMPELIDÆ.

Myiadestes melanops is a new species from Costa Rica, allied to *M. unicolor*, but with a black forehead and chin and an orange bill. O. Salvin, P. Z. S. 1864, pp. 580, 581, pl. xxxv.

TIMALIIDÆ.

Pomatorhinus erythrocnemis is figured. J. Gould, B. As. part xvi.

Garrulax ruficeps and *G. pæcilorhyncha* are figured. J. Gould, B. As. part xvi.

Alcippe brunnea is figured. J. Gould, B. As. part xvi.

HIRUNDINIDÆ.

Psalidoprocne albiceps is a third and, apparently, new species of this little African group, brought by Capt. Speke from Uzinza. The author adds the synonymy of the two previously known species, *P. holomelæna* and *P. pristoptera*, from which the present is easily known by its white head and throat. P. L. Sclater, P. Z. S. 1864, p. 108, pl. xiv.

Hirundo monteirii (qu. *H. senegalensis*, sexus alterius? vide J. H. Gurney, Ibis, 1863, p. 317) observed on the River Shiré, Zambesia, alighting on the clay banks and entering holes. J. Kirk, Ibis, 1864, pp. 319, 320.

Hirundo tytleri is described as a new species from Bengal, glossy black above, beneath dark ferruginous chestnut. Form and size of *H. rustica*. T. C. Jerdon, B. India, iii. p. 870.

Hirundo rupestris, observed several times in large flocks near Lisbon. C. F. Mathews, Naturalist, 1864, p. 90.

EDOLIIDÆ.

Graucalus frenatus is described as a new species from the Djour-country. Very like *G. pectoralis*, but with forehead and eyelashes silvery-white, and lores markedly black. T. von Heuglin, J. f. O. 1864, p. 255.

VIREONIDÆ.

Vireosylva olivacea. Under the name of *Muscicapa olivacea*, a specimen of this bird is recorded as having occurred near Derby in May 1859. Edwin Brown, Zool. pp. 8965-8967. (From 'The Natural History of Tutbury. By Sir Oswald Mosley. With the Fauna and Flora of Burton-upon-Trent. By Edwin Brown. London: 1863,' pp. 385-388.) The author unfortunately quotes the remarks of Mr. Gosse on *Vireosylva altiloqua* of Jamaica, as applicable to the present species.

TYRANNIDÆ.

Myiobius capitalis is a new species from Costa Rica. O. Salvin, P. Z. S. 1864, p. 583.

Pyrocephalus obscurus perhaps an abnormal form of *P. mexicanus*. P. L. Sclater, P. Z. S. 1864, p. 176.

Camptostoma flaviventre is a new species from Panama, referred to *C. imberbe* by Mr. Lawrence, but apparently distinct from it, and to be recognized by its clear yellow belly and more distinct brownish cap. It has also been collected in Ecuador by Mr. Fraser. P. L. Sclater and O. Salvin, P. Z. S. 1864, pp. 358, 359.

Tyrannus magnirostris of Dr. Sclater's 'Catalogue' (No. 1449, p. 236) appears to him now not to be *T. magnirostris* of D'Orbigny. It is therefore described under the name *T. rostratus*. P. L. Sclater, Ibis, 1864, p. 87, note.

Pitangus taylori is a new species, found by Mr. E. C. Taylor in Porto Rico, akin to *P. caudifasciatus*, but wanting the band on the tail, and fuscous instead of blackish-grey above. P. L. Sclater, Ibis, 1864, p. 169, note.

LANIIDÆ.

Lanius mexicanus from Mexico is *L. excubitoroides*. P. L. Sclater, P. Z. S. 1864, p. 173.

Lanius pallidus is described as a new species from Central Africa, intermediate in size between *L. minor* and *L. excubitor*, and with the coloration peculiar to birds of the desert. O. Antinori, Cat. Ucc. Afr. centr. pp. 56, 57.

Prionops tricolor. Described as a new species allied to *P. retzii*, obtained during the Zambesi Expedition. G. R. Gray, P. Z. S. 1864, p. 45; Ann. & Mag. N. H. ser. 3. xiv. p. 379. Mr. Gray appends to his notice an enumeration of the six species of the genus now known, as well as the three of the genus *Sigmodus*, which he now considers allied to *Prionops*. Dr. Sclater (Ibis, 1864, p. 319, note) says that *P. tricolor* appears to him to be not different from *P. retzii*.

MUSCICAPIDÆ.

Smithornis rufolateralis, a new species of smaller size, and of more variegated plumage than the single species (*S. capensis*) previously known. Brought from West Africa, but the exact locality unknown. G. R. Gray, P. Z. S. 1864, p. 143; Ann. & Mag. N. H. ser. 3. xiv. p. 457.

Leucocerca lessoni is by no means a *Leucocerca*, but a very distinct form, to be separated generically. G. Hartlaub; Ibis, 1864, p. 232.

Cyornis rivida, sp. n., from *Formosa*, allied to *C. rubeculoides*. R. Swinhoe, Ibis, 1864, p. 363.

Butalis grisola and *Muscicapa atricapilla* are figured. J. Gould, B. Grt. Br. part v.

Muscicapa aquatica is described from the Djour-country. T. von Heuglin, J. f. O. 1864, pp. 256, 257.

Muscicapa muscipeta, a subspecies of *M. atricapilla*, is treated of. L. Brehm, Nov. Act. Acad. Nat. Cur., 1 June, 1864, pp. 9-13.

Erythrostera parva has a second time occurred in England. E. H. Rodd, Ibis, 1864, pp. 130, 131. Its subspecies *rufigularis* is treated of. L. Brehm, Nov. Act. Acad. Nat. Cur., 1 June 1864, pp. 14-17.

Elminia tercsita is a new species from Central Africa, strongly resembling *E. longicaudata*, but with a rather larger bill, hind-head somewhat crested, and black lores. O. Antinori, Cat. Ucc. Afr. centr. p. 50.

MNIOTILTIDÆ.

The genera of this family and its allies are very minutely differentiated by Professor Baird, and the variations of structure in their tongues microscopically examined by Dr. W. Stimpson, the descriptions being illustrated by a series of woodcuts. Rev. Am. Birds, pp. 160-167.

Perissoglossa is a new genus established for the *Dendraca tigrina* (*Sylvia maritima*, Wilson), the characters being chiefly based on its lingual structure, which is so fundamentally different as compared with that of other members of the family as almost to warrant its entire removal from *Mniotiltidæ*. S. F. Baird, Rev. Am. Birds, p. 162.

Parula inornata is described as a new species from Guatemala, differing from *P. pitiayumi* (v. *brasiliensis*), with which it has hitherto been confounded, by wanting the white bands on the wings and the ochreous throat. S. F. Baird, Rev. Am. Birds, pp. 169, 171.

Basileuterus cinereicollis is a new species received from Bogota by MM. Verreaux, resembling *B. coronatus*, but differing in the colour of its crest and throat. P. L. Sclater, P. Z. S. 1864, p. 166.

Granatellus pelzelni is an undescribed species discovered by Natterer in Brazil (thus extending the range of the genus into South America), distinguishable from *G. venustus* by the want of the narrow black breast-band and the outer rectrices not being tipped with white, and from *G. sallæi* by its white throat. P. L. Sclater, P. Z. S. 1864, p. 606, pl. xxxvii. fig. 1.

Diagnoses of the three species of this genus are added (*op. cit.* p. 607), and a figure of *G. venustus* is given (*tab. cit.* fig. 2), copied from that of M. du Bus in his unpublished 'Esquisses Ornithologiques' (pl. 34).

TURDIDÆ.

Turdus pilaris. A very full account of three colonies which had been formerly described by Herr. O. von Boenigk (Naumannia, I. iv. pp. 29-37) is given by Alexander von Homeyer, J. f. O. pp. 289-296.

Turdus pilaris and *T. iliacus* are figured. J. Gould, B. Grt. Br. part vi.

Turdus gurneyi, sp. n., from Natal. G. Hartlaub, Ibis, 1864, p. 350, pl. ix.

Turdus albiceps is a new species from Formosa, nearly allied to *T. castaneus*. On the carpal edge of the wing is a rather conspicuous tubercle or wart; "it is of course an abortive wing-spur, which in *Turdus dactylopterus*, Bp., of Syria appears to have acquired a full development." R. Swinhoe, Ibis, 1864, pp. 363, 364.

Turdus confinis is described as a new species from Cape San Lucas, with a general resemblance to an immature *T. migratorius*, especially its western variety, but has rather different proportions, is much paler beneath, with a greater extent of white on the belly and no black or dusky on the head. S. F. Baird, Rev. Am. Birds, pp. 29-31.

Mimocichla schistacea is described as a new species from Cuba, with stouter bill and legs, and no cinnamon-red on the body. S. F. Baird, Rev. Am. Birds, pp. 37, 38.

Platycichla is a new genus, with the general appearance of a *Planesticus*, but differing markedly in having a short and very broad deeply cleft bill, much depressed at the base and with moderate bristles. The feet are weak, the tarsi very short, being less than the middle toe and claw, and without transverse divisions. In external form the genus exhibits an approach to the *Ampelidæ*, especially to *Myiadestes*.

P. brevipes (sp. nov.) is the type of the genus. A specimen from the coast of South America, probably from Brazil, is in the Smithsonian Museum. Two others are in that of the Philadelphia Academy. It may possibly be the *Cichlopsis leucogenys* of Cabanis (Mus. Hein. i. p. 54, note), but it cannot be reconciled with the description of that genus and species. S. F. Baird, Rev. Am. Birds, pp. 32, 33.

Kittacincla (lege *Cittacincla*) *auricularis* is a new species from Formosa, with

a bill proportionately stronger than in *C. macrura*. R. Swinhoe, Ibis, 1864, pp. 361, 362.

Melanoptila glabrirostris found on several of the outer Cays on the Belize coast. O. Salvin, Ibis, 1864, p. 380.

Catharus gracirostris is a new species from Costa Rica, resembling *C. frantzii*, but easily recognized by its ash-coloured throat and crown. O. Salvin, P. Z. S. 1864, p. 580.

Hypsipetes niveiceps is a new species from Swatow in China; it differs from the Formosan *H. nigerrimus* in having a white head and a smaller bill, though the bird is larger, and also in several other particulars. R. Swinhoe, Ibis, 1864, p. 424.

Hypsipetes nigerrima is figured. J. Gould, B. As. part xvi.

Myiophoneus insularis is figured. J. Gould, B. As. part xvi.

Pericrocotus griseogularis is figured. J. Gould, B. As. part xvi.

SYLVIIDÆ.

PETERS, W. Eine neue Singvögel-Gattung *Cichladusa*. Monatsber. K. Akad. Wissensch. Berlin, 16 March, 1863. J. f. O. 1864, pp. 252, 253.

This new genus agrees with *Bessonornis* in the form of its wing- and tail-feathers, as well as in its booted tarsi, but differs from that form not only by having a stronger bill, and stiff comb-shaped feathers on the forehead, but also by having round instead of cuneiform nostrils.

Cichladusa arquata, sp. nov., from Sena, near the Zambezi, is described as the type, and the author states that *Crateropus guttatus* of Heuglin belongs to the same genus.

Myiomela montium is a new species from Formosa allied to *M. leucura*, but wanting the blue eye-streak, and having a differently marked tail. R. Swinhoe, Ibis, 1864, pp. 362, 363.

Saxicola albigularis from Palestine is referred to the genus *Bessonornis*. H. B. Tristram, P. Z. S. 1864, p. 441.

Pratincola rubetra and *P. rubicola* are figured. J. Gould, B. Grt. Br. part vi.

Ruticilla phœnceurus and *R. tithys* are figured. J. Gould, B. Grt. Br. part vi.

Acrocephalus stentorius has been met with near Damietta by S. S. Allen. Ibis, 1864, pp. 97, 98, plate i.

Acrocephalus arundinaceus, on the nidification of. E. O. Herklotz, Sitzungsber. Ak. Wien, 1864, pp. 56, 57.

Calamoherpe gracilirostris is a new species from Natal. G. Hartlaub, Ibis, 1864, p. 348. Additional particulars respecting it are added. T. Ayres, loc. cit.

Curruca rubricapilla, a subspecies of *C. atricapilla*, is treated of. L. Brehm, Nov. Act. Acad. Nat. Cur., 1 June 1864, pp. 18-23.

Phyllopneuste rufa, apparently wintering in Cornwall. Stephen Clogg, Zool. pp. 2022, 2023.

Hippolais (lege *Hypolais*) *upcheri* is described as a new species from northern Palestine. Its nest and note are very different from those of its congeners. H. B. Tristram, P. Z. S. 1864, p. 438.

Polioptila nigriceps is a new species from Mazatlan, resembling *P. melanura*

in general appearance, but readily distinguished by the white outer tail-feather and much purer white of the under parts. It differs also in other respects from the remaining species of this genus. S. F. Baird, Rev. Am. Birds, p. 69.

Drymæca valida and *D. iodoptera* are described as new species from the Djour-country. T. von Heuglin, J. f. O. 1864, pp. 258, 259.

Drymæca (?) *trogodytes* is described as a new species from Central Africa. O. Antinori, Cat. Ucc. Affr. centr. p. 38.

Eremomela (?) *elegans* is described from the Djour-country. The proportions of the remiges correspond with the generic characters, but the inner toes are somewhat shorter than the outer. T. von Heuglin, J. f. O. 1864, p. 259.

Eremomela (?) *canescens* is described as a new species from Central Africa, wanting the white ring round the eye. O. Antinori, Cat. Ucc. Affr. centr. p. 38.

MOTACILLIDÆ.

Notiocorys is the name of a new group established for the reception of *Anthus rufus* of Lawrence (from Panama), and characterized by its short, rounded wings, the points of which are formed by four outer primaries of nearly equal length. S. F. Baird, Rev. Am. Birds, pp. 151, 153, 156.

Pediocorys is another new group, characterized by its short, rounded wings, the points of which are formed by five outer primaries, the first shorter than the third. It comprehends *Anthus bogotensis* of Sclater, from Bogota and Ecuador, and a second species, supposed to be from Uruguay, similar in appearance to *Neocorys spraguii*, but having differently formed wings and a rather different coloration. This second species is left unnamed. S. F. Baird, Rev. Am. Birds, pp. 151, 153, 157-159.

TROGLODYTIDÆ.

The genus *Rhodinocichla* heretofore generally placed among the *Dendrocolaptidæ*, appears to belong truly to the *Oscines*, and possibly to the *Troglodytidæ*; and Dr. Sclater is inclined to place it very near *Heleodytes*. S. F. Baird, Rev. Am. Birds, p. 91, note; P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 345.

Campylorhynchus megalopterus of Sclater (*passim*, except Proc. Acad. Philad. 1856, p. 264) is identical with *C. pallescens* of Lafresnaye (Rev. Zool. 1846, p. 93), while *C. pallescens* of Sclater is *C. balteatus*. S. F. Baird, Rev. Am. Birds, pp. 101-103.

"*Cyphorhinus lawrencii*, Scl. MS.", Lawrence, Ann. Lyc. N. York, viii. p. 5 (= *C. cantans*, Lawr. olim, nec Gmel.), is now for the first time completely described. It resembles *C. phæocephalus*, but has a brighter chestnut breast and cinereous belly. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 345.

Heterorhina is proposed as the name of a group of some five species, formerly comprehended in the subgenus *Microcerculus*, with the *Cyphorhinus leucostictus* of Cabanis as its type*. The chief characters of the new group are, tail firm

* This is Professor Baird's first statement on page 114, but on the following page we have "*Heterorhina*, Baird. (Type *Scytalopus prosthleucus*, Sclater)"! 1864. [VOL. I.] G

and "two-thirds the wing" (qu. longer or shorter than?), the nostrils not so much doubly perforate, as with one large oval aperture, divided by a nearly horizontal septum, which shows in the aperture without being united to the anterior margin. The tarsal scales sometimes distinct, sometimes fused. S. F. Baird, Rev. Am. Birds, pp. 114, 115.

Thryophilus is a new genus instituted for a group of species which have before been classed with *Thryothorus*. The bills of the two are the same, but that of the new genus is more notched, nostrils imperforate, and wanting the overhanging membranous scale of *Thryothorus*. No type is assigned to the genus, but *Thryothorus rufalbus* stands first in the species enumerated. S. F. Baird, Rev. Am. Birds, pp. 93-134.

Thryophilus rufalbus from Panama and New Granada differs from a specimen received from Guatemala in having a whiter belly, sides washed with red, the black tail-bands being half as wide as the intervals between them, while in the Guatemalan bird the belly is ashy-white, the sides are without any tinge of red, and the black tail-bands are narrower. This latter is separated as a variety under the name of *poliopleura*. *T. sinaloa* is described as a new species from North-western Mexico. It is smaller than *T. rufalbus*, and is greyish above instead of cinnamon-red; it differs also from the other species of the group. S. F. Baird, Rev. Am. Birds, pp. 128-130.

Troglodytes aedon, from Eastern Mexico, appears to differ slightly from northern specimens, being paler above, and possibly rather smaller, and is distinguished as *var. aztecus*. Examples also of *T. hyemalis* from the western coast of the United States are considerably darker above than those obtained in the east. They also have little or none of the whitish spotting among the dusky bars, the under parts are more rufous, the tarsi shorter and the claws larger. Hence they are distinguished as *var. pacificus*. In like manner eastern specimens of *Cistothorus palustris* have shorter bills and more obsolete markings than western ones. These are distinguished as *var. paludicola*. S. F. Baird, Rev. Am. Birds, pp. 139, 140, 145 and 148.

Troglodytes inquietus is described as a new species from Panama. It was at first considered by Mr. Lawrence (Ann. Lyc. N. York, vii. p. 320) to be the same as *T. hypaëdon*, but it is larger with longer bill and legs. The colours beneath are paler, the lower part of the sides distinctly barred, the upper parts considerably greyer. S. F. Baird, Rev. Am. Birds, p. 143. (Cf. P. L. Slater and O. Salvin, P. Z. S. 1864, p. 346.)

Thryothorus petenicus of Salvin (P. Z. S. 1863, p. 187) agrees almost exactly in size and proportions with *Troglodytes albinucha* of Cabot (Proc. Boston N. H. Soc. ii. p. 258), being only a very little smaller. The coloration and markings are precisely similar, the only difference being in the tail, which is not incompatible with the identity of the two birds. S. F. Baird, Rev. Am. Birds, pp. 149, 150.

Thryothorus atrogularis and *T. thoracicus* are two new species from Costa Rica. The former somewhat resembles *T. coraya*, but has a long strong bill and a black throat; the latter *T. maculipectus*, but has barred wings, distinct markings on the throat and breast, and a stronger bill. Its place seems to be near *T. pleurostictus*; and both these new species belong to the section *Pheugopedius*. O. Salvin, P. Z. S. 1864, p. 580.

PARIDÆ.

Parus castaneiventris is figured. J. Gould, B. As. part xvi.

Ægithalus parvulus is described as new, from the Djour-country. T. von Heuglin, J. f. O. 1864, p. 260.

Auriparus is a new genus established for the reception of the *Ægithalus flaviceps* of Sundevall. The genus is not absolutely characterized, but for the peculiarities authorizing this step we are referred to Prof. Baird's 'Birds of North America' (p. 399). S. F. Baird, Rev. Am. Birds, p. 85.

MALURIDÆ.

Malurus sericyaneus, from Dorey, is described as a new species, $12\frac{1}{2}$ inches long, of which the tail measures $5\frac{1}{2}$. Black, with blue chin, throat, and breast. On the crown a broad, and on the upper neck a narrow silvery ultramarine spot. Upper part of the back, wing-coverts, and exterior of the wing- and tail-quills dull blue. G. von Rosenberg, J. f. O. 1864, p. 119.

TANAGRIDÆ.

Saltator intermedius is described as a new species from Panama, intermediate in colour and markings between *S. magnus* and *S. magnoides*; the crissum is, however, darker than in either of those. It is the *S. magnus* of Lawrence (*nec* Gmelin), Ann. Lyc. N. Y. vii. p. 297. G. N. Lawrence, Proc. Acad. Philad. 1864, p. 106. Mr. Lawrence's opinion opposed, P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 351.

Saltator fulviventris is a new species from Paraguay, not resembling any species with which the author is acquainted, the yellow superciliaries, fulvous under-colouring, and dark tail with an olive upper plumage being peculiar characteristics. G. N. Lawrence, Ann. Lyc. New York, viii. p. 41.

Orthogonys olivaceus is mentioned and figured. J. Cassin, Proc. Acad. Philad. 1864, p. 287, pl. 2.

Calliste lavinæ is figured in Proc. Acad. Philad. 1864, pl. 1. fig. 1; and the three other species of the subgenus *Gyrola* to which it belongs are particularized. J. Cassin, *op. cit.* 1864, pp. 286, 287.

Calliste hannahæ is a new species from the Merida Mountains, Venezuela, resembling generally *C. cyaneicollis*, but larger, with a smaller bill, the abdomen always black (instead of blue), and other differences. J. Cassin, Proc. Acad. Philad. 1864, p. 287, pl. 1. fig. 2.

Euphonia fulvicrissa. Detailed descriptions of both sexes of this species, which must be removed into the vicinity of *E. gouldi*, are given by P. L. Sclater and O. Salvin, P. Z. S. 1864, pp. 349, 350.

Tachyphonus cassini, having both sexes alike, is referred to the group *Eucometis*, and is figured. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 351, pl. xxx.

Tachyphonus tibialis and *T. napensis* are described as new species; the former from Costa Rica, the latter (which is something like *T. surinamus*, but smaller and with a reddish-chestnut instead of a pale fulvous rump) from the Rio Napo. G. N. Lawrence, Ann. Lyc. New York, viii. pp. 41, 42.

Lanio leucothorax is a new species from Costa Rica, allied to *L. aurantius*, but easily distinguishable by its whitish throat. O. Salvin, P. Z. S. 1864, p. 581.

Chlorospingus pileatus is a new species from Costa Rica, hardly resembling any other of the genus. It differs from *C. flavipectus* by its black head with white streaks on either side of it, and from *C. superciliaris* by its stouter bill and the colour of the lower parts. O. Salvin, P. Z. S. 1864, pp. 581, 582.

Tanagra olivina is an undescribed species discovered by Natterer in Brazil, allied to *T. striata*, but differing from that bird by both sexes being similar in plumage, and the yellowish colour of the throat and abdomen. P. L. Sclater, P. Z. S. 1864, p. 607.

PLOCEIDÆ.

Textor castaneoauratus is described as a new species from Central Africa, differing from the *Hyphantornis castaneofusca* of Dr. Hartlaub by its smaller size and yellow abdomen. O. Antinori, Cat. Ucc. Afr. centr. p. 65.

Textor atrogularis and *T. chrysopygus* are described as new species from the Djour-country. The former is very like *T. vitellinus*, but with a yellow cap; the latter resembles the former, but is a little larger and stouter, and with a bright yellow rump: further on (p. 253) the author considers it a doubtful species, and probably the same as *T. vitellinus*. T. von Heuglin, J. f. O. 1864, pp. 245, 246.

Euplectes pyrrhozona, "if new," is described from the Djour-country. T. von Heuglin, J. f. O. 1864, pp. 246, 247. It is probably identical with *E. flammiceps*.

Foudia hamatocephala is described as new from the Djour-country. In form of the bill it resembles the genus *Quelea*, but in distribution of colour it is like *F. erythrops*. T. von Heuglin, J. f. O. 1864, pp. 250-254.

Estrela melanopygia is described as a new species from the Djour-country. Very like *E. astrild*, but with under tail-coverts whitish, and second and third rectrices conspicuously white. T. von Heuglin, J. f. O. 1864, p. 251.

Lagonosticta lateritia is described as a new species from the Djour-country, resembling *L. rufopicta*, but with whitish-grey under tail-coverts. T. von Heuglin, J. f. O. 1864, pp. 251, 252.

Habropyga rara is described as a new species from Central Africa. O. Antinori, Cat. Ucc. Afr. centr. pp. 72, 73.

FRINGILLIDÆ.

Loxia mexicana not distinct from *L. americana*. P. L. Sclater, P. Z. S. 1864, p. 174.

Loxia balearica, A. von Homeyer, Ber. XIV. Versamml. D. O. G. pp. 17, 18. (Error corrected J. f. O. 1864, p. 224.) Some facts respecting this local form of *L. curvirostra* are added to those previously recorded (J. f. O. 1862, pp. 256-258) by its discoverer, the author, who subsequently (J. f. O. 1864, pp. 322-324) expresses his opinion that the birds found by Mr. Tristram in Southern Algeria must belong to *L. balearica*, and gives a table of measurements of this form.

Loxia pityopsittacus, *L. curvirostra* (with young), *L. bifasciata*, and *L. leucopetra* are figured. J. Gould, B. Grt. Br. part v.

Crithagra barbata is described as new from the Djour-country. T. von Heuglin, J. f. O. 1864, pp. 248, 249. It is probably identical with *Serinus icterus* (Vicill.).

Passer salicicola and *P. italia*, for all purposes of science, should be considered as one. C. A. Wright, Ibis, 1864, p. 52.

Passer moabiticus is a new species, having apparently a very limited range near the Dead Sea, where it was discovered by the author. H. B. Tristram, P. Z. S. 1864, pp. 169 and 446.

Serinus meridionalis, remarks on, by Dr. Rohnkert. J. f. O. 1864, pp. 396-398: very numerous near Lisbon, G. F. Mathews, Naturalist, 1864, p. 89.

Serinus aurifrons is described as a new species from Northern Palestine. It would have been supposed to be the *Fringilla syriaca* of Hemprich and Ehrenberg, but the diagnoses are not reconcilable. H. B. Tristram, P. Z. S. 1864, p. 447.

Embernagra superciliosa is a new species from Costa Rica, resembling *F. chloronota* and its allies, but to be distinguished by the conspicuous stripes on the head and its smaller size. O. Salvin, P. Z. S. 1864, p. 582.

Poospiza oxyrhyncha is an undescribed species discovered by Natterer in Brazil, with a much rounded tail, but a typical *Poospiza*. P. L. Sclater, P. Z. S. 1864, p. 608.

Spermophila pileata is an undescribed species discovered by Natterer in Brazil, allied to *S. aurantia*, but differing in the sober colour of its body. Natterer obtained at least eight species of *Spermophila*. P. L. Sclater, P. Z. S. 1864, pp. 607, 608.

Phonipara omissa is thought to be the species found in Porto Rico. E. C. Taylor, Ibis, 1864, p. 167, and P. L. Sclater, *ibid.* p. 405.

EMBERIZIDÆ.

Emberiza pusilla has occurred near Brighton. J. Gould, P. Z. S. 1864, p. 377.

ALAUDIDÆ.

Melanocorypha infusata and *Galerita modesta* from the Kosanga river (Central Africa) are described as new. T. Von Heuglin, J. f. O. 1864, pp. 273, 274.

Galerida (lege *Galerita*) *brachyura*, distinguished from others of the genus by its short tail and long wings, is a new species from the Ghor (Palestine). H. B. Tristram, P. Z. S. 1864, p. 435.

Calandrella hermonensis and *Ammomanes fraterculus* from Palestine are described as new species. The former is larger and more brightly coloured than *C. brachydaetyla*, the latter is smaller and more slender than *A. isabellina*. H. B. Tristram, P. Z. S. 1864, p. 434.

ICTERIDÆ.

Cassicus vitellinus is described as a new species from Panama and Nicaragua, resembling *C. persicus*, but larger than that bird, and differing most markedly in the extent of the yellow on the tail-feathers. It is the *C. icteronotus* of Lawrence (*nec* Vieillot), Ann. Lyc. N. Y. vii. p. 297. G. N. Lawrence, Proc. Acad. Philad. 1864, p. 107.

Cassicus microrhynchus is described as a new species from Panama. It is the *C. uropygialis* of Lawrence (*nec* Lafresnaye), resembling *C. uropygialis*

and the true *C. hæmorrhous* in having a red rump, but to be distinguished from the latter by its much smaller size, and from the former by its smaller and differently-formed bill. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 353.

Icterus baltimore received from Panama, the most southern locality recorded for the species. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 353.

STURNIDÆ.

Gracula intermedia, mimetic powers of. R. H. Schomburgk, Ibis, 1864, pp. 255, 256.

EPIMACHIDÆ.

Seleucides alba (sub nom. *resplendens*), some details of the different stages of plumage and of the habits of the bird, as observed by the author. G. von Rosenberg, J. f. O. 1864, pp. 123-125.

PARADISEIDÆ.

Schlegelia is a new genus, characterized as having the head almost entirely bald, being beset by a few hairs only, and the two middle rectrices in the male very long, recurved and spirally contorted. The type is *Schlegelia calva*, from the interior of Waigiou, previously described by Professor Schlegel (Nederl. Tijdschr. Dierk. 1864, pp. 1, 2), on Dr. Bernstein's authority, as belonging to the group *Diphyllodes*, containing *Paradisea speciosa* and *P. wilsoni*, which two species it resembles in size and form. In the male the top of the head is covered with a bare skin of a very brilliant cobalt-blue, in the female of a dull blue, varied with red and grey. The rest of the head and chin are black, the hind part of the neck and mantle straw-colour. The rest of the back is of a fine red as in *P. regia*. The front of the neck and throat are of a fine deep green with metallic reflexions, the breast and belly are black. In the female the distribution of the colours, especially on the lower parts, resembles that of *Yunx torquilla*. H. A. Bernstein, Nederl. Tijdschr. Dierk. 1864, pp. 320-322.

Paradisea papuana, the changes of plumage are described, and some other notes added by G. von Rosenberg, J. f. O. 1864, pp. 126-129.

CORVIDÆ.

Garrulus taivanus is figured. J. Gould, B. As. part xvi.

Cyanocitta diademata and *C. coronata*. The names perhaps misplaced by Bonaparte, the latter being the bird of the tableland of Mexico. P. L. Sclater, P. Z. S. 1864, p. 175.

Cyanopica cooki. Under the pseudonym of *Pica cyanea* some interesting notes on the habits of this species as observed near Lisbon are given. G. F. Mathews, Naturalist, 1864, pp. 49-51, 69-71.

Urocissa cærulea is figured. J. Gould, B. As. part xvi.

Corvus colonorum is a new species from Formosa, resembling *C. sinensis*, but differing from it by having the feathers of the throat rounded and not lanceolate. R. Swinhoe, Ibis, 1864, pp. 427, 428.

Corvus agricola is a new species from Palestine, resembling *C. frugilegus*, but having a green instead of purple gloss on the feathers, and those of the throat lanceolate as in *C. capensis*. H. B. Tristram, P. Z. S. 1864, p. 444.

Corvus frugilegus is figured, J. Gould, B. Grt. Br. part v. A singular method of capturing this species is described by E. O. Herklotz, Sitzungsber. Ac. Wiss. Wien, 1864, pp. 38, 39.

Corvus megarhynchus is described as a new species from Waigiou, but whether really distinct from the *C. fuscicapillus* of Mr. G. R. Gray (P. Z. S. 1859, p. 157) we are unable to decide. If there is no mistake in the dimensions given, it must be a far larger bird than any of the three species mentioned by Mr. Wallace (Ibis, 1863, p. 101), and yet with wings and tail of much the same length as theirs. H. A. Bernstein, Ned. Tijdschr. Dierk. 1864, pp. 323, 324.

COLUMBÆ.

COLUMBIDÆ.

Ptilonopus chrysogaster. The locality of this species, which is closely allied to several others inhabiting the different island-groups of the South Pacific, is ascertained to be Huahine in the Society Islands. P. L. Sclater, P. Z. S. 1864, p. 9.

Chloranas vinacea from Panama and Guatemala agrees with a typical example of *C. nigrirostris* (from Mexico?). P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 370.

Columba intermedia harboured in Siamese temples. R. H. Schomburgk, Ibis, 1864, pp. 250-252.

Turtur risorius was met with at Constantinople in the Seraglio gardens. E. C. Taylor, Ibis, 1864, p. 410. (Cf. Degland, Orn. Europ. ii. p. 4.)

Turtur semitorquatus has been received from the Comoro Islands and from Madagascar. P. L. Sclater, Ibis, 1864, p. 300; and P. Z. S. 1864, pp. 487, 488.

Streptopelia barbara is described as a new species from Central Africa, strongly resembling the *Turtur semitorquatus* of Swainson, but distinguishable by the colour of the back and tail. O. Antinori, Cat. Ucc. Afr. centr. p. 89.

Ptilopus ochrogaster is described as a new species from Batchian and other localities about New Guinea. H. A. Bernstein, Nederl. Tijdschr. Dierk. 1864, p. 324.

DIDUNCULIDÆ.

Didunculus strigirostris. Two living examples of this curious form were brought to Sydney, New South Wales, in 1863. One a young bird in immature plumage from the island of Upolu, the other an adult from the island of Savaii—both in the group of Navigators' Islands. The plumage of the young bird is described, and notes on the appearance and habits in confinement of both specimens are given. The old bird died after being kept at Sydney about six weeks. The young one was shipped for England. G. Bennett, P. Z. S. 1864, pp. 139-143; Ann. N. H. ser. 3. xiii. p. 259; *idem*, xiv. p. 454; and E. P. Ramsay, Ibis, 1864, pp. 98-100.

The example sent to England arrived safely (P. Z. S. 1864, p. 158), and lived in the Gardens of the Zoological Society for about five months.

GALLINÆ.

PHASIANIDÆ.

Pucrasia xanthospila is a new species, received at the British Museum from North China, through Sir Frederick Bruce. It is distinguishable from the three known species by the buff space on the sides of the neck, and the distinct markings on the tail and upper parts of the body. •G. R. Gray, P. Z. S. 1864, pp. 258-260.

The author likewise mentions the arrival of male and female examples of *Crossoptilon* (lege *Crossoptilum*) *mantchuricum*, which entirely dispel the probability of that species being one of the sexes of *C. auritum*.

Euplocamus praelatus, living in Jardin d'Acclimatation at Paris, L. Fraser, P. Z. S. 1864, p. 159; in Siam, R. H. Schomburgk, Ibis, 1864, pp. 259-261.

Euplocamus swinhooi is figured. J. Gould, B. As. part xvi.

Phasianus pictus obscurus is described as a "*conspecies*" of the well-known *Thaumalea picta*, from which it differs constantly and from its earliest stage, the young when clothed with down being of a reddish-brown, the immature males and adult females being of a deeper tint, especially on the sides of the head and on the breast, and having the auricular region of a uniform brownish-black, while in the adult male the sides of the head and the breast are brown, the frill-feathers are edged with blackish-green, the tail is shorter, and the middle pair of feathers are marked with oblique bands instead of spots. There are also some other variations in the colouring. H. Schlegel, Nederl. Tijdschr. Dierk. 1864, pp. 152-154.

Phasianus soemmeringi. Fourteen living birds of this species were brought to England in June 1864 by Mr. R. Russell, of which two pairs were secured for the Zoological Gardens. P. Z. S. 1864, p. 374.

Numida vulturina has been brought alive from Zanzibar to the Cape of Good Hope. E. L. Layard, Ibis, 1864, pp. 133.

TETRAONIDÆ.

ELLIOT, D. G. Remarks upon a Proposed Arrangement of the *Tetraoninae* or Family of Grouse, and New Genera added. Proc. Acad. Philad. 1864, p. 23.

Dendragapus is a new generic term proposed for *Tetrao obscurus* and *T. richardsoni*, the characters being the possession of gular sacs, and the presence of twenty instead of sixteen rectrices.

Falcipennis is another new genus founded for the reception of *Tetrao falcipennis*, and *hartlaubi* suggested as a trivial name for that species.

ELLIOT, D. G. A Monograph of the *Tetraoninae* or Family of the Grouse. New York: 1864, parts i. and ii. Imp. folio.

Part I. contains figures of *Centrocerfus urophasianus*, *Dendragapus obscurus*, *Pediactes columbianus*, *Canace franklini*, *Bonasa umbelloides*, and *Lagopus leucurus*. Part II. illustrates *Bonasa sabinii*, *Canace canadensis*, *Lyrurus tetrrix*, *Pediactes phasianellus* (*kennicotti*, Suckley), *Bonasa sylvestris*, and *Lagopus scoticus*.

Lagopus albus and *Lagopus scoticus*. The long-pending discussion whether these two birds are to be considered distinct species is still continued.

G. Norman, H. Reeks, E. Newman, J. Cooper, and A. C. Smith, Zool. pp. 8868, 8955, 9044, 9045 and 9113. No new facts of any great importance are adduced by either side.

Lagopus himalayensis from Spitzbergen (*L. alpina* var. *hyperborea*, Gaimard, descr. nulla) may possibly be identical with *L. rupestris*. A. Newton, P. Z. S. 1864, p. 498.

Lagopus mutus in winter, summer (with young), and autumn plumage forms the subject of three fine pictures from Mr. Wolf's pencil. J. Gould, B. Grt. Br. part vi.

Under the name of *Sterna palustris*, Demeezemaker, a variety, perhaps a local race, of *Perdix cinerea* is treated of. L. Olph-Gaillard. Ibis, 1864, pp. 225-227.

Caccabis petrosa has been obtained in the Tuscan Maremma, and *C. græca* is also found in Tuscany. H. Benvenuti, Ibis, 1864, p. 228.

Oreoperdix is a new genus proposed by Mr. Swinhoe for a new Partridge discovered by him in Formosa. It approaches most nearly to *Caccabis*, but differs in having unsprung tarsi, a short tail, and a thick bill.

O. crudigularis is the type species on which the genus is founded. R. Swinhoe, Ibis, 1864, pp. 425, 426.

Bambusicola sonorivox is figured. J. Gould, B. As. part xvi.

Odontophorus guianensis of Lawrence (from Panama) is identified with *O. marmoratus*. P. L. Sclater and O. Salvin, P. Z. S. 1864, p. 371.

Odontophorus melanotis is a new species from Costa Rica, resembling *O. erythropus*, but to be distinguished by the black subocular patch. O. Salvin, P. Z. S. 1864, p. 586.

PTEROCLIDÆ.

Syrhaptes paradoxus: its habits in captivity, *L. Holtz*, J. f. O. 1864, pp. 52-58; its occurrence in Wittow and Rügen, *Idem*, op. cit. pp. 58, 59 and 395, 396; in Great Britain, *Idem*, op. cit. p. 60; in Posen, *Alexander von Homeyer*, op. cit. pp. 61, 62: its habits in captivity, *Idem*, op. cit. pp. 312-314: its occurrence and breeding in Jutland, *W. Hintz I.*, op. cit. p. 68: its occurrence in Pomerania, *Wiese*, op. cit. pp. 68, 69 (error corrected, p. 69), *A. von Homeyer*, op. cit. p. 140, *W. Hintz I.*, op. cit. p. 194; in Holland, *J. Cuhanis*, op. cit. p. 69; in Silesia, *A. von Homeyer*, op. cit. p. 76; on Bornum (third article), *B. Altum*, op. cit. pp. 97-102 (*potius* pp. 81-86); near Danzig, *Böck*, op. cit. p. 140; in Mecklenburg, *Von Preen*, op. cit. p. 218; in Norfolk and Suffolk, *H. Stevenson*, op. cit. pp. 297-311 (translated by Dr. Altum from 'Zoologist,' 1863) and Zool. p. 8957; in Germany, *E. Opel*, J. f. O. 1864, p. 312: its food, *F. Schweitzer*, op. cit. p. 312: its occurrence and breeding in Denmark, *J. Reinhardt*, op. cit. pp. 339-352 (translated by Dr. Altum from Vidensk. Meddelels. Kjöbenh. 1863, pp. 213-235), and *A. Newton*, Zool. p. 8889: its occurrence in Europe, *V. Fatio*, Rev. Zool. 1864, pp. 122-127; near Metz, *E. de Saulcey*, op. cit. pp. 127, 128; in Wiltshire, *A. C. Smith*, and in Shetland, *H. L. Sarby*, Zool. p. 8888; in Caithness, *H. Osborne*, op. cit. p. 8889; in Cheshire, *T. J. Moore*, loc. cit., and *J. Cooper*, op. cit. p. 8958; in Moray, *G. Gordon*, op. cit. p. 8889: in Ireland, *Lord Clermont*, op. cit. p. 8934; in Somerset, *V. R. Perkins*, op. cit. p. 8957; in Devon, *J. L. L. Fulford* and *M. A. Mathews*, op. cit. p. 8958; near Dor-

noch, *T. Mackenzie*, *op. cit.* p. 8959; in France and Germany (with remarks on its affinities), *L. O. Gaillard*, *Ibis*, 1864, pp. 129, 130; in Italy, *T. Salvadori*, *op. cit.* pp. 228, 229; in Belgium, *E. de Selys Longchamps*, *Bull. Acad. Belg.* 1864, pp. 22-25; in Northumberland and Durham, *J. Hancock*, *Trans. Tyne-side Nat. Field Club*, 1864, pp. 100-103; in Norway, *R. Collett*, *Nyt Mag. Naturvid. For. Christiania*, iii. part 3, pp. 176, 177.

NEWTON, A. The Irruption of *Syrnhaptes paradoxus* (with a map, plate vi.). *Ibis*, 1864, pp. 185-222.

The author, after referring to the bibliography of the species, quotes Radde's experience of it in South-eastern Siberia (*Bericht über Reisen in Süden von Ost-Sibirien*, pp. 373-417), to prove that *Syrnhaptes* is subject to sudden and almost capricious movements on a very large scale, which he thinks may help to explain the remarkable visitation of 1863. He then shows that the records stating that it appeared in Europe between 1859 and 1863 are erroneous, and compiles, from various sources, information respecting the bird's appearance in 148 European localities, in the year last named, from Galicia to Donegal, and from Gascony to the Færoes. The earliest date given is 6 May in Moravia; by the end of that month the furthest point towards the north-west had been reached. The main body does not seem to have reached England, a flock of about 100 being the largest recorded as observed in this country, while several bands of at least as many continued to haunt various places on the Continent. At the beginning of October between 150 and 200 were seen in Rügen flying towards the south-east, and probably making for the land of their birth. The strength of the invading force is estimated at not less than 700. In Jutland and Holland they bred. After considering and rejecting the various causes assigned by different writers as likely to have produced this movement, the author states his belief that it was merely the natural overflow of the population of *Syrnhaptes* resulting from its ordinary increase, and that the immigrants were seeking new settlements. The species first got its foot in Europe in 1853; in 1859 it came again; and in 1863, owing to the same increasing pressure from within, still more start and come still further. If this hypothesis be correct, another outpouring may be safely predicted. The conclusion of the article strongly condemns the wanton slaughter of these volunteers for acclimatization.

MEGAPODIIDÆ.

Megapodius pritchardi is a new species from the island of Nina Fou. G. R. Gray, *P. Z. S.* 1864, p. 41, pl. vi., and *Ann. & Mag. N. H.* ser. 3. vol. xiv. p. 378. Mr. Gray adds to his account of this bird a list of the twenty-one species of this family known to him, of which there are specimens of eighteen in the British Museum.

TINAMIDÆ.

PARKER, W. K. On the Osteology of Gallinaceous Birds and Tinamous. (See under heading "Descriptive Anatomy.")

GRALLÆ.

RALLIDÆ.

Porphyrio martinica (?). The so-called "Carpenter Coot" has generally been considered to be the young of this species, but it is stated that the nestlings are quite different. W. T. March, Proc. Acad. Philad. 1864, p. 69.

Porzana maruetta (with young), *P. minuta* and *P. pygmæa* are figured. J. Gould, B. Grt. Br. part vi.

SCOLOPACIDÆ.

SCHLEGEL, H. Muséum d'Histoire Naturelle des Pays-bas. 5^{me} et 6^{me} Livraisons. *Scolopaces*. Leyde, 1864. Royal 8vo, pp. 102.

This portion of the Catalogue of the Leyden Museum being still unfinished, it is only needful for us here to say that the parts published contain the genera *Scolopax* and *Gallinago*, *Rhynchæa*, *Prosobonia*, *Limosa*, *Tringa*, *Phalaropus*, *Totanus*, *Actitis*, and *Numenius*. We reserve for the completion of the group further remarks upon it. Compelled as we are in some cases to differ widely from Professor Schlegel's opinions, it is right for us to mention the great care with which his most useful catalogues are drawn up, and to acknowledge that it is, in the present state of our science, far better to reduce than to multiply the number of genera and species, when this can be safely done.

COINDE, J. L. Note pour servir à l'histoire des Oiseaux insectivores. Rev. Zool. 1864, pp. 5, 6.

The communication records some cursory observations on the diet of a bird belonging "à la famille des échassiers riverains du genre chevalier." The species is not determined.

Gallinago megalæ (Ibis, 1861, p. 343) from China and Formosa tallies well with the description of *G. solitaria* from Japan, and may be identical with it. R. Swinhoe, Ibis, 1864, p. 370.

Ereunetes occidentalis is described as a new species from the west coast of North America, differing from *E. pusillus* in the greater amount and brightness of the chestnut on the upper parts, but most conspicuously in the more decided spotting of the breast and sides. The bill also appears on an average to be longer, and the tarsi and toes are jet-black. *E. mauri* from Cuba agrees precisely with *E. pusillus*. G. N. Lawrence, Proc. Acad. Philad. 1864, pp. 107, 108.

Micropalama tacksanowskii is identical with *Macrorhamphus semipalmatus*. T. C. Jerdon, B. India, iii. p. 680.

Numenius rufescens is figured. J. Gould, B. As. part xvi.

CHARADRIIDÆ.

Recurvirostra avocetta with young is figured. J. Gould, B. Grt. Br. part v.

Streptopelia interpres is stated to breed in Jamaica, at the seaside, on the plains and in the mountains. So far as a description of the appearance of the eggs found can be depended upon, they would seem to tally with those which have been hitherto brought only from comparatively high northern latitudes; but nothing is said to show whether or not the Jamaican specimens have been fully identified as belonging to this species. W. T. March, Proc. Acad. Philad. 1864, p. 66.

Charadrius plumalis in summer (with young) and winter is figured. J. Gould, B. Grt. Br. part v.

Hemerodromus cinctus has been obtained in the Bari Negro-land in Central Africa. A. von Pelzeln, Ibis, 1864, p. 231. On Mr. Blyth's authority it is stated that this bird certainly belongs to the genus *Rhinoptilus*. T. C. Jerdon, B. India, iii. p. 629.

OTIDIDÆ.

Otis denhami seems to have occurred in the Djour-country. T. von Heuglin, J. f. O. 1864, pp. 272, 273.

Otis tarda, with young, and *O. tetrax* are figured. J. Gould, B. Grt. Br. part v.

GRUIDÆ.

HOMeyer, EUGEN VON. Ueber die Rückenfärbung des brütenden Kranichs. J. f. O. 1864, pp. 337-339.

Remarks on Conservator Meves's paper on the same subject (Æfvers. K. Vet.-Akad. Förh. 1860, p. 218; J. f. O. 1862, pp. 132, 133). The staining of the feathers in *Grus cinerea* is not accidentally caused; the author has observed the bird trimming its plumage, and anointing them with peat-soil.

ARDEIDÆ.

Garzetta nivea is stated to be distinct from *Florida cærulea*, of which it has been generally supposed to be the immature; but further evidence is required to establish its specific value. W. T. March, Proc. Acad. Philad. 1864, p. 63.

Ardea occidentalis is still considered distinct from *Herodias egretta*; but the specific (not to say generic) characters are exactly contrary to those given as diagnostic by Prof. Baird (B. N. Am. p. 670)! W. T. March, Proc. Acad. Philad. 1864, p. 63.

Ardea wuerdemanni is considered by the fishermen and gunners of Jamaica to be the male of *A. herodias*. They are probably right, but their view of the case is controverted. W. T. March, Proc. Acad. Philad. 1864, pp. 63, 64.

Butorides brunescens, if distinct from *B. virescens*, has not been recognized in Jamaica, though supposed to be found there. W. T. March, Proc. Acad. Philad. 1864, p. 64.

Nycticorax griseus. Notice of a colony on the Seeburger-See in Hanover. B. Wicke, Journ. f. Orn. 1864, pp. 77-80. Its occurrence in Sweden. F. Wahlgren, Æfvers. K. Sv. Vet.-Akad. Förhandl. 1864, p. 77.

Botaurus stellaris, with young, is figured. J. Gould, B. Grt. Br. part vi.

CICONIIDÆ.

Ciconia pruyssenaeri is described from the marshes of the Req-negroes (Central Africa). T. von Heuglin, J. f. O. 1864, p. 275, and Ibis, 1864, p. 430.

Platalea major varies extremely in size. R. Swinhoe, Ibis, 1864, pp. 364-370.

TANTALIDÆ.

Ibis strictipennis. Examples supposed to belong to this species have been obtained from the north coast of Ceram, and the east of Salawatty, New Guinea. G. von Rosenberg, J. f. O. 1864, pp. 136, 137.

Eudocimus albus (?) is stated to have "the power of inflexing the upper bill, so as to run it along the groove of the lower mandible, and clean out whatever may be adhering there." R. Hill, Proc. Acad. Philad. 1864, p. 65, note. Further on (p. 68, note) the same naturalist expresses a doubt whether the bird to which this extraordinary power is ascribed is not a *Numenius*.

PALAMEDEIDÆ.

Chauna nigricollis is a third species of the genus from New Granada, in its distinct white throat and black neck agreeing with *C. derbiana* from Guatemala, but in general coloration approaching *C. chavaria* from Brazil. The author gives diagnoses of the three known species. Several living specimens of the newly described species were presented to the Zoological Society in 1863 by Mr. Greey. P. L. Sclater, P. Z. S. 1864, pp. 74-76. pl. xi.

PARKER, W. K. On the Systematic Position of the Crested Screamer (*Palamedea chavaria*) [lege *Chauna nigricollis*]. Ann. & Mag. Nat. Hist. 3 ser. xiv. pp. 144-150. (From P. Z. S. 1863, pp. 511-518.)

From his examination of the skeleton, but chiefly relying on the bones of the head and wings and the number of the caudal vertebrae, the author comes to the conclusion that the bird "may be a very *lacertian* Goose," and further states that "there are parts of its organization which make it very probable that it is one of the nearest living relatives of the marvellous *Archæopteryx*."

AVIS INCERTÆ SEDIS.

Rhinocetus jubatus, G. Bennett, Ann. & Mag. N. H. 3 ser. xiii. pp. 342, 343 (from P. Z. S. 1863, pp. 385, 386), and *op. cit.* xiv. pp. 141, 142 (from P. Z. S. 1863, pp. 439, 440). A few short observations on this curious form. The female is much larger than the male. They are becoming scarce in New Caledonia. M. F. Joubert informs the author that there are two kinds, which he designates as the "Bush-Kagu" and the "Grass-Kagu."

The abstract of Mr. Parker's paper on the Osteology of this bird will be found noticed under the heading 'Descriptive Anatomy.'

ANSERES.

ANATIDÆ.

Cygnus olor (?). Cygnets clad in down, obtained in the Dobrudscha, July 1863, by Herr Zelebor, are doubtfully referred to this species. A. von Pelzeln, Journ. f. Orn. 1864, p. 71.

Cygnus olor and *C. musicus* are figured. C. J. Sundevall, Sv. Fogl. pl. lvi.

Anser brachyrhynchus is the large species of Goose frequenting Spitsbergen, which has been taken to be *A. segetum* by Malmgren (Öfvers. K. Vet.-Akad. Förh. 1863, p. 107), and *A. cinereus* by Torell (*op. cit.* p. 115) and Evans and Sturge (Ibis, 1859, pp. 171, 172). A. Newton, P. Z. S. 1864, 498.

Anser cinereus and *A. segetum* are figured. C. J. Sundevall, Sv. Fogl. pl. lvi.

Anser albifrons, *A. minutus* (sc. *erythropus* (Linn.)), *A. leucopsis*, and *A. torquatus* are figured. C. J. Sundevall, Sv. Fogl. pl. lvii.

SCLATER, P. L. Notes on the Species of *Tadorna* living in the Society's Gardens. P. Z. S. 1864, pp. 189-192.

A diagnostic list, with full notes, of the six known species of the genus—in which the author includes *Casarca*—is given, as well as figures of *T. tadornoides* and *T. variegata* (plates xviii. and xix.), the imperfections of former illustrations of these two species being commented upon. The rare *Anas navosa*, Gould, considered to be a *Tadorna* by some naturalists, is not so regarded by Dr. Sclater.

SCLATER, P. L. Note on the Geographical Distribution of the Ducks of the Genus *Dendrocygna*. P. Z. S. 1864, pp. 299-301.

A synonymic list, with full notes of the eight species known to the author, two of which—" *D. guttulata*, Müll. MS." and *D. vagans*, Eyton, are probably still undescribed. There are examples of the first in the British Museum and in Mr. Wallace's collection. Two other apparent species, *D. fulva* and *D. virgata*, not yet met with by Dr. Sclater, are also referred to. *D. viduata*, which is found both in Africa and South America, is suggested to have been introduced into the latter country by the early slavers. The Madagascar species is identical with *D. major* of India, and not, as heretofore believed, *D. arcuata*.

Anas melleri is described as a new species from Madagascar, belonging to that section of the group of true *Anas* in which the sexes are alike. It is the *A. xanthorhynchus* of Mr. Edward Newton (Ibis, 1863, p. 174), but not of Forster. P. L. Sclater, P. Z. S. 1864, p. 487. pl. xxxiv.

Anas maxima of Gosse, whether a hybrid or a variety of *A. boschas*, is stated to be a permanent resident in Jamaica. Some very inconclusive evidence afforded by certain eggs is adduced as bearing upon the point. W. T. March, Proc. Acad. Philad. 1864, p. 71.

Anas tadorna, *A. boschas*, *A. penelope*, and *A. clypeata* are figured. C. J. Sundevall, Sv. Fogl. pl. lviii.

Anas acuta, *A. querquedula*, and *A. crecca* are figured. C. J. Sundevall, Sv. Fogl. pl. lix.

Cairina moschata. The English name of this species is said to have been corrupted from that of the "Muisca" Indians, whence is derived Muscovy Duck. W. T. March, Proc. Acad. Philad. 1864, p. 72.

Hybrids between *Anas boschas* and *A. crecca*, *A. acuta* and *A. penelope*, *A. sponsa* and *A. boschas* (var. *domestica*), and *A. galericulata* and *A. boschas*

(var. *domestica*) are described. J. P. van Wickevoort Crommelin, Nederl. Tijdschr. Dierk. 1864, pp. 294-297.

Nyroca leucophthalma is stated to have occurred in Jamaica, but to be very rare there. Probably some other species has been mistaken for this bird. W. T. March, Proc. Acad. Philad. 1864, p. 72.

Fulix (sc. *Somateria*) *mollissima* and *F. spectabilis* are figured. C. J. Sundevall, Sv. Fogl. pl. lx.

LARIDÆ.

COUES, ELLIOTT. Notes on certain Central-American *Laridæ*, collected by Mr. Osbert Salvin and Mr. F. Godman. Ibis, 1864, pp. 387-393.

Three species of *Larinæ* and twelve of *Sterninæ* (one being doubtful) are critically treated of.

Gygis —. What appears to be a new species from the Feejee Islands is characterized but left unnamed by G. Hartlaub, Ibis, 1864, p. 232.

Chroicocephalus tibetanus. A fine and apparently new species, brought from Tibet by Major Hay. J. Gould, P. Z. S. 1864, p. 54; Ann. & Mag. N. H., ser. 3. xiv. p. 379.

Rhodostethia rossi has occurred in the Færoes. J. C. H. Fischer, Kröy. Naturh. Tidsskr. 1864. (Cf. Ibis, 1865, pp. 103, 238.)

Stercorarius pomatorhinus, its autumnal migration southward in Ireland. R. Warren, jun., Proc. N. H. Soc. Dublin, iv. pp. 3-5, J. Kinahan, *ibid.* p. 9, and J. C. Neligan, *ibid.* p. 40.

PROCELLARIIDÆ.

COUES, ELLIOTT. A critical Review of the Family *Procellariidæ* [lege *Procellariidæ*]: Part I., embracing the *Procellariæ* or Stormy Petrels. Proc. Acad. Philad. 1864, pp. 72-91. Part II., embracing the *Puffinæ*. *Ibid.* pp. 116-144.

The author divides the *Procellariidæ* into three subfamilies, which he calls *Diomedeinæ*, *Procellarinæ*, and *Halodrominæ*; in the first the nasal tubes are entirely disconnected and placed one on each side of the bill, in the second they are united, and open more or less horizontally forwards, in the third their apertures are directed vertically upwards. Dr. Coues further divides the *Procellariinæ* into five divisions, termed *Fulmareæ*, *Daptioneæ*, *Prioneæ*, *Puffinæ*, and *Procellariæ*; these last he separates into two groups, to which no names are assigned. The first contains four genera: *Oceanodroma*, with *P. furcata* of Gmelin as its type; *Cymochorea*, equivalent to *Thalassidroma* of authors (which name is altogether dropped as being synonymous with *Procellaria* proper of Linnaeus); *Halocyptena* for the reception of a single and hitherto unknown species; and *Procellaria* as restricted by Bonaparte. The second group is composed of *Oceanites*, *Fregetta*, and *Pelagodroma*. As might be expected, these so-called genera approach each other so nearly,

as not to be defined except at a very great expenditure of words, and it is utterly impossible in a small space to attempt to give a notion of their asserted characters.

Cymochorea homochroa is described by Dr. Coues as a new species from the Farallone Islands, Pacific Coast of North America, not very much unlike *C. melania*, but much smaller, and entirely brownish-black with a cinereous tinge. One of the type-specimens has been figured (Atlas B. N. A. pl. 99. fig. 2) as *Thalassidroma melania* (*loc. cit.* pp. 77 & 90).

Halocyptena microsoma is described by the same author as the type species of his new genus (noticed above) from the Farallone Islands, Pacific Coast of North America. In one place Dr. Coues says, "It is the smallest known Petrel," but in another that it "hardly exceeds in size the little *G. [?] pelagica*!" entirely fuliginous black, length of wing 4.75 inches! (*ibid.* pp. 79 & 90).

In his second paper Dr. Coues regards the *Puffinæ* as composed of five genera, *Majaqueus*, *Adamastor*, *Thiellus*, *Nectris*, and *Puffinus*; it is satisfactory to learn that he thinks the further subdivision of *Puffinus* into *Ardenna* and *Priofinus* "quite unwarrantable." The five genera adopted are characterized with as much minuteness as those in the former paper. The whole of this paper is drawn up with the singular amount of patient investigation which distinguishes Dr. Coues's 'Reviews' of perplexing groups; and the present writer can but regret he is obliged to withhold his assent to many of the views maintained in it.

Nectris amaurosoma is described as a new species from Cape San Lucas, having the bill of the same colour as the plumage, the feet fleshy-white, outer side of tarsus and outer toe tinged with dusky, lower wing-coverts mostly white (*loc. cit.* pp. 124 & 143).

Puffinus creatopus is described from the MS. of Mr. J. G. Cooper as a new species from San Nicholas Island, California, with the general aspect of *P. major*, but having flesh-coloured feet, and other distinguishing points (*ibid.* pp. 131 & 144).

Puffinus opisthomelas is described as a new species from Cape San Lucas, generally like *P. obscurus*, but larger and, among other differences, with almost all the under tail-coverts and axillaries fuliginous black (*ibid.* pp. 139 & 144).

Thalassidroma melitensis of Schembri is only *T. pelagica*, the variations in the white markings of the tail-feathers being observable in specimens from other parts of Europe. C. A. Wright, *Ibis*, 1864, p. 154.

Thalassidroma — (sp. innom.) digs its breeding-holes itself in the ground, using its bill as a pickaxe, and throwing behind it the loose earth with its feet. J. Ambrose, *Trans. Nov. Scot. Inst. Nat. Sc.* 1864, pp. 34-37.

PELECANIDÆ.

Graculus (sc. *Phalacrocorax*) *carbo* and *G. cristatus*, and *Dysporus* (sc. *Sula*) *bassana*, are figured. C. J. Sundevall, *Sv. Fogl.* pl. lv.

PODICIPIDÆ.

Podiceps, sp. ? The sacred bird (reported to be wingless) of the Lake Zalanza in Joanna, one of the Comoro islands, proved to be of this genus, but the species was not ascertained. P. L. Slater, *Ibis*, 1864, p. 301.

Podiceps cristatus, *P. rubricollis*, *P. auritus* of Linnæus, and *P. minor* are figured. C. J. Sundevall, *Sv. Fogl. pl. liv.*

COLYMBIDÆ.

Colymbus torquatus (sc. *glacialis*) and *C. adamsi*. Crania of these two birds compared and their specific distinctness thereby more completely substantiated. E. Coues, *Proc. Acad. Philad.* 1864, pp. 21, 22.

Colymbus septentrionalis, *C. arcticus*, and *C. glacialis* are figured. C. J. Sundevall, *Sv. Fogl. pl. liii.*

ALCIDÆ.

Alca impennis,—Natural Mummies, A. Newton, *Ann. N. H.* 3 ser. xiv. pp. 138–141, *Zool.* pp. 9122–9124 (from P. Z. S. 1863, pp. 435–438), J. E. Gray, *Ann. N. H.* 3 ser. xiv. p. 319. List of existing specimens, R. Champley, *op. cit.* pp. 235, 236; Defects in Mr. Champley's List, P. L. Slater, *op. cit.* p. 350, A. von Pelzeln, and Eds. *Ann. N. H. op. cit.* p. 393.

STRUTHIONES.

STRUTHIONIDÆ.

Struthio camelus, the skin of a specimen killed in the Belka (Palestine) was obtained by H. B. Tristram, P. Z. S. 1864, p. 449.

Casuaris kauyi. Some further particulars respecting this bird are given by its discoverer, G. von Rosenberg, J. f. O. 1864, p. 134.

Casuaris bennetti. Recently hatched specimens of this species, and the skeleton of the typical example, were exhibited to the Zoological Society. P. L. Slater, P. Z. S. 1864, p. 271.

Dinornis robustus. One of the most remarkable ornithological events of the past year was the exhibition by Mr. Thomas Allis of the very recent remains of a Moa, at the meeting of the Linnean Society on the 16th of June, 1864. (*Proc. Linn. Soc.* vol. viii. p. xlv.) The paper read by that gentleman has not, however, yet been published. An abstract of its contents is given in 'The Natural History Review' (1864, page 636), and also in 'The Zoologist' (pages 9195–9197). The skeleton is described as being very nearly perfect. The left inner toe (that which in *Casuaris* is armed with a very long claw) "has the whole of the outer sole still adhering to it, as well as part of the sole of the foot. On the lower part of the back is still a considerable portion of the outer skin studded with the quill part of the feathers, and in one or two rare instances portions of the web of the feather." These feathers we understand are of the duplex type common to the section *Casuarinæ*, i. e. the aux-
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iliary plume nearly equals the feather itself. The remains were found in a sand-hill about 100 miles from Dunedin in the Middle Island. Underneath them were eggs, as if the bird had been incubating at the time it was overwhelmed by a sand storm; and hence the probability is that it was of the male sex. Bones of five individual embryos were sent home with those of the parent. The specimens are in the Museum of the Yorkshire Philosophical Society at York, and an excellent series of photographs of them has been published. The species to which the bones are referred is said to be *D. robustus*. The specimens are placed at Prof. Owen's disposal for description (P. Z. S. 1864, pp. 648, 649).

Dromæus irroratus. Some notes on this bird breeding in confinement. W. Bennett, Zool. pp. 9200-9206.

ROWLEY, GEORGE DAWSON. A Paper upon the Egg of *Æpyornis maximus*, the Colossal Bird of Madagascar. London, 1864. 8vo, pp. 15.

The author somewhat minutely describes a specimen of the egg of this remarkable bird, which is stated to have been found at "Mananzari," on the east coast of Madagascar, at a depth of 45 feet, in a hill of ferruginous clay, and sent to Mauritius in 1858. It was subsequently exhibited in the International Exhibition of 1862, and he is now the possessor of it. Its major axis is $12\frac{1}{4}$ inches, minor axis $9\frac{3}{8}$ inches, great circumference $34\frac{2}{5}$ inches, small circumference $29\frac{1}{8}$ inches, and weight nearly 3 lbs. $11\frac{1}{2}$ oz. avoirdupois. It would therefore seem to be intermediate in size to the two well-known specimens in the Museum at Paris. Mr. Rowley strives to show that the bird must have exceeded in bulk the largest species of *Dinornis*, and cites much of the information respecting *Æpyornis* which had been previously published by Isidore Geoffroy St.-Hilaire and Professor Owen.

APTERYGIDÆ.

Apteryx mantelli. A second living example of this species has been presented to the Zoological Society, and placed along with the female bird received in 1851, which still continues in good health. P. Z. S. 1864, pp. 374, 375.

REPTILIA

BY

ALBERT GÜNTHER, M.A., M.D., Ph.D.

A. *Works in progress.*

Iconographie générale des Ophidiens, par Monsieur le Professeur
G. JAN. Paris. Text 8vo, Plates 4to.

According to the prospectus, this work is issued in parts, each containing six plates of engravings, and appearing at intervals of two months. The plates will not be published in a systematic series, but will precede the text, which is also to appear in parts, each containing the monography of a family. Up to the present time eight parts of plates have been issued, viz. No. 1 in 1860, December; No. 2 in 1861, December; No. 3 and No. 4 in 1864, April; No. 5 in June; No. 6 in August; No. 7 in November; No. 8 in December. Of the text one part (42 pages) has appeared (1864, October); it contains the family of *Typhlopidae*.

There is no doubt that the additions to our knowledge of Ophidians since the publication of the 'Erpétologie générale, par Duméril et Bibron,' have been so numerous and important, that we have not one work which could make any claim to completeness, and that, consequently, a general work on Ophidians is now a great desideratum. Unfortunately M. Jan does not supply such a work, as he intends to figure and to describe only those species which he has been able to examine at his own place of residence; and as the British Museum alone possesses at least as many species as the thirty-five collections together from which he borrowed the specimens, it is evident that the 'Iconographie générale' cannot contain many more than two-thirds of the species known.

Still, even an incomplete work, illustrated by well-drawn plates, might have been a most valuable contribution to Herpetology if the author had a tolerable acquaintance with the subject chosen and with the literature relating to it. But Dr. Peters has shown on several occasions (Wiegmann's Arch. 1861, p. 35; Monatsber. Acad. Wiss. 1863, p. 368) that the little which has been published by M. Jan abounds with such serious errors, that great caution is needful in making use of his labours.

Of course, the author has had frequent opportunity of proposing new generic names, but we know of only one other instance in which an author has shown a similar want of knowledge of the rules of nomenclature, and even of linguistic rudiments: *Plastoseryx*, *Leiosophis*, *Cosmiosophis* are specimens of M. Jan's productions in this line.

The plates are very well drawn, and, after some errors to be mentioned hereafter have been corrected, they will facilitate the determination of species. Everybody who knows the amount of time and labour required for the drawing of snakes will excuse M. Jan for giving only partially executed drawings of the specimens.

Anatomische Abhandlungen über die Perennibranchiaten und Derotremen. Von J. G. FISCHER. Erstes Heft. Hamburg, 1864. 4to (172 pages and 6 plates).

This work is purely anatomical; the first part contains the anatomy of the visceral arches (hyoid and branchial), their muscles, and the cerebral nerves. The author has made his researches on *Siren lacertina*, *Axolotl*, *Proteus*, *Menobranchus lateralis*, *Amphiuma tridactylum*, *Menopoma alleghaniense*, *Cryptobranchus japonicus*, and *Siphonops annulatus*. The last-named species has been included in these researches, because the structure of the hyoid bone is typically entirely different from that of other Batrachians.

B. *Separate Publications.*

The Reptiles of British India. By ALBERT C. L. G. GÜNTHER. London: published for the Ray Society by Robert Hardwicke. 4to (444 pages and 26 plates).

This work comprises the entire Reptilian fauna of the continent of India, from the country drained by the Indus to the temperate regions of China. A sketch of the geographical distribution of the species over this immense area precedes the systematic index. The author gives descriptions of 526 species, a very small proportion of which have not been examined by himself; many are new to science, and they, with those which have been figured, will be mentioned below. In order to facilitate the study of Reptiles, and to diffuse their knowledge among naturalists and residents in India, the author has added detailed descriptions of the characters of the orders and families, with explanations of the scientific terms. He has collected everything that is known of the habits of these animals. The plates, generally containing figures of the natural size, are admirably drawn on stone by Mr. G. H. Ford.

C. Papers published in Journals.

DUMÉNIL, A. Catalogue méthodique de la Collection des Batraciens du Muséum d'Histoire naturelle de Paris. Mém. Soc. Sc. Nat. Cherbourg. ix. 1863 (pp. 27, with a plate).

Prof. Duméril has commenced the publication of a catalogue of the rich collection of Batrachians in the Paris Museum, of which the first part, containing the Cæcilians, has appeared. He continues the history of this branch of Herpetology from the period of the publication of the 'Erpétologie générale,' and gives diagnoses of the genera and species. The Paris Museum contains 14 species of Cæcilians, one of which is new; the heads and scales of several species are figured.

STRAUCH, A. Charakteristik zweier neuen Eidechsen aus Persien. Bull. Acad. Sc. de St. Pétersb. 1863, vi. (1863, September 18).

REINHARDT, J. Om en ny Slægt af Slangefamilien *Rachiodontidae*. Oversigt D. Vid. Selsk. Forhandl. i Dec. 1863. Kjöbenh. 1864 (pp. 198-210, with a plate).

GRAY, J. E. Notes on certain species of Tortoises from the Asiatic Islands, transmitted to the British Museum by Dr. Bleeker. Proc. Zool. Soc. 1864, January 12 (pp. 11-13).

PETERS, W. Ueber die Eidechsen-Familie der Scincoiden, insbesondere über die Schneider'schen, Wiegmann'schen und neue Arten des zoologischen Museums zu Berlin. Monatsber. Acad. Wiss. Berlin, 1864, January 14 (pp. 44-58).

KREFFT, G. Description of *Aspidiotes melanocephalus*, a new snake from Port Denison. Proc. Zool. Soc. 1864, January 26 (pp. 20-22, with a woodcut).

FRAUENFELD, G. v. Ueber in der Gefangenschaft geborne Jungen von *Salamandra maculosa* (Laur.). Verhandl. Zool.-bot. Gesellsch. Wien, 1864, February 3 (pp. 121-124).

GÜNTHER, A. Third contribution to our knowledge of Batrachians from Australia. Proc. Zool. Soc. 1864, February 9 (pp. 46-50, with a plate).

GRAY, J. E. Notes on some new Lizards from South-Eastern Africa, with the descriptions of several new species. Proc. Zool. Soc. 1864, February 9 (pp. 58-63, with a plate).

GRAY, J. E. Revision of the species of *Trionychidae* found in Asia and Africa, with the descriptions of some new species. Proc. Zool. Soc. 1864, February 23 (pp. 76-98, with woodcuts).

GÜNTHER, A. On the Reptiles and Fish obtained by Capt.

- Speke during the East-African Expedition. Proc. Zool. Soc. 1864, March 8 (p. 115, with a plate).
- GRAY, J. E. Additional observations on *Dermatemys* from Central America. Proc. Zool. Soc. 1864, March 8 (pp. 125-127).
- GRAY, J. E. Description of a new species of *Staurotypus* (*S. salvinii*) from Guatemala. Proc. Zool. Soc. 1864, March 8 (pp. 127-128).
- GRAY, J. E. On the genera of *Chelydidae* and the characters furnished by the study of their skulls. Proc. Zool. Soc. 1864, March 8 (pp. 128-135, with woodcuts).
- PETERS, W. Ueber neue Amphibien. Monatsber. Acad. Wiss. Berlin, 1864, April 18 (pp. 271-276, with a plate).
- BEDDOME, R. H. Description of a new species of *Elaps* from Malabar. Proc. Zool. Soc. 1864, April 26 (p. 179).
- KREFFT, G. Description of three new species of Australian Snakes. Proc. Zool. Soc. 1864, April 26 (pp. 180-182, with woodcuts).
- STEINDACHNER, F. Batrachologische Mittheilungen. Verhandl. Zool.-bot. Gesellsch. Wien, 1864, May 4 (pp. 239-288, with 9 plates); and Zusätze und Berichtigungen zu den batrachologischen Mittheilungen. *Ibid.* (pp. 551-552).
- PETERS, W. Eine junge *Cecilia glutinosa* mit Kiemenlöchern aus Malacca. Monatsber. Acad. Wiss. Berlin, 1864, May 12 (p. 303).
- BOCAGE, J. V. BARBOZA DU. Notice sur un Batracien nouveau du Portugal (*Chioglossa lusitanica*). Proc. Zool. Soc. 1864, June 14 (pp. 264-265, with a plate).
- PETERS, W. Ueber einige neue Amphibien. Monatsber. Acad. Wiss. Berlin, 1864, June 20 (pp. 384-391).
- GRAY, J. E. Note on *Sternotherus adansonii* from West Africa. Proc. Zool. Soc. 1864, June 28 (p. 296, with a plate).
- GÜNTHER, A. Report on a collection of Reptiles made by Dr. Kirk in the Zambesi and Nyassa Regions. Proc. Zool. Soc. 1864, June 28 (p. 303, with two plates).
- COPE, E. D. Contributions to the Herpetology of North America. Proc. Acad. Nat. Sc. Philad. 1864, August 30 (pp. 166-181).
- COPE, E. D. On the limits and relations of *Raniformes*. Proc. Acad. Nat. Sc. Philad. 1864, August 30 (pp. 181-183). Having reason to believe that the author has a more detailed paper on his osteological researches in print, we may defer a record of this until the publication of the other.

COPE, E. D. On the characters of the higher groups of *Reptilia squamata*, and especially of the *Diploglossa*. Proc. Acad. Nat. Sc. Philad. 1864, October (pp. 224-231).

GRAY, J. E. Notice of a new genus (*Silurana*) of Frogs from West Africa. Ann. & Mag. Nat. Hist. 1864, xiv. October (p. 315).

GRAY, J. E. Note on the Clawed Toads (*Dactylethra*) of Africa. Proc. Zool. Soc. 1864, November 8 (pp. 458-464, with woodcuts).

GRAY, J. E. Revision of the genera and species of *Chamæleonidæ*, with the description of some new species. Proc. Zool. Soc. 1864, November 8 (pp. 465-479, with woodcuts and two plates).

GÜNTHER, A. Descriptions of new species of Batrachians from West Africa. Proc. Zool. Soc. 1864, November 8 (pp. 479-482, with a plate).

GÜNTHER, A. Report on a collection of Reptiles and Fishes from Palestine. Proc. Zool. Soc. 1864, November 8 (pp. 488-493).

The British Museum received a most valuable collection made by the Rev. H. B. Tristram in Palestine. A list of the species of Reptiles and Fishes contained in it is given in the paper mentioned, and the new species are described, viz. two Tortoises, nineteen Saurians with two new species, sixteen Snakes with an undescribed genus, and only three Batrachians. The collection was made in the course of a few months; and therefore we may conclude that the class of Reptiles is well represented in Palestine. The small number of Batrachians may be accounted for, first, by their almost total absence in the arid parts of the country, and, secondly, by the hidden life which is peculiar to many species, and which enabled them to escape the observation of even such experienced collectors as Mr. Tristram and his companions.

PETERS, W. Ueber eine neue Art der Baumvipern. Monatsber. Acad. Wiss. Berlin, 1864, November 14 (pp. 642-645).

GÜNTHER, A. Description of a new species of *Eublepharis*. Ann. & Mag. Nat. Hist. 1864, xiv. December (p. 429).

EDELING, A. C. J. Recherches sur la faune erpétologique de Bornéo. Nederl. Tydschr. Dierk. 1864 (pp. 200-204).

EDELING, A. C. J. Description d'une nouvelle espèce du genre *Megalophrys*, *M. chysii*. Ibid. (pp. 205-206).

SUMICHRAST, F. Note on the habits of some Mexican Reptiles. Ann. & Mag. Nat. Hist. 1864, xiii. p. 497 (translated from

the Bibliothèque Universelle, 1864, Arch. des Sci. Phys. et Nat. p. 45).

DANA, J. D. Note on the position of Amphibians among the classes of Vertebrates. Amer. Journ. Sc. & Arts, 1864, March (pp. 184-186).

FATIO, V. Les Reptiles et Batraciens de la Haute-Engadine. Bibl. Univ. et Arch. Sc. Phys. et Nat. 1864, November (pp. 241-290).

The author enumerates the following species :—*Lacerta vivipara*, *Anguis fragilis*, *Pelias berus*, *Rana temporaria*, *Bufo vulgaris*, and *Triton alpestris* (= *T. igneus*). For the observations made by the author, we refer to the several species.

ERBER, J. Die Amphibien der österr. Monarchie. Verhandl. Zool.-bot. Gesellsch. Wien, 1864 (pp. 697-712).

[The Reptiles of Austria. With observations made on living specimens kept in confinement.]

The author enumerates 42 species, and mentions the localities where he obtained the specimens.

PARKER, W. K. On the sternal apparatus of Birds and other Vertebrata. Proc. Zool. Soc. 1864, June 28 (pp. 339-341).

We refer to this purely anatomical paper, because it contains some novel views regarding the nomenclature of the bones of the sternal apparatus and of the humeral arch in Reptiles.

MITCHELL, S. W., and MOREHOUSE, G. R. Researches upon the anatomy and physiology of Respiration in the Chelonia. Smithson. Contrib. Knowl. 1864 (pp. 42, with woodcuts).

DUMÉRIL, A., et JACQUART. Sur les muscles de la déglutition chez les Ophidiens. Compt. rend. Acad. Sc. Paris, 1864, August 22 (p. 381, abstract).

STRICKER, S. Untersuchungen über die Entwicklung des Kopfes der Batrachier. Rischert und Du Bois R., Archiv Anat. 1864, March (pp. 52-76, with a plate).

[Researches on the development of the head of Batrachians.]

HULKE, J. W. A contribution to the minute anatomy of the Retina of Amphibia and Reptiles. Proc. Roy. Soc. 1864, February 18 (p. 138, abstract).

HYRTL, J. Ueber Wirbelassimilation bei Amphibien. Sitzgsber. Acad. Wiss. Wien, 1864, vol. xxix. February (pp. 264-272, with a plate).

[On parts of the vertebral column of Reptiles, abnormally modified and assimilated to neighbouring vertebræ.]

HYRTL, J. Ueber die sogenannten Herzvenen der Batrachier.

Sitzgsber. Acad. Wiss. Wien, 1864, vol. 50, June (pp. 42-46; with a plate).

[On the so-called veins of the heart in Batrachians.]

GERVAIS, P. Cas de polymélie (membres surnuméraires) observés sur un Batracien du genre *Pelobates*, et sur une espèce du genre *Raie*. Compt. rend. Acad. Sc. Paris, 1864, ii. November 14 (pp. 800-803).

Polymely is that kind of monstrosity in which some part of one or more extremities is doubled.

Only three cases were known among Batrachians; in the case observed by M. Gervais, the left fore foot of a *Pelobates cultripes* is double. These cases are of some interest, as they occur in Vertebrates the larvæ of which are destitute of extremities, and therefore prove the incorrectness of the opinion that these monsters are the result of a fusion of two originally separate fœtuses. The other case, observed in a Ray, will be mentioned below.

EBERTH, C. J. Ueber die Milz- und Mesenterial-drüse des Crocodils. Würzb. ntrwiss. Zeitschr. 1864, v. pp. 41-42.

[On the spleen and mesenterial gland of the Crocodile.]

A statement made by Van der Hoeven (Philos. Zool. p. 330), that the number of species of Reptiles known is 1500, depends on antiquated data, and is much too low.

CHELONIA.

The British Museum has received from Dr. Bleeker the collection of typical specimens of the species of Reptiles named or described by him in the 'Natuurkundig Tydschrift for Nederlandsch Indie.' Dr. Gray (Proc. Zool. Soc. 1864, p. 11) has examined the tortoises, and refers the specimens to species previously known.

Fam. EMYDIDÆ. The following known species are figured by Günther, Rept. Brit. Ind.:—

Cuora amboinensis (Daud.), pl. 4. figs. A & B; *Pyxidea mouhotii* (Gray), pl. 4. fig. D; *Geoemyda grandis* (Gray), pl. 1, and pl. 2. figs. A & B; *Emys crassicolis* (Gray), pl. 4. fig. A; *Emys trijuga* (Schweigg.), pl. 2. fig. C; *Pangshura tentoria* (Gray), pl. 4. figs. C, C'; *Batagur baska* (Gray), pl. 3. figs. B, B'; *Batagur ellioti* (Gray), pl. 3. figs. A, A'; *Batagur affinis* (Cantor), pl. 3. figs. C, C'.

Dermatemys mawii (Bibr.). Dr. Gray (Proc. Zool. Soc. 1864, p. 125) has examined an entire animal, which he describes; he repeats a statement made in his 'Shield Reptiles,' p. 50, viz. that A. Duméril's *Emys berrardi* is identical with it, and that the figure given by that gentleman is inaccurate.

New species :—

Cuora flavomarginata (Gray), see Günther, Rept. Brit. Ind. p. 13, pl. 5. fig. A, from China.

Cyclemys oldhami (Gray), see Günther, l. c. p. 15, pl. 5. fig. B, from Mergui and Gamboja.

Pangshura flaviventer, Günther, l. c. p. 35; and *Pangshura smithii*, *ibid.* p. 36, from the Punjab.

Staurotypus salvinii, Gray, Proc. Zool. Soc. 1864, p. 127, from Guatemala. The author considers this species the type of a subgenus, *Stauremys*.

Fam. CHELYDIDÆ. Dr. Gray (Proc. Zool. Soc. 1864, p. 128) has examined skulls of several of the genera which he formerly referred to this family; the characters furnished by this study have induced him to modify considerably the arrangement of the genera given in the 'Shield Reptiles.'

The new arrangement is as follows :—

A. *Typical Chelydidae*. Head covered with soft skin. Skull depressed, without any or only a very rudimentary zygomatic arch. Temporal depression large, with a more or less wide bony arch at the back, from the ear-bones (?) to the middle of the occiput. Temporal muscles only covered with skin. Lower jaw weak, slender. The alveolar surface of the jaws thin, with a more or less distinct submarginal ridge.

a. *Chelydina*. Beak covered with flesh. Skull very depressed, abnormal; no central bony crown to the head; auri-occipital arch very slender, small: *Chelys* (Daud.), type *Ch. fimbriata*, Schneid.

b. *Hydraspidina*. Beak naked. Skull rather depressed, of normal form, with a distinct central bony crown and a more or less strong auri-occipital arch. Shell very depressed, thin.

To this division are referred: 1. *Hydraspis*, split into three subgenera: *Hydraspis* with the type *H. variceps* (skull figured), *Rhinemys* with the type *H. gibba*, *Phrynops* with the type *H. Geoffroyana*. 2. *Chelodina*. 3. *Platemys*. 4. *Chelymys*.

B. Head covered with hard horny plates. Zygomatic arch largely developed, often covering a part of the temporal muscle. Lower jaw strong. Nuchal and gular plate marginal.

a. Skull depressed; zygomatic arch moderately developed; temporal muscles covered with hard dermal shields. Alveolar surface of the jaws thin, with a small submarginal ridge. Claws 5-5. Africa: *Sternotherus* (divided into the subgenera *Tanoa* and *Notoa*) and *Pelomedusa*.

b. Head swollen; zygomatic arch much dilated posteriorly, so as to cover the temporal muscles with a bony case to the occiput. Alveolar surface of the jaws wide, callous, with several ridges. Claws 5-4. America.—To this division belong *Podocnemis*, from which *P. dumeriliana* (Wagl.) is separated as the type of a subgenus, *Chelonemys*; and *Peltecephalus*.

Sternotherus adansonii (Schweig.). Dr. J. E. Gray has received specimens

of this species from West Africa; he describes and figures it, referring it to the subgenus *Notoa*, Proc. Zool. Soc. 1864, p. 296, pl. 23.

Fam. TRIONYCHIDÆ. The following species are figured by Günther:—

Trionyx ornatus (Gray), pl. 6. fig. B; *Trionyx güntheri* (Gray), pl. 6. fig. A; *Chitra indica* (Gray), pl. 6. fig. C.

Dr. J. E. Gray has made a most valuable contribution to our knowledge of the African and Asiatic species of this family, Proc. Zool. Soc. 1864, p. 76. After referring to Agassiz's researches on the American species, and giving an outline of the history of the genera established, he states that he concurs with Agassiz's opinion, that great confidence is to be placed in characters furnished by the general form of the skull, and in the position and extent of the choanæ. The paper being accompanied with a series of woodcuts of the skulls examined, a glance at them will at once reveal striking differences between them; but it is another question whether those differences are of *generic* value. The best way to determine whether an osteological character is of generic value, is to find whether it is constantly accompanied by an external one, and *vice versa*; another way of determining its value, is to look whether it occurs in a whole series of species. Now, it would appear to the Recorder that the material at present available for examination has proved to be too little to enable one to do this, Dr. Gray considering (with one exception) every species the skull of which was examined by him, as the type of a distinct genus. The external similarity of these genera is so great, that no other character could be found to distinguish them, and consequently the author must leave it doubtful to which genera those species should be referred the skulls of which are unknown.

The principal divisions are the same as those proposed by the author in his 'Shield Reptiles,' p. 63.

A. The typical forms "with the head moderate, face conical, eyes lateral" (*Trionychina*) are subdivided thus:—

- a. Lower jaw (of adult) with a broad, flat alveolar disk; palate with a deep, wide concavity in front of the inner nostrils. To this group belong:—

Trionyx, Gray, p. 81; type *Trionyx gangeticus* (Cuv.).

Rafetus, Gray, p. 81; type *Testudo euphratica* (Daud.).

Dogania, Gray, p. 82; type *Dogania subplana* (Gray), with *Dogania güntheri* (Gray); skulls of both species examined, that of the first species figured.

Aspilus, Gray, p. 83; type *Trionyx cariniferus* (Gray); the skull of this species is figured; *Aspilus* (?) *punctulatus* (Gray) and *Trionyx ornatus*, Gray, are referred to this genus with doubt.

- b. Lower jaw with a simple sharp shelving edge in front, and a flat shelving alveolar disk on the hinder half.

- * Palate concave, with a narrow deep groove of equal width in front of the large internal nostrils, which have two very large grooves behind them, and which are contracted, and overlapped on the sides by the alveolar plates.

Potamochelys, Gray, p. 85; type *Trionyx javanicus* (Geoffr.); skull, figs. 7 & 8. *T. perocellatus* (Gray), *T. frenatus* (Gray), *T. tuberculatus* (Cant.), and *Potamochelys* (?) *microcephalus* appear to belong to this genus.

- ** Palate flat, with a broad shallow groove of equal width in front of the large posterior internal nostrils, which have two short deep grooves behind them.

Tyrse, Gray, p. 87; type *Trionyx ægyptiacus* (Schweigg.).

B. The typical forms with "the head elongate, face very short, eyes anterior" are subdivided thus:—

- a. Skull short and broad, much depressed; alveolar edge of both jaws flat, simple: *Pelochelys*, Gray, p. 89; type *P. cantorii* (Gray); skull, figs. 9 & 10. To this genus also belong *Pelochelys cumingii* (Gray) and *Trionyx bibronii* (Owen).
- b. Skull elongate; forehead shelving, much produced behind; nose very short, convex; alveolar edge of both jaws with a deep groove: *Chelonia*, Gray, p. 91; type *Gymnopus lineatus* (D. & B.); skull, figs. 11 & 12.

C. The "aberrant Mud-Tortoises" are now subdivided into three groups, each with one genus:—

- a. Skull short, depressed, flat above; palate flat, with scarcely any alveolar ridges, and only a very slight pit before and behind the internal nostrils: *Heptathya* (Cope), p. 93; type *Cycloclermus frenatum* (Peters); skull, figs. 13-15. *Aspidochelys livingstonii* (Gray) is perhaps identical with the former species.
- b. Skull oblong, swollen, convex above; palate concave, with large, distinct alveolar plates, and a deep central pit before and behind the internal nostrils. Margin of the dorsal disk without internal bones: *Cyclanosteus*, Gray, p. 94; type *Emyda senegalensis* (Gray); skull, figs. 16-21.
- c. The margin of the dorsal disk with internal bones; skull oblong, swollen, convex: *Emyda*, Gray, p. 97 type *Testudo granosa*, Schoepff.

Trionyx argus (Gray) proves to be identical with the North American *Trionyx spiniferus* (Lesueur); Gray, Proc. Zool. Soc. 1864, p. 89.

New species:—

Chitra indica. Dr. Gray (l. c. p. 89) shows that three species have been confounded under this name: one has the head short and is from Malacca; it is figured by Günther, as quoted above, and most probably identical with *Trionyx bibronii* (Owen); Gray names it *Pelochelys cantor*. The second, *Pelochelys cumingii*, from the Philippine Islands, also has a short head. The third, for which Gray retains the name *Chitra indica*, has a long head, and is from the Ganges.

* We do not see the reason why this name should be entirely suppressed.

Aspilus? punctulatus, Gray, Proc. Zool. Soc. 1864, p. 84, from Amboyna or Ceram. *Potamochelys (?) microcephalus*, Gray, l. c. p. 87, from Sarawak.

SAURIA.

Mr. E. D. Cope has taken up the study of the osteology of Reptiles with the intention of establishing a better base for a system of this class of animals. In the 'Proceedings of the Academy of Natural Sciences of Philadelphia,' 1864, p. 224, he gives an abstract from his manuscript, presenting some new views in this department. It would be scarcely possible to do justice to the contents of this paper without reproducing all the characters (chiefly osteological) on which the author bases the suborders, tribes, and families; and therefore we must refer to the paper itself. We hope that when the author publishes the manuscript, of which the present publication is a mere abstract, he will name the species and generic types which he has examined, as faith in his generalizations would be much strengthened by his thus showing the extent of his observations.

The system of Saurians, modified by Mr. Cope, would be the following:—

First Suborder. ACRODONTA.

Tribe A. RHIPTOGLOSSA, with the family of *Chamaeleonidae*.

Tribe B. PACHYGLOSSA, with the families of *Agamidae* and *Hatterüide*.

Second Suborder. PLEURODONTA.

Tribe A. IGUANIA, with the families of *Anolidæ* and *Iguanidæ*.

Tribe B. DIPLOGLOSSA, with the families of *Anguidæ*, *Gerrhonotidæ*, and *Helodermidæ*.—The *Anguidæ* are entirely reconstructed; he divides them into four subfamilies:

a. *Ophiosaurinæ*: *Dopasia*, *Pseudopus*, *Ophiosaurus*, and *Ophiotes*.

b. *Ophiomorinæ*: *Ophiomorus*.

c. *Anguinæ*: *Anguis*.

d. *Diploglossinæ*: *Onida*, *Panolopus*, *Sauresia*, *Diploglossus*, *Microlepis*, and *Camilia*.

Tribe C. THECAGLOSSA, with the family of *Varanidæ*.

Tribe D. LEPTOGLOSSA.

a. Premaxillary simple, with the families of *Teidæ*, *Lacertidæ*, *Chalcididæ*, and *Eublepidæ*.

β. Premaxillary double, with the families of *Scincidæ* and *Sepsidæ*.

Tribe E. TYPHLOPHthalmi, with the families of *Anelytropidæ*, *Acontiidæ*, and *Amiellidæ*.

Fam. CROCODILIDÆ. The following species are figured by Günther, Rept. Brit. Ind.:—

Crocodilus palustris (Less.), pl. 8. fig. A; *Crocodilus siamensis* (Schneid.), pl. 8. fig. B; *Crocodilus pondicerianus* (Gray), pl. 7.

Fam. VARANIDÆ. The heads of the following species are figured by Günther, Rept. Brit. Ind.:—

Varanus flavescens (Gray), pl. 9. figs. A, A'; *Varanus draconia* (L.), pl. 9. fig. B; *Varanus lunatus* (Gray), pl. 9. fig. C; *Varanus nebulosus* (Gray), pl. 9. fig. D; *Hydrosaurus salvator* (Laur.), pl. 9. fig. E.

Fam. HELODERMATIDÆ. *Heloderma horridum* (Wagl.). On its habits see Sumichrast, Ann. & Mag. Nat. Hist. 1864, xiii. p. 497.

Fam. LACERTIDÆ. Günther, Rept. Brit. Ind. pp. 69 & 70, describes the species of *Tachydromus*, two of which are considered as new: *T. meridionalis* and *T. septentrionalis*, both from China; all are figured on pl. 8.

Acanthodactylus cantoris, sp. n., Günther, p. 73, from Ramnuggar.

Teira ornata, sp. n., Gray, Proc. Zool. Soc. 1864, p. 58, from South-eastern Africa.

Zootoca tristrami, sp. n., Günther, Proc. Zool. Soc. 1864, p. 491, from the Lebanon.

Lacerta vivipara. M. Fatio gives a very lengthened description of the different varieties observed by him in the Upper Engadin, where it is rather local and not very abundant. He has several times had occasion to observe that this species takes to the water, and tries to escape capture by remaining at the bottom until the danger has passed. Females have the trunk comparatively longer than males. Bibl. Univ. 1864, p. 245.

Fam. ZONURIDÆ. Dr. Peters (Proc. Zool. Soc. 1864, p. 377) vindicates the correctness of the word *Cañua* as the vernacular name of *Gerrhosaurus robustus*, against the assertion made by Kirk in the same journal, p. 58, that some misapplication of that word had taken place.

Gerrhonotus gramineus, sp. n., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 179, from Mexico.

Fam. PYGODIDÆ. *Pletholax*, g. n., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 229. Posterior extremities; no præanal pores; scales with two keels and a groove between.—*P. gracilis*, from South-west Australia.

Fam. SCINCIDÆ. Dr. Peters disapproves of the artificial method practised in this family, of establishing genera and sub-genera on trivial characters which sometimes are subject to variation, so that specimens of the same species are referred to two different genera. Monatsber. Berl. Acad. 1864, p. 387.

Scincus meccensis (Hempr. & Ehrenb.), Wieg. Arch. Ntrgesch. iii. 1837, p. 127, has been reexamined by Peters, who considers it as a well-distinguished species. Monatsber. Berl. Acad. 1864, p. 44.

Pedorychus (Scincus) hemprichii (Wieg. Arch. Ntrgesch. iii. 1837, p. 128). Peters directs the attention of herpetologists to this species, which has not been mentioned by any of the later authors. Monatsber. Berl. Acad. 1864, p. 44.

Scincopus is the name of a lizard which is considered by Peters to be the type

of a subgenus of *Scincus*; it is characterized and distinguished from *Scincus* proper by having the nostril between two nasals; eyes large; external opening of the ear very wide, nearly hidden below two large scales. Scales striated, those on the back very large, larger than those on the belly.—*Sc. fasciatus*, from Oran (Algeria). Monatsber. Berl. Acad. 1864, p. 45.

Mochlus, g. n., Gunther, Proc. Zool. Soc. 1864, p. 308. Similar to *Scincus*; body and tail elongate; limbs feeble; toes 5-5. Snout depressed, wedge-shaped, the rostral shield having a sharpish anterior edge. A pair of supranasals; nostril in the middle of a separate shield. Scales smooth, eyelid scaly; opening of the ear small. Palate toothless.—*M. punctulatus*, from the Zambesi. Having lately received one of the typical specimens of *Eumeces afer*, Peters, we have convinced ourselves that *Mochlus* is identical with that species, shortly characterized in Wieg. Arch. 1855, p. 48.

Teratoscincus, g. n., Strauch, Bull. Acad. Sc. St. Pétersb. 1863, vi. p. 280. Caput tetragono-pyramidale, breve, crassum, cutē granulosa obtectum, capite Geckonis simillimum. Oculi magni, pupilla circulari; palpebra inferior nulla, superior brevissima, formam lobi crenulati præbens. Meatus auditorius magnus, sed angustus et oblique positus; membrana tympani profunde detrusa. Nares parvæ inter scutella quinque positæ. Lingua brevis, carnosæ, apice fissæ, squamulis planis minutissimis tectæ. Truncus medio dilatatus, subdepressus, ubique squamis magnis imbricatis obtectus; squamæ levæ, margine libero subrotundatæ vel paulum angulatæ. Pedes quatuor pentadactyli, squamati, excepta facie posteriori femorum et antibrachiorum granulata. Digiti inæquales, marginibus valde pectinati. Hypodactylia squamulis subspinosi. Pori nulli. Cauda longa, teres, squamata, supra in duabus tertiis partibus posterioribus scutis 12-14 magnis latis subfalcefornibus lorica.

Teratoscincus keyserlingii. Supra sordide griseo-albus, subtus albicans; capite nonnullis maculis irregularibus nigrescentibus, dorso utrinque vittis duabus nigris indistinctis et sæpe interruptis. Pallus differt dorso caudaque transverse nigrofasciatis. Longitudo totius animalis 15·8 ctm.; capitis 2·9 ctm.; caudæ, a margine posteriori cloacæ usque ad apicem 5·6 ctm. *Hab.* Seri-Tschah (Persia).

Mocoa. Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 180, "prefers using the more classic and prior name of *Lampropholis*" (Fitz.), although "the genus was first established by J. E. Gray, and is not to be attributed to Fitzinger." Consequently it should be called *Lampropholis*, Cope. The author also is of opinion that the American species placed by Gray in *Mocoa* belongs to the genus *Oligosoma* (Girard), under which *Lygosomella* (Girard), *Leptosoma* (Fitz.), and perhaps *Hombrovia* (Girard) may be placed as synonyms.

(*Mocoa*) *Lampropholis assatus*, n. sp., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 179, from Guatemala.

(*Mocoa*) *Oligosoma gemmingeri*, n. sp., Cope, l. c. p. 180, from Mexico.

Siaphos simplex, n. sp., Cope, l. c. p. 229, from Australia.

Rhodona punctata. Dr. Gray has received a lizard from the Swan River which he considers a variety of this species, Proc. Zool. Soc. 1864, p. 296.

The following known species have been figured by Günther, Rept. Brit. Ind. :—

Tropidophorus microlepis, Gthr., pl. 10. fig. A; *Euprepes rufescens*, Shaw, pl. 10. fig. B; *Euprepes olivaceus*, Gray, pl. 10. fig. D; *Mabouia quadrilineata*, Blyth, pl. 10. fig. E; *Mabouia chinensis*, Gray, pl. 10. fig. F; *Eumeces reevesii*, Gray, pl. 10. fig. K; *Eumeces taprobanensis*, Kelaart, pl. 13. fig. B.

Prof. Peters, Monatsber. Acad. Wiss. Berlin, 1864, has reexamined the typical specimens of Scincoids described by Wiegmann, and other species contained in the Berlin Museum. Besides those mentioned above, the following deserve particular attention :—

1. *Heteropus* (Fitz.). He shows that Fitzinger applied this name first to *Sphenops capistratus* (Wagl.), and afterwards to *Heteropus fuscus* (D. & B.). He adds the remark that the inner finger of *Sphenops capistratus* is not rarely absent, p. 47.

2. *Camilia jamaicensis* (Gray) identical with *Diploglossus monotropis* (Wiegmann), p. 48.

3. *Eumeces* (Wiegmann). The typical and only species of this genus known to Wiegmann is *Scincus parimentatus* (Geoffr.) = *Plestiodon aldrovandi* (D. & B.); therefore Duméril and Bibron have misapplied this name, p. 48.

4. *Euprepes lynce* (Wiegmann) has been erroneously referred to *E. quinquelineatus* (Gm.) by Duméril and Bibron, and belongs to *Eumeces* (Wiegmann.), p. 49.

5. *Eumeces oppelii* (D. & B.) identical with *Euprepis rufescens* (Wiegmann.), p. 49.

6. *Euprepis* (*Scincus*) *carinatus* (Schneid.) is identical with, and prior to, *E. sebæ* (D. & B.) = *E. rufescens* (Shaw), p. 50.

7. *Euprepes spilonotus* (Wiegmann) differs scarcely from *Eumeces sloanei* (Daud.), p. 50.

8. *Euprepes semitaniatus*, *E. pyrrhocephalus*, and *E. brevicollis* of Wiegmann are good species, p. 50.

9. *Euprepes smithii* (Gray) is identical with *E. homalocephalus* (Wiegmann). Isis, 1828, p. 374, p. 51.

10. *Euprepes* (*Scincus*) *auratus* (Schneid.) is a compound. The species for which Wiegmann has retained this name has the scales sometimes smooth, sometimes striated, p. 51.

11. *Eumeces quinquelineatus* (D. & B.). Prof. Peters is of opinion that the Japanese specimens are different from those of North America, p. 57. Günther (Rept. Brit. Ind. p. 84) shows that specimens from Japan and North America are more nearly allied to each other than to those from China.

New species :—

Euprepes monticola, Günther, Rept. Brit. Ind. p. 80, pl. 10. fig. C; *Eumeces himalayanus*, Günther, p. 86, pl. 10. fig. II, from the Himalayas and Kashmir; *Eumeces modestus*, Günther, p. 87, pl. 10. fig. G, from Ningpo; *Eumeces ladaensis*, Günther, p. 88, pl. 10. fig. I, from Tibet; *Eumeces siamensis*, Günther, p. 91, from Siam; *Eumeces bowringii*, ibid., from Hongkong; *Eumeces isodactylus*, Günther, p. 93, pl. 13. fig. A, from Gamboja.

Euprepes libanoticus, Peters, Monatsber. Berl. Acad. 1864, p. 51; *Euprepes ceneo-fuscus*, Peters, ibid. p. 52, perhaps from West Africa; *Euprepes pleurostictus*, Peters, ibid., from Guinea; *Euprepes (Mabuya) biteniatus*, Peters, ibid. p. 53, from Luzon and Samar.

Lygosoma (Hinulia) jagorii, Peters, Monatsber. Berl. Acad. 1864, p. 54, from the Philippine Islands; *Lygosoma (Hin.) acutum*, Peters, ibid., from the island of Samar.

Gray, Proc. Zool. Soc. 1864, describes three new species of *Euprepis* from South-eastern Africa, viz. *E. gularis*, p. 61; *E. kirkii*, p. 62, pl. 9. fig. 1; *E. grantii*, p. 62.

Apterygodon vittatum, subg. and sp. n., Edeling, Nederl. Tydschr. Dierk. 1864, p. 201, appears to be a species of *Euprepes*, from Borneo.

Heteropus schlegelii, Peters, Monatsber. Berl. Acad. 1864, p. 57, from Timor and Amboyna.

Diploglossus steindachneri, Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 179, from Mexico.

Fam. SEPSIDÆ. *Seps monodactylus*, sp. n., Günther, Proc. Zool. Soc. 1864, p. 491, from Palestine.

Fam. ACONTIADIDÆ. *Typhloscincus*, g. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 271, agrees with *Dibamus*, but is without rudiments of limbs. *T. martensii*, fig. 1, from Ternate.

Fam. GECKOTIDÆ. The following known species have been figured by Günther, Rept. Brit. Ind. :—

Gecko stentor (Cantor), pl. 11. fig. A; *Eublepharis hardwickii* (Gray), pl. 11. fig. B.

Nycteridium is a new name proposed by Günther, p. 111, for the genus *Platyrus*, Gray, which is preoccupied.

Dr. Gray has examined the *Stenodactylus caudicinctus* (A. Dum.), and has found that it does not belong to that genus, having the lower surface of the toes finely granulated, and not provided with denticulated cross plates; he considers it to be the type of a new genus, *Psilodactylus*, which has a striking similarity with *Eublepharis*, but differs from it in the tubercles of the back being formed by groups of three scales. Proc. Zool. Soc. 1864, pp. 60, 61.

Spatahura carteri. Mr. Carter describes the colours of this lizard, Proc. Zool. Soc. 1864, p. 135; it had been described in the same journal, 1863, p. 236.

New species and genera :—

Gecko swinhonis, Günther, Rept. Brit. Ind. p. 104, pl. 12. fig. A, from northern China; *Gecko subpalmatus*, ibid. fig. B, from Chikiang.

Hemidactylus sykesii, Günther, l. c. p. 108, pl. 12. fig. C, from the Deccan.

Peripia cantoris, Günther, l. c. p. 110, from Pinang, previously erroneously named by Cantor *Platydaetylus lugubris*, D. & B.

Gymnodactylus triedrus, Günther, l. c. p. 113, from Ceylon; *Gymnodactylus frenatus*, ibid. pl. 12. fig. D, from Ceylon; *Gymnodactylus dekkkanensis*, Günther, p. 115, pl. 12. fig. E, from the Dekkan.

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Pentadactylus borneensis, Günther, *l. c.* p. 117, from Borneo; *Pentadactylus felinus*, Günther, *ibid.* pl. 12. figs. F, F', from Singapore.

Lygodactylus, Gray, Proc. Zool. Soc. 1864, p. 59, is a new genus closely allied to *Thecadactylus*, from which it differs by having the toes freer, and the bases of the toes slender and subcylindrical. *L. strigatus*, from South-eastern Africa.

Homodactylus, g. n., Gray, Proc. Zool. Soc. 1864, p. 59. Toes free, broad, depressed, rather broader and rounded at the ends; thumb broad like the toes, all with a single series of broad transverse plates beneath the dilated end, and without any free compressed terminal joints or claws. Back with large tubercles; preanal or femoral pores none. *H. turneri*, pl. 9. fig. 2, from South-eastern Africa.

Eublepharis fasciolatus, Günther, Ann. & Mag. Nat. Hist. 1864, xiv. p. 429, from Hyderabad, Sindh.

Fam. IGUANIDÆ. Prof. Sumichrast gives his observations on the habits of the *Iguana*, especially of *Cyclura acanthura*, and of *Basiliscus vittatus*, *Corythophanes chamaeleopsis*, and *Phrynosoma orbiculare*; Ann. & Mag. Nat. Hist. 1864, xiii. p. 500.

Mr. Cope states that *Uta bicarinata*, the type of Duméril's genus *Phymatolepis*, cannot be separated from *Uta*, and that *Sauromalus* (Duméril) is identical with *Euphryne* (Baird); Proc. Acad. Nat. Sc. Philad. 1864, p. 177.

New species :—

Mr. Cope obtained permission to examine the specimens of *Anolis* in the British Museum, collected since the publication of Dr. Gray's 'Catalogue of Lizards;' he found a number of species which he considers as new, and describes them with several others in Proc. Acad. Nat. Sc. Philad. 1864 :—

Chamaeleolis porcus, p. 168, from Cuba; *Eupristis baleatus*, p. 168, from S. Domingo; *Xiphosurus ferreus*, p. 168, from Guadaloupe; *Xiphosurus homolechis*, p. 169, from the West Indies; *Anolis damulus*, p. 169, from Guatemala; *A. gingivinus*, p. 170, from Anguilla Rock; *A. citrinellus*, p. 170, from Hayti; *A. carneus*, p. 171, from Lower Vera Paz; *A. semilineatus*, p. 171, from Hayti; *A. bitectus*, p. 171, from Western Ecuador; *A. scypheus*, p. 172; *A. ustus*, p. 172, from Belize; *A. heliactin*, p. 172, from Mexico; *A. nanmodes*, p. 173, from Coban and Mexico; *A. crassulus*, p. 173, from Vera Paz; *A. cymbops*, p. 173, from Vera Cruz; *A. impetigosus*, p. 174; *A. gibbiceps*, p. 174, from Caraccas; *A. ordinatus*, p. 175, from the West Indies; *A. alliaceus*, p. 175.

Lamantcus serratus, Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 176, from Mexico.

Uta nigricauda, Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 176, from Lower California.

Sceloporus. Cope, Proc. Acad. Nat. Sc. Philad. 1864, describes four new species from Central America :—*S. utiformis*, p. 177; *S. pyrocephalus*, p. 177; *S. oligoporus*, p. 177; *S. malachiticus*, p. 178.

Phrynosoma asio, Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 178, from Mexico.

Fam. AGAMIDÆ. The following known species have been figured by Günther, Rept. Brit. Ind. :—

Ceratophora stoddartii (Gray), pl. 13. figs. F, F', F''; *Cophotis ceylanica* (Peters), pl. 13. fig. H; *Calotes nigrilabris* (Peters), pl. 14. figs. D, D'; *Acanthosaura capra* (Gthr.), pl. 14. fig. F; *Acanthosaura coronata* (Gthr.), pl. 14. fig. E; *Physignathus mentager* (Gthr.), pl. 15.

Dr. Günther, *l. c.*, gives descriptions of all the species of *Draco* known, fourteen in number; he adds the following new ones :—

D. reticulatus, p. 125, and *D. bimaculatus*, p. 127, from the Philippine Islands; *D. cornutus*, p. 125, from Borneo; *D. rostratus*, p. 127, probably from the same island.—*D. maculatus*, Gray, *D. dussumieri*, D. & B., and *D. tenuipterus*, Gthr., are figured on plate 13.

Dr. Günther states (p. 139) that *Calotes* and *Bronchocela* are two geographically very distinct genera, the former being found on the continent of India only, whilst the latter is almost entirely confined to the archipelago; both genera, however, intermingle with each other in Siam.

Mecolepis, Duméril, with the three species established by that author, has proved to be identical with *Salea*, Gray: see Günther, p. 145.

New species and genera :—

Centrotrachelus, g. n., Strauch, Bull. Acad. Sc. St. Pétersb. 1863, vi. p. 479. Caput subtriangulare, breve, crassum, convexum, rostro rotundato, squamis tuberculosis, irregularibus, in fronte majoribus et convexioribus, contextum. Regio gularis subtiliter granulata. Orbitæ simplices; nares parvæ, sub cautho rostrali positæ, retrorsum directæ. Aures magnæ, verticales, oblongæ, partim plicis collaribus occultæ; membrana tympani altius detrusa. Occiput, nucha, regio postauricularis et collum scutis magnis, multangularibus, in spina valida elevatis, series transversas fingentibus, ornantur. Truncus elongatus, depressus; squamæ dorsi læves, imbricatæ, inæquales; aliæ parvæ, aliæ quadruplo majores, subtectiformes per series transversas dispositæ; squamæ pectorales abdominalesque læves, imbricatæ. Antepectus plicæ transversæ. Membra valida, squamata, supra nonnullis spinis dispersis; pedes pentadactyli, digitis inæqualibus, unguiculatis. Pori anales nulli, femorales utrinque undecim. Cauda longa, lata, verticillata, crassa, subtus plana et inermis, supra tectiformis et spinosa; verticilli singuli supra squamis plerumque octo magnis, multangulis, in spina conica, plus minusve acuminata elevatis, apicem versus diminuentibus instructi.

Centrotrachelus asmusi. Capite ex olivaceo griseo, obscuro, dorso sordide viridescenti-flavo, cauda membrisque olivaceis; pectore fusco; abdomine, palmis plantisque flavis, primo sparsim nigromaculato. Longitudo totius animalis 43·6 ctm.; capitis 4·6 ctm.; caudæ 19·9 ctm. *Hab.* Seri-Tschah (Persia).

Ceratophora aspera, Günther, *l. c.* p. 131, pl. 13. figs. G, G', is a highly interesting species of this genus, of which it is the dwarf form; like its congeners, it is from Ceylon.

Japalura swinhonis, Günther, *l. c.* p. 133, pl. 14. fig. B from Formosa.—

According to the same author, *Japalura* (Gray), *Biancia* (Gray), and *Diplo-derma* (Hallow.) are identical.

Otocryptis (*Japalura*) *nigrilabris*, Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 385, from Borneo; *Otocryptis fusca*, Peters, ibid., from Malacca; *Otocryptis gularis*, Peters, ibid. p. 386, from Calcutta. The author regards *Japalura* (Gray) as a subgenus of *Otocryptis*, and the two last-named species as types of two other subgenera, for which he proposes the names of *Aphaniotis* and *Ptyctolemus*.

Sitana minor, Günther, l. c. p. 135. pl. 14, fig. A, from Madras.

Bronchocela smaragdina, Günther, l. c. p. 138, from Gamboja.

Trapelus megalonyx, Günther, l. c. p. 159, pl. 14, fig. C, probably from Afghanistan.

Orioculotes is a new genus, established by Günther, l. c. p. 146, for *Calotes minor*, Gray, and distinguished from *Calotes* by having larger scales scattered between the others; it has a spine behind the orbit, and the subcaudals are as broad as long.

Oriotiaris is a new genus, established by Günther, l. c. p. 150, for the species which he formerly described as *Tiaris ellioti*; it has no femoral pores, and a distinct tympanum, and is distinguished from the other allied Agamoid genera by having very small scales on the sides, but unequal in size; a tubercle behind the orbit; subcaudal scales as broad as long; males without gular sac.

Barycephalus sykesii, Günther, has now been recognized by him as *Stellio tuberculatus*, Gray (Günther, Rept. Brit. Ind. p. 157).

Fam. CHAMELEONIDÆ. Dr. Gray gives a synopsis of all the species of this family, twenty-eight in number, and referred to fourteen genera. All are characterized by a diagnosis, and the heads of several are figured. The author divides them as follows:—

1. *Chamæleo*.
 - a. *Calyptosaura*; type *Ch. calyptratus* (Dum.).
 - b. *Chamæleo*; type *Ch. vulgaris*; the second species of this subgenus is new, viz. *Ch. auratus*, p. 469, from Arabia.
 - c. —; type *Ch. petersii*, n. sp., p. 470, from Eastern Africa, with a woodcut.
 - d. —; type *Ch. monachus*, n. sp., p. 470. pl. 31, identical with *Ch. cucullatus* of A. Duméril, but not of Gray.
 - e. *Erizia*; type *Ch. senegalensis*.
 - f. *Dilepis*; type *Ch. dilepis* (Leach).
2. *Apola*; type *Ch. lateralis* (Gray), with a woodcut.
3. *Pterosaurus*; type *Ch. cristatus* (Gray).
4. *Microsaura*; type *M. melanocephala*, n. sp., p. 474, from Natal, with a woodcut.
5. *Phumanola*; type *Ch. namaquensis* (Smith).
6. *Lophosaura*.
 - a. *Lophosaura*; type *Ch. pumilus*; the second species is *Ch. ventralis* (Gray), the head of which is figured, p. 475.
 - b. *Archaius*; type *Ch. tigris*.
7. *Calumma*; type *Ch. cucullatus*; head figured on p. 476.

8. *Brookesia*; type *Ch. superciliaris* (Kuhl).
9. *Triceras*; type *Ch. owenii*.
10. *Crassonota*; type *Ch. nasutus*.
11. *Ensirostris*; type *E. melleri*, n. sp., p. 478, pl. 32, from Eastern Africa.
12. *Sauroceras*; type *Ch. rhinocerotus*.
13. *Dicranosaura*; type *Ch. bifurcus*.
14. *Cyneosaura*; type *Ch. pardalis*.

OPHIDIA.

Mr. E. D. Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 230, proposes the following division of this order:—

I. *Scolecophidia*.

II. *Catodonta*.

III. *Tortricina*.

1. *Tortricidæ*. 2. *Uropeltidæ*. 3. (—?).

IV. *Asinea*.

1. *Xenopeltidæ*. 2. *Pythonidæ*. 3. *Boidæ*. 4. *Acrochordidæ*.

V. *Proteroglypha*.

1. *Elapidæ*. 2. *Najidæ*. 3. *Hydrophidæ*.

VI. *Solenoglypha*.

1. *Atractaspidæ*. 2. *Causidæ*. 3. *Viperidæ*. 4. *Crotalidæ*.

Fam. *TYPHLOPIDÆ*. The first part of M. Jan's 'Iconographie' contains a descriptive synopsis of sixty-three species known to him, all of which are figured in part i. pls. 5 & 6, part ii. pls. 5 & 6, part iii. pls. 4, 5 & 6, and part iv. pls. 4, 5 & 6. The two plates of part i. have been critically examined by Peters (Wiegman. Arch. 1861, p. 35), who proves that the figures of *Stenostoma bicolor*, pl. 5. f. 15, *Typhlops preissii*, pl. 5. f. 2, *Anomalepis mexicanus*, pl. 6. f. 1, *Typhlops bianconii*, pl. 6. f. 3, *Typhlops flavoterminalis*, pl. 6. f. 10, are incorrectly drawn.

Typhlina, *Diaphorotyphlops* (!), *Typhlops*, *Ophthalmidion*, and *Onychocephalus* are considered by Jan as subgeneric divisions of *Typhlops*.

Günther, Rept. Brit. Ind., has figured on pl. 16 the following known species of Indian *Typhlopidae*:—

Typhlina lineata (Boie), fig. B; *Typhlops nigroalbus* (D. & B.), fig. F; *Typhlops horsfieldii* (Gray), figs. E, E'; *Typhlops braminus* (Daud.), fig. I; *Typhlops mirus* (Jan), fig. II; *Onychocephalus acutus* (D. & B.), fig. A.

Günther, l. c., has identified *Typhlops russellii* (Gray) and *Onychocephalus westermanni* (Lütken) with *Onychocephalus acutus* (D. & B.), which has the priority.

New genera and species:—

Anomalepis, g. n., Jan, l. c. p. 6. Teeth in the upper jaw only; ocular plate not entering the labial margin; head shielded above; two upper labials: *A. mexicanus*.

The following new species of *Typhlops* are described and figured by Jan:—

Diaphorotyphlops disparilis, Jan, p. 8, *Hab.* —?; *Diaphorotyphlops mirus*, Jan, p. 9, from Ceylon; *Typhlops cæcatus*, Jan, p. 9, from the Gold Coast; *Typhlops exiguus*, Jan, p. 9, from the East Indies; *Typhlops tenuis*, Jan, p. 10, *Hab.* —? (this name is to be altered, as it is preoccupied by an American species described by Salvin). *Typhlops riippelli*, Jan, p. 14, from Sydney; *Typhlops temminckii*, Jan, p. 14, *Hab.* —?; *Typhlops syriacus*, Jan, p. 15, from Beyrut; *Typhlops preissi*, Jan, p. 16, from South-western Australia; *Typhlops accedens*, Jan, p. 16, from the East Indies; *Typhlops schneideri*, Jan, from Bangkok; this species needs comparison with *T. horsfieldii*, Gray; the description is insufficient, and the figure is promised in part ix.; *Typhlops dichromatus*, Jan, p. 21, from the Island of Rhodes.

Günther, l. c., describes the following new species of this genus:—

Typhlops bothriorhynchus, p. 174, pl. 16. fig. G, from Pinang; *Typhlops siamensis*, p. 175, pl. 16. fig. D, from Siam. *Typhlops pammecees*, pl. 16. fig. C; this species had been named *T. tenuis* in the text (p. 176); but this name was subsequently changed, because it is preoccupied.

Typhlops flaviventer, Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 271, from Ternate.

Onychocephalus (Ophthalmidion) tenuicollis, Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 272, fig. 2, is said to be from the Himalayas.

Ophthalmidion bianconii, Jan, p. 23, *Hab.* —?; *Ophthalmidion lineolatus*, Jan, p. 24, from Sierra Leone; *Ophthalmidion kraussi*, Jan, p. 26, from the Gold Coast; *Onychocephalus smithi*, Jan, p. 27, from the Cape of Good Hope; *Onychocephalus hallowelli*, Jan, p. 29, from the Gold Coast; *Onychocephalus excipiens*, Jan, p. 30, needs comparison with *O. acutus* (D. & B.); the figure will be given in part ix.

Stenostoma signatum, Jan, p. 36, *Hab.* —?; *Stenostoma dimidiatum*, Jan, p. 36, from Brazil; *Stenostoma fitzingeri*, Jan, p. 37, from the Island of Rhodes; *Stenostoma (Catodon) macrorhynchum*, Jan, p. 39, from the Sennaar; *Stenostoma bicolor*, Jan, p. 40, from Boutry; *Stenostoma sundewalli*, Jan, p. 40, from West Africa.

Fam. UROPELTIDÆ. This family has received many additions through the zeal of Capt. Beddome, and appears to be represented by a great variety of forms; it is evident that many more discoveries are to be made, as these small Ophidiæ easily escape observation, living nearly always below ground. The question whether or not some species are found in the Philippine Islands may now be considered as settled; they are entirely confined to Ceylon and the peninsula of India.

Günther, Rept. Brit. Ind., figures on pl. 17 the following known species:—

Rhinophis sanguineus (Beddome), fig. A; *Rhinophis pulneyensis* (Beddome), fig. C; *Silybura macrolepis* (Peters), fig. B; *Silybura beddomii* (Gthr.), fig. F; *Silybura ocellata* (Beddome), figs. E, E'; *Silybura shortii* (Beddome), fig. G; *Silybura brevis* (Gthr.), fig. D.

Günther (p. 185) considers the *Rhinophis planiceps*, Peters, as not specifically distinct from *Rh. philippinus*, Cuv.

Melanophidium is a new genus, established by Günther, p. 193, for *Plectrus wynandensis*, Beddome; it is intermediate between this family and that of *Calamariidæ*, having the tail but slightly compressed, covered with smooth scales, and terminating in a very small, smooth, horny point. There is also a median groove along the chin. The species is figured on pl. 17. figs. I, I'.

Silybura bicatenata, n. sp., Günther, p. 191, pl. 17. figs. H, H', from the Dekkan.

Fam: CALAMARIDÆ. The following known species have been figured by Günther, Rept. Brit. Ind. :—

Geophis microcephalus (Gthr.), pl. 18. fig. A; *Aspidura trachyprocta* (Cope), pl. 18. figs. F, F'; *Haplocercus ceylonensis* (Gthr.), pl. 18. fig. G.

Aspidura carinata, Jan, is referred by Günther, p. 204, as a synonym to *Haplocercus ceylonensis*.

New genera :—

Macrocalamus, Günther, p. 198, with the subcaudals bifid, only one pair of frontals and eight upper labial shields; dentition as in *Calamaria*. The only species known is *M. lateralis*, p. 199, pl. 18. fig. D.

Oxyulamus has been established by Günther, p. 199, for *Calamaria longiceps*, Cantor. It is an isodont Calamaroid, with two pairs of frontal shields, with a præocular, and with the loreal replaced by the posterior frontal.

Rhynchocalamus, g. n., Günther, Proc. Zool. Soc. 1864, p. 491. Body rather elongate, cylindrical; rostral shield enlarged, not keeled, produced backwards; two pairs of frontals. Maxillary teeth few in number, subequal in size; the posterior broad at the base, with an impression, but without longitudinal groove; palatine teeth none. *Rh. melanocephalus*, from Palestine.

New species :—

Calamaria siamensis, Günther, Rept. Brit. Ind. p. 196, pl. 18. fig. B, from Siam and Laos; *Calamaria nigroalba*, Günther, p. 198, pl. 18. fig. C, from Pinang.

Edeling, Nederl. Tydschr. Dierk. 1864, describes two new species from Borneo: *Calamaria benjaminsii*, p. 202, and *Calamaria martapurensis*, p. 203.

Aspidura copii, Günther, l. c. p. 203, pl. 18. fig. E, probably from Ceylon.

Fam. OLIGODONTIDÆ. This family, founded by Günther, Rept. Brit. Ind. p. 205, comprises the two genera *Oligodon* and *Simotes*; for its characters we refer to the work itself.

Figures of the following known species have been given by Günther :—

Oligodon subgriseus, D. & B., pl. 19. fig. F; *Oligodon affinis*, Gthr., pl. 19. figs. B, B'; *Oligodon templetonii*, Gthr., pl. 19. fig. C; *Oligodon brevicauda*, Gthr., pl. 19. fig. A; *Simotes tenuatus*, Gthr., pl. 20. fig. A.

New species of *Oligodon*:—*O. spilonotus*, Gthr., p. 207, pl. 19. figs. E, E', from Madras; *O. ellioti*, Gthr., p. 207, pl. 19. fig. G, from Madras; *O. fasciatus*, Gthr., p. 208, pl. 19. figs. D, D', from the Deccan; *O. modestus*, Gthr., p. 210. *Hab.*—?

New species of *Simotes*:—*S. albirenter*, Gthr., p. 214, pl. 20. fig. D, from Ceylon; *S. signatus*, Gthr., p. 215, pl. 20. figs. F, F', from Singapore; *S. cine-*

reus, Gthr., p. 215, from Gamboja; *S. swinhonis*, Gthr., p. 215, pl. 20. fig. E. from Amoy; *S. bicatenatus*, Gthr., p. 217, *Hab.* — ?; *S. fasciolatus*, Gthr., p. 218, pl. 20. fig. B, from Pachebone; *S. cochinchinensis*, Gthr., p. 219, from the Laos Mountains.

Fam. COLUBRIDÆ. Dr. Günther, who, in his 'Colubrine Snakes,' distinguished the *Coronellidæ*, *Colubridæ*, *Dryadidæ*, and *Natricidæ* as separate families, unites them now into one family, *Colubridæ*, but admits them as groups, which, however, gradually pass into each other; Rept. Brit. Ind. p. 220.

Figures of species previously known :—

Salvadora grahamii and *Salvadora bairdii* (Jan) are figured by Jan, *l. c.* part i. pl. 3. Dr. Günther considers the latter as an individual variety of the former (*Ann. & Mag. Nat. Hist.* 1863, Nov. p. 349).

The following species have been figured by Günther, Rept. Brit. Ind. :—

Cyclophis major (Gthr.), pl. 17. fig. L; *Cyclophis frænatus* (Gthr.), pl. 19. fig. I; *Cyclophis calamaria* (Gthr.), pl. 17. fig. K; *Coluber rufodorsatus* (Cant.), pl. 20. fig. G; *Coluber mandarinus* (Cant.), fig. II; *Coluber porphyraceus* (Cant.), fig. I; *Elaphis sauromates* (Pall.), pl. 21. fig. E; *Compsosoma reticulare* (Cant.), pl. 21. fig. D; *Cymophis malabaricus* (Jerdon), pl. 21. fig. A; *Ptyas korros* (Reinw.), p. 164; *Zamenis diadema* (Schleg.), pl. 21. fig. G; *Zamenis gracilis* (Gthr.), pl. 21. fig. H; *Zamenis fasciolatus*, Shaw, pl. 21. fig. F; *Zaocys dhumnades* (Cant.) and *Z. nigromarginatus* (Blyth), pl. 21. figs. A. & B; *Tropidonotus macrophthalmus* (Gthr.), pl. 22. fig. C; *Tropidonotus platyceps* (Blyth), pl. 22. fig. D; *Tropidonotus junceus* (Cant.), pl. 22. fig. F.

Remarks on species and genera known :—

Ablabes. Dr. Günther has recognized *Calamaria coronella* (Schleg.), and refers it to *Ablabes*, so that his former determination of this species (*Colubr. Snak.* p. 6) proves to be erroneous. He adds that *Homalosoma coronelloides* (Jan) is only an accidental variety of this species, and that *Eirenis rothii* (Jan) is not specifically distinct from *Ablabes modestus* (Martin); *Proc. Zool. Soc.* 1864, p. 489.

Enicognathus (D. & B.) and *Trachischium* (Gthr.) are referred by Günther to *Ablabes*, Rept. Brit. Ind. p. 223.

Ablabes sagittarius, Cantor, has lately received a new name by Jan, viz. *Enicognathus grayi*: see Günther, *l. c.* p. 227.

Cantor's *Hurriah sanguiventer* (*Proc. Zool. Soc.* 1839, p. 52) has not yet been rediscovered, but Dr. Günther has found a drawing of the head of this snake in the British Museum, which is reproduced by him, Rept. Brit. Ind. p. 222.

The genus *Hydrophobus* (Gthr.) proves to have been founded on a species of *Odontomus*: see Günther, *l. c.* p. 234.

Heterodon histrius (Jan). Dr. Steindachner describes and figures a snake which he considers to be a variety of this species. *Verhandl. zool. bot. Gesellsch. Wien*, 1864, p. 232, tab. 6.

New genera and species :—

Prof. Reinhardt, Overs. Vid. Selsk. Förhandl. Kjöbenh. (1863, December), has discovered a very interesting new genus of snakes, which is provided with an apparatus of gular teeth similar to that of the African *Dasypeltis*. He names it *Elachistodon*, the teeth in the jaws and on the palate being minute and few in number. The maxillary has one or two small grooved teeth behind. Scales smooth, in fifteen series, those of the vertebral series being enlarged, hexagonal. Two nasals; loreal oblong, entering the orbit; one præorbital.—*Elachistodon westermanni*, from Rungpore; the head and the dentition are figured. Reinhardt refers this snake to the *Dasypeltidae*, whilst Günther (Rept. Brit. Ind. p. 444) would prefer to place it as the type of a distinct group in the family of *Colubridæ*.

Nymphophidium is a new genus proposed by Günther, Rept. Brit. Ind. p. 235; it is allied to *Odontomus*, from which it differs in the dentition, the three posterior maxillary teeth being very strong and trenchant; it has conical prominences on the base of the skull, reminding us of the vertebral teeth of *Dasypeltis* and *Elachistodon*.—*N. maculatum*, pl. 19. fig. II.—The Recorder may add that he has lately received a second example from the East Indian Archipelago.

Toluca frontalis, Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 167, from Mexico.

Cyclophis nasalis, Günther, Rept. Brit. Ind. p. 231, pl. 17. fig. M.—East Indies.

Odontomus gracilis, Günther, l. c. p. 234, from the Anamallay Mountains.

Coronella orientalis, Günther, l. c. p. 236, from the Dekkan.

Coronella nototania, Günther, Proc. Zool. Soc. 1864, p. 309, pl. 26, fig. 1, from the Zambesi.

Xenelaphis, g. n., founded by Günther, Rept. Brit. Ind. p. 250, on *Coluber hexahonotus*, Cant.; it is characterized by smooth scales, in seventeen series, those of the vertebral series being enlarged and six-sided.

Günther, l. c. p. 256, gives diagnoses of the four species of *Zaocys* (Cope), and proposes the subgeneric names of *Zapyrus* and *Zaocys*.

Dromicus clavatus, Peters, Monatsber. Berl. Acad. 1864, p. 388, from Mexico.

Tomodon nasutus, Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 166, from Mexico.

Xenodon angustirostris, Peters, Monatsber. Berl. Acad. 1864, p. 390, from Veragua.

The following new species of *Tropidonotus* have been described by Günther, Rept. Brit. Ind. :—

Trop. dorsalis, p. 263, from Chikiang; *Trop. himalayanus*, p. 265, pl. 22. fig. II, from Sikkim; *Trop. monticola* (? Jerdon), p. 267, from the peninsula of India; *Trop. ceylonensis*, p. 268, pl. 22. fig. G; *Trop. beddomii*, p. 269, pl. 22. fig. E, from the Nilgherries; *Trop. leucomelas*, p. 271, pl. 22. fig. I. (The British Museum has lately received several other examples of this species from Borneo.)

Tropidonotus melanogaster (Wiegman), Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 389, from Mexico.

Edeling, Nederl. Tydschr. Dierk. 1864, describes two new species from Borneo :—

Tropidonotus maculatus, p. 203, and *Amphiesma rufo-torquatum*, p. 204; the latter appears to be closely allied to *Tropidonotus leucomelas* (Gthr.).

Xenochrophis, g. n., proposed by Günther, Rept. Brit. Ind. p. 273, for *Tropidonotus cerasogaster* (Cant.); it is distinguished from *Tropidonotus* and other allied genera by having the nasal shield undivided, and an almost isodont dentition, the teeth being widely set, those in the middle of the maxillary series and those in front of the mandible being rather larger than the others.

Fam. HOMALOPSIDÆ.

Herpeton tentaculatum (Lacép.) figured by Jan, l. c. part i. pl. 1.

The following known species have been figured by Günther, Rept. Brit. Ind. :—

Hypsirhina enhydris (Schneid.), pl. 22. figs. K, K'; *Hipistes hydrinus* (Cant.), pl. 24. fig. H.

Cantoria violacea (Girard) receives a new name—*C. elongata*—this species being different from *Coronella violacea* (Cant.), Günther, p. 277.

Pythonia semizonata (Blyth) is considered to be identical with *Homalopsis buccata* by Günther, p. 285.

Homalopsis hydrinus (Cant.), *Hipistes fasciatus* (Gray), and *Bitia hydroides* (Gray) prove to be the same species: see Günther, p. 287.

Fam. RACHIODONTIDÆ. Prof. Peters describes some varieties of *Dasypeltis scaber*. Monatsber. Acad. Wiss. Berlin, 1864, p. 644.

Fam. DENDROPHIDÆ. Dr. Günther believed that the name of *Rhamnophis* given by him to a West African snake (Ann. & Mag. Nat. Hist. 1862, p. 129) is preoccupied, and therefore he substituted for it that of *Crypsidomus* (Proc. Zool. Soc. 1864, p. 309). We must add that this was caused merely by a misapprehension of the name of *Rhamphiophis* (Peters), so that *Rhamnophis*, as originally proposed, may be retained.

Gonyosoma gramineum, sp. n., Günther, Rept. Brit. Ind. p. 294, pl. 23. fig. D, probably from Khasya.

Phyllophis, g. n., allied to *Gonyosoma*, but with the nasal shield undivided, two præoculars, keeled scales in twenty-three series, &c.—*Ph. carinata*, Günther, l. c. p. 295, pl. 21. fig. B, from China.

Fam. DRYIOPHIDÆ. Günther, Rept. Brit. Ind., has given a figure of the head of *Tragops fronticinctus* (Gthr.), pl. 23. fig. E.

Tragops dispar is a new species from the Anamallay Mountains: Günther, p. 303, pl. 23. figs. A, A'.

Günther describes and figures *Passerita fusca* (Cope) under the name of *P. purpurascens* (p. 306, pl. 23. fig. F), the name of "*fuscus*" properly belonging to a variety of *P. mycterizans*.

Fam. DIPSADIDÆ. Günther, Rept. Brit. Ind., has figured *Dipsas boops* (Gthr.), pl. 24. fig. G; *Dipsas bubalina* (Klein), pl. 24. fig. E; *Dipsas ceylonensis* (Gthr.), pl. 23. fig. B.

Chamætorus, g. n., Günther, Proc. Zool. Soc. 1864, p. 310. Scales smooth, those of the vertebral row not enlarged; subcaudals two-rowed. Rostral moderate; nostril between two nasals; loreal united with lower anteocular. Posterior maxillary tooth grooved.—*Ch. ulicus*, pl. 26. f. 2, from the Zambesi.

Fam. LYCODONTIDÆ. Günther, Rept. Brit. Ind., has figured the head of *Tetragonosoma effrene* (Cant.), pl. 24. fig. K.

New species :—

Lycodon laoënsis, Günther, l. c. p. 317, from the Laos Mountains; *Lycodon anamallensis*, Günther, p. 318, from the Anamallay Mountains.

Fam. AMBLYCEPHALIDÆ. Prof. Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 273, describes a snake from Malacca, which he considers to be the type of a new genus, *Asthenodipsas*, the species being named *A. malaccana*; the head is figured (fig. 3). This snake is identical with the specimens named *Pareas laevis* (Kuhl) in the British Museum.

Fam. ERYCIDÆ. *Pseudoeryx bottæ* (Blainv.) and *Wenona plumbea* (Baird and Girard) are figured by Jan, l. c. part iii. pl. 2; *Eryx johonii* (Russ.) and *Eryx thebaicus* (Geoffr.), part iv. pl. 1; *Eryx jaculus* (L.), pl. 2; *Gongylophis conicus* (Schneid.), pl. 3.

Fam. PYTHONIDÆ. *Plastoseryx* (!) *bronni* is the name under which Jan figures *Loxocemus bicolor* (Cope), part iii. pl. 1. He refers this snake to the *Erycidæ*. Also the other species figured by that author are known :—

Morelia argus (L.), figured by Jan, part vii. pl. 5; *Liasis macklotii* (D. & B.), and *Nardoa schlegelii* (Gray), pl. 6; *Python molurus* (L.), young, part viii. pl. 2; *Python sebæ* (Gm.), pl. 3; *Python sebæ*, var. *natalensis*, pl. 4; *Python regius* (Merr.), pl. 5; *Python reticulatus* (Schneid.), pl. 6.

Fam. BOIDÆ. A young example of some species of *Boa* is figured by Jan, l. c. part i. pl. 2, with the name of *Acrantophis dumerilii*.—*Hab.*—?

Other species figured in the same work are :—

Leptoboa dussumieri (Schleg.), part ii. pl. 1; *Enygrus carinatus* (Schneid.) and *Enygrus bibronii* (D. & B.), pls. 2 & 3; *Trachyboa gularis* (Peters), pl. 2. f. 3; *Pelophilus madagascariensis* (D. & B.), pl. 4; *Platygaster multicarinatus* (Péron), part iii. pl. 3; *Tropidophis melanurus* (Schleg.), part v. pl. 1; *Tropidophis maculatus* (Bibr.) and *Boa constrictor* (L.), pl. 2; *Boa diviniolua* (Laur.), pl. 3; the same, var. *mexicana*, pl. 4; *Boa imperator* (Daud.), part vi. pl. 1; *Boa eques* (Eyd. & Soul.), pl. 2; *Euneetes murinus* (L.), pl. 3; *Homa-lochilus striatus* (Fisch.), pl. 4; *Chilabothrius inornatus* (Reinh.), pl. 5; *Epicrates angulifer* (D. & B.), pl. 6; *Epicrates cupreus* (Fisch.), part vii. pl. 1; *Xiphosoma caninum* (L.), pl. 2; *Xiphosoma hortulanum* (L.), pl. 3; *Xiphosoma madagascariense* (D. & B.), pl. 4; *Epicrates cenchris* (L.), part viii. pl. 1.

Aspidiotes, g. n., Krefft, Proc. Zool. Soc. 1864, p. 20. Scales smooth; head covered with regular, symmetrical shields; labials without pits; nostril in a single plate. Only a small number of the hinder subcaudals are bifid, the others being entire. *A. melanocephalus*, from Port Denison; (head figured). The Recorder is not convinced that this snake belongs to the *Boidea*; it is evidently allied to *Liasis*. Mr. Krefft has kindly despatched a specimen for the collection of the British Museum, so that a description of the dentition of this species can soon be given.

Tropidophis distinctus, sp. n., Jan, part v. pl. 1, said to be from Charleston, which is evidently erroneous.

Fam. ACROCHORDIDÆ. *Acrochordus javanicus* (Hornst.) is figured by Jan, l. c. part i. pl. 4.

Fam. ELAPIDÆ. Günther, Rept. Brit. Ind., figures *Callophis nigrescens* (Gthr.), pl. 24. figs. F, F'.

New species and genera :—

Ogmodon, g. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 274, is one of the most interesting additions to our knowledge of Ophidians; it is a small snake of Calamarian habit, with a series of about eight teeth in the maxillary, gradually decreasing in length posteriorly, the two anterior of which are perforated and grooved, the others showing a groove. Loreal none, replaced by the elongated præocular; scales smooth, in seventeen rows. *O. vitianus*, fig. 4, from the Feejee Islands.

Simotes australis, Krefft, Proc. Zool. Soc. 1864, p. 180 (with a woodcut), from Queensland.—The Recorder has examined this species; it is a venomous snake, belonging to the genus *Brachyurophis* (Gthr.).

Callophis annularis, Günther, l. c. p. 350, pl. 24. fig. I.

Elaps cerasinus, Beddome, Proc. Zool. Soc. 1864, p. 179, from Malabar. This supposed new species belongs to the genus *Callophis*.

Xenurelaps is a very interesting new genus established by Günther (l. c. p. 345) for *Elaps bungaroides* (Cant.), differing from *Bungarus* only by having bifid subcaudal shields.

Bungarus ceylonicus, Günther, l. c. p. 344.

Hoplocephalus ramsayi, Krefft, Proc. Zool. Soc. 1864, p. 180 (with a woodcut), from New South Wales.—*Hoplocephalus nigro-striatus*, Krefft, l. c. p. 181, from Rockhampton.

Causus rostratus, Günther, Proc. Zool. Soc. 1864, p. 115, pl. 15, from Ugogo (Central Africa).

Dendraspis polylepis, Günther, Proc. Zool. Soc. 1864, p. 310, from the Zambesi.

Fam. HYDROPHIDÆ. Dr. Günther (Rept. Brit. Ind.) has given a complete account of the species of this family; he admits *Platurus*, *Aipysurus*, *Disteira*, *Acalyptus*, *Enhydrina*, and *Pelamnis* as distinct genera, leaving all the other forms united in *Hydrophis*. *Platurus* and *Aipysurus* deviate so much from the other

genera, that each of them may be regarded as the type of a separate group. The species of *Hydrophis* are very numerous, and their determination is one of the most difficult parts in herpetology. Many species, previously distinguished, but imperfectly characterized, and therefore subsequently considered to be synonyms, have been reestablished by Dr. Günther, who examined the typical specimens; the following appeared to be new to science:—

Hydrophis robusta, p. 364; *H. melanosoma*, p. 367; *H. torquata*, p. 369; *H. atriceps*, p. 371; *H. latifasciata*, p. 372; *H. coronata*, p. 372; *H. diadema*, p. 373; *H. cantor's*, p. 374; *H. longiceps*, p. 375; *H. stricticollis*, p. 376; *H. elliotti*, p. 377.

The heads and characteristic portions of the body of the greater part of the species are figured on plate 25.

Fam. CROTALIDÆ. Dr. Günther (Rept. Brit. Ind.) has figured the head of *Trimeresurus strigatus* (Gray), pl. 24. fig. D.

New species and genera:—

Trimeresurus anamallensis, Günther, l. c. p. 387, pl. 24. fig. C, from the Anamallay Mountains; *Trimeresurus monticola* (*Purias maculata*, Gray), Günther, p. 388, pl. 24. fig. B, from the Himalayas.

Pelteporor, g. n., founded by Günther, p. 390, on *Trimeresurus macrolepis* (Beddome), and distinguished from *Trimeresurus* by its very large scales. The species is figured on pl. 23. fig. C.

Halys himalayanus, Günther, p. 393, pl. 24. fig. A, from the Himalayas; *Halys pallasii*, Günther, p. 392, from Tartary.

Caudisona basiliscæ, Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 166, from Mexico.

Fam. VIPERIDÆ. *Atheris polylepis*, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 642, from Liberia. According to a private communication from Prof. Peters this snake is identical with *Vipera chloroëchis* (Schleg.), the scales of which had been erroneously described.

PSEUDOPHIDIA.

Prof. Duméril has published a catalogue of the species in the collection of the Paris Museum, Mém. Soc. Sc. Nat. Cherbourg, ix. 1863. One is new, viz. *Rhinatrema unicolor*, pl. 1. figs. 6 & 7, from Cayenne.

The Recorder has discovered a very singular organ in the male of *Epicrion glutinosum*; it is evidently an organ of copulation, situated in the cloaca, and composed of four bilobed prominences; it is exsertile, and retracted by a long, tape-like, bifid muscle. This, in connexion with their imperfect metamorphosis and with the presence of dermal productions, appears

to indicate such an affinity of the Cæcilians to the more highly organized Reptilia, that they ought to be placed as an intermediate group between the Ophidians and the Batrachians. Figures of the sexual organs of male and female are added.—Rept. Brit. Ind. p. 442.

Prof. Peters has received a young specimen of *Epicrion glutinosum*, $4\frac{1}{2}$ inches long, in which the foramina of the gills were still open; it was found near Malacca, in the water. The openings, two on each side, are of equal length, whilst the anterior was one-half shorter than the posterior in the specimen described by Müller. They are situated on the upper margin of the yellow band, and not in its middle. Distinct gills are not present; eyes more distinct than in the adult, and there is an impression in front of each eye. The posterior extremity of the body is compressed, and surrounded with a vertical fin-like expansion of the skin, which commences at a distance of $7\frac{1}{2}$ mm from the extremity of the body.—Monatsber. Acad. Wiss. Berl. 1864, p. 303.

BATRACHIA.

Prof. J. D. Dana (Amer. Journ. Sc. and Arts, 1864, p. 181) discusses the question whether Amphibians (Batrachians) should be made the inferior division of the class of Reptiles, or whether they should be separated as an independent class. Its solution depends much upon the other question, whether greater weight is to be attached to the characters of species in their finished or adult state, or to the special series of changes through which the adult characteristics are reached. The author refers to the fact that, as regards the subkingdoms in animal life, embryology, in the hands of the best embryologists, has only sustained what Cuvier had derived from the study of the adult animals themselves; and as to the subordinate divisions under the subkingdoms there is not only great diversity in the different embryological systems, but violations of natural affinities in all. Therefore, in a question of the relations of Amphibians to ordinary reptiles, it is safer to be guided by the adult animals than by their eggs and young. But in the adult state the species are reptiles in all essential structural characters.

This view, viz. that Amphibians form a distinct group in the class of Reptiles, is strengthened by the analogy drawn from other classes of Vertebrates; the Mammals have their *inferior* subdivision—the “Ootocoids” or semiovo viviparous species (Marsupialia and Monotremata); the Birds have their *inferior* subdivision—the “Erpetoids” (Archæopteryx); and between ordinary Reptiles and Fishes, there are the Amphibians, forming a similar hypotypic subdivision of Reptiles.

BATRACHIA SALIENTIA.

Fam. DACTYLETHRIDÆ. Dr. Gray describes the tadpole of a West African Batrachian as the type of a new form which he names *Silurana intertropicalis* (Ann. & Mag. Nat. Hist. 1864, xiv. p. 315). In a paper published some weeks afterwards in the 'Proceedings of the Zoological Society' (p. 458), he enters more minutely into the affinities of this tadpole, which is distinguished by a pair of long maxillary barbels gradually becoming shorter with the growth of the animal, and admits the possibility of its finally proving to be the young state of *Dactylethra*. However, he thinks that our present knowledge of this tadpole is not complete enough to admit of our proving its identity with *Dactylethra*, and he therefore retains the genus *Silurana*, distinguishing it by the thickened, "shield-like" dorsal integument. The Recorder may add that *Silurana* without doubt sheds its integuments, as other Batrachians, towards the close of the metamorphosis, and that Prof. Peters, in his unpublished work on Mozambique Reptiles, as well as Prof. Wyman (Proc. Bost. Soc. ix. p. 155), have described or figured this tadpole as a young *Dactylethra*.

Dr. Gray shows in the same paper that all the old specimens of *Dactylethra* in the British Museum have the small appendage below the orbit considered by Peters peculiar to his *D. mülleri*; he therefore supposes that *D. laevis* is founded upon specimens in which the appendage has been overlooked, or accidentally disappeared, and that *D. mülleri* is identical with *D. laevis*.

Fam. RANIDÆ. No Batrachian of this family had been known from Australia; the Recorder (Proc. Zool. Soc. 1864, p. 46) describes one which is the type of a new genus, *Mixophyes*: habit as in *Rana*; tongue not notched; vomerine teeth in two series; lower jaw without tooth-like apophyses; tympanum distinct. No finger opposite to the others; web between the toes well developed; a long, compressed, subsemicircular tubercle at the metatarsus. *M. fasciolatus*, pl. 7. fig. 1, from the Clarence River.

Rana temporaria is very common in the Upper Engadin, and is generally found in the Alps at an altitude of from 7000 to 8000 feet, whilst *R. esculenta* never leaves the lower country. It is not probable that the metamorphosis of these frogs extends over two years in the Alpine regions; but the period of propagation may vary and the development of the larvæ may be retarded according to the different elevations. Frogs engaged in copulation, and larvæ considerably advanced in their metamorphosis may be seen in the month of June in pools covered with ice, or in water the temperature of which is at the freezing-point. Fatio, in Bibl. Univ. 1864, p. 270.

Rana cæruleo-punctata, sp. n., Steindachner, Verh. zool. bot. Ges. Wien, 1864, p. 264, taf. 15. fig. 1 (habitat unknown); *Rana ida*, Steind. l. c. p. 266, taf. 12. fig. 1, from Madagascar, very probably identical with *R. mascariensis*

(D. & B.); *Rana nigrescens*, Steind. l. c. p. 268, taf. 12. fig. 2, from Madagascar.

Pyxicephalus rugosus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 479, pl. 33. fig. 1, from Angola.

Phrynobatrachus natalensis (Gthr.) has been identified by Günther with *Stenorhynchus natalensis* (Smith). *Phrynobatrachus* is prior to *Leptoparius* proposed by Peters for *Stenorhynchus*, which is preoccupied. The species occurs on both sides of tropical Africa, and is redescribed. Proc. Zool. Soc. 1864, p. 480.

Fam. CYSTIGNATHIDÆ.

Cystignathus bocagii, sp. n., Günther, Proc. Zool. Soc. 1864, p. 481, pl. 33. fig. 2, from Angola.

Cystignathus caliginosus (Girard) has been described and figured by Steindachner as *Platyantis petersii*, Verh. zool. bot. Ges. Wien, 1864, p. 254, taf. 16. fig. 2; *Cystignathus ocellatus* (L.), young, figured *ibid.* p. 269, taf. 11. fig. 1.

Eupemphix. This genus had been founded by Dr. Steindachner for a frog similar to *Pleurodema*, but without vomerine and maxillary teeth. In the Verhandl. zool. bot. Ges. Wien, 1864, p. 271, he corrects the characters, having found the maxillary teeth in a second specimen, but attempts to retain the genus, although it is difficult to see that the difference between *Eupemphix* (Steindachner) and *Pleurodema* is greater than that between *Polypedates* and *Hylorana* which he unites. The two species referred to *Eupemphix* are

1. *E. nattereri*, Steindachner, l. c. p. 271. This is said (p. 552) to be most probably identical with *Gomphobates notatus* (Rhdt. & Ltk.).

2. *E. fusconotatus*, Steindachner, l. c. p. 272, taf. 13. fig. 3. This is undoubtedly identical with *Pleurodema vibronii* (Tschudi). The Recorder has examined the numerous examples in the British Museum, and found that every fourth specimen wants the vomerine teeth, but all have very distinct maxillary teeth. The shape of the tongue, whether it be broader or narrower, varies much according to the contraction probably caused by the influence of the spirits in which the specimens were preserved.

Gomphobates (Reinh. & Ltk.). Steindachner, Verh. zool. bot. Gesellsch. Wien, 1864, describes and figures two Batrachians which will enter this genus:

1. *Leiuperus albonotatus*, p. 275, taf. 16. fig. 4, from Brazil. This species is afterwards, p. 551, identified with *Gomphobates notatus* (Rhdt. & Ltk.).

2. *Leiuperus ephippifer*, p. 277, taf. 14. fig. 1, and taf. 16. fig. 5, from Brazil. This is most probably identical with *Gomphobates Kroyeri* (Rhdt. & Ltk.). The observation made by the author that females of these two species have a small lumbar gland, is confirmed by a specimen in the British Museum.

Fam. DISCOGLOSSIDÆ.

Megalophrys chysii, sp. n., Edeling, Nederl. Tydschr. Dierk. 1864, p. 205, from Sumatra.

Fam. ASTEROPHYRIDÆ.

Xenophrys is a new genus described by Günther, Rept. Brit. Ind. p. 414, allied to *Megalophrys*, but having free toes, as the other genera of this family. The upper eyelid is well developed, broad, with a sharp, prominent edge, but not prolonged into appendages.—*X. monticola*, pl. 26. fig. II, from the Himalayas.

Günther, Proc. Zool. Soc. 1864, p. 47, states that *Camariolius* (Peters) is identical with *Pterophrynus* (Lütken), and doubts the propriety of separating the latter from *Crinia* (Tschudi); he describes as new: *Pterophrynus affinis*, p. 47, pl. 7. fig. 2, from Western Australia; *Pterophrynus tasmaniensis*, p. 48, fig. 3; and *Pterophrynus levis*, p. 48, fig. 4, from Van Diemen's Land.

Fam. UPEROLIIDÆ.

According to the characters known, a genus established by Steindachner, Verhand. zool. bot. Gesellsch. Wien, 1864, p. 279, would enter this family:

Nattereria: habit ranoid; tongue slightly emarginate; vomerine teeth none. *N. lateristriga*, taf. 14. fig. 2, from Brazil.

Fam. BOMBINATORIDÆ.

Dr. Steindachner defines the characters of *Telmatobius* (Wiegman), and describes a new species, *T. brasiliensis*: Verh. zool. bot. Gesellsch. Wien, 1864, p. 282, taf. 16. fig. 3.

Fam. BRACHYCEPHALIDÆ. Dr. Steindachner states that he has recognized the identity of *Kakophrynus* (Steind.) with *Hemiscus* (Gthr.), and that the reason why he did not do so from the first, lies in the erroneous description of the latter genus. The Recorder has reexamined *Hemiscus*, and found that the original diagnosis given by him is correct,—the extremities of the sacral apophyses being 2 lines broad in a specimen $2\frac{1}{2}$ inches long; the tongue, when at rest, is elliptical.

Fam. RHINODERMATIDÆ.

The name of *Uperodon* (D. & B.) being preoccupied, has been changed into *Cacopus* by Günther, Rept. Brit. Ind. p. 415.

Cacopus globulosus is a new species from Russelconda. Günther, l. c. p. 416, pl. 26. fig. K.

Copea, g. n., Steindachner, Verhand. zool. bot. Gesellsch. Wien, 1864, p. 286, said to be closely allied to *Atelopus* (D. & B.), but with two large tubercles on the metatarsus. *C. fulva*, taf. 17. fig. 5, from Brazil.

Fam. ENGYSTOMATIDÆ.

Dr. Steindachner figures *Engystoma ovale* (Schneid.) and *Engystoma microps* (D. & B.): Verhand. zool. bot. Gesellsch. Wien, 1864, p. 285, taf. 18. fig. 4, and taf. 15. fig. 3.

Fam. BUFONIDÆ.

Bufo vulgaris is not very common in the Upper Engadin, and does not attain to the same large size as in the lowlands. Fatio, in Bibl. Univ. 1864, p. 273.

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Bufo galeatus, n. sp., from Gamboja. Günther, p. 421, pl. 26. fig. L.

Paludicola pustulosa, n. sp., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 180, from New Granada. The author observes that *Paludicola* is a genus of Wagler's which has been latterly overlooked. It lacks the parotoids, and differs from *Schismaderma* in the free toes and tarsal spur, in this last respect resembling *Gomphobates biliginigerus*.

Fam. POLYPEDATIDÆ.

Hylorana macularia (Blyth) is figured by Günther, Rept. Brit. Ind. pl. 26. fig. C.

Polypedates. Dr. Steindachner cannot have had an opportunity of examining many species of *Polypedates* or *Hylorana*, otherwise he would not have proposed to unite these two most distinct genera (Verh. zool. bot. Ges. Wien, 1864, p. 251). His remark, that the character of a rudiment of a membrane between the fingers is insufficient to distinguish them, is true; but *Hylorana* has a lateral glandular fold, constantly absent in *Polypedates*.

Polypedates quadrilineatus (Boie). Dr. Steindachner (Verh. zool. bot. Ges. Wien, 1864, p. 253, taf. 10. fig. 2) says that the Vienna Collection has received specimens through Ida Pfeiffer from Madagascar. Although it is not impossible that an Indian species should occur in that island, we must bear in mind that the collections made by that lady at various places were much mixed, as is abundantly proved by the specimens obtained from her for the British Museum.

Polypedates goudotii (Bibr.) has been figured by Steindachner, Verh. zool. bot. Ges. Wien, 1864, p. 253, taf. 10. fig. 1.

New species :—

Hylorana temporalis, Günther, Rept. Brit. Ind. p. 427, pl. 26. fig. G, from Ceylon.

Polypedates pleurostictus, Günther, l. c. p. 430, pl. 26. fig. I, from Madras; *Polypedates reticulatus*, Günther, p. 431, pl. 26. fig. F, from Ceylon.

Ixalus temporalis and *I. femoralis*, both from Ceylon: Günther, l. c. p. 434, pl. 26. figs. E & D.

Hyperolius (Rapp). This name is, most unfortunately, preoccupied by *Uperoleia* (Gray), which is merely a less correct form of the same compound word. If it should be considered necessary to substitute another name for that introduced by Rapp, the Recorder would propose the name of *Rappia*.

Hyperolius nasutus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 482, pl. 33. fig. 3, from Angola; *Hyperolius reticulatus*, sp. n., Günther, l. c. fig. 4, probably from West Africa.

Three other new species from the Zambesi-regions are described by Günther, Proc. Zool. Soc. 1864, viz. *H. flavo-maculatus*, p. 310, pl. 27. fig. 1, *H. citrinus*, p. 311, pl. 27. fig. 2, and *H. microps*, p. 311, pl. 27. fig. 3.

Hyperolius heuglini, sp. n.?, Steindachner, Verh. zool. bot. Gesellsch. Wien, 1864, p. 244, taf. 15. fig. 4, from Abyssinia. The author is in doubt whether the specimen to which this name has been given, is not "the young and variety of colour" of *H. guttulatus* (Gthr.). In this respect we may assure him that no two species of *Hyperolius* are more distinct than those in question. The species in the Vienna Museum may be compared with greater propriety

- with *H. microps* (Gthr.), as far as we can judge from the figure illustrating the *H. heuglini*. However, the adult *H. microps* (male with the vocal sac fully developed) is scarcely larger than the specimen of *H. heuglini* which is young, and has all the fingers connected by a short web, whilst the three inner ones are said to be quite free in *H. heuglini*.

Fam. HYLODIDÆ.

Hylodes varians, sp. n., Gundlach & Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 390, from Cuba; *Hylodes güntneri*, sp. n., Steindachner, Verh. zool. bot. Ges. Wien, 1864, p. 246, taf. 17. fig. 1, from Brazil; *Hylodes truncatus*, sp. n., Steind. l. c. p. 248, taf. 17. fig. 3. From Brazil *Hylodes fenestratus*, Steind. l. c. p. 249, taf. 16. fig. 1, from Brazil. From an additional note (p. 552) it appears probable that this last species is identical with *H. griseus* (Hallow.).

Hylodes griseus (Hallow.). Steindachner has given a figure of a specimen so determined by him, Verh. zool. bot. Ges. Wien, 1864, p. 245, taf. 17. fig. 2. It is to be regretted that he has not added the distinctive characters of this species, the W-shaped spot on the nape being present in many specimens of *H. martinicensis*.

Halophila platydactyla, sp. n., Günther, Proc. Zool. Soc. 1864, p. 49, probably from the Feejee Islands.

Fam. HYLIDÆ.

Litoria wilcoxii, sp. n., Günther, Proc. Zool. Soc. 1864, p. 48, from the Clarence River, Queensland.

Hyla spinosa, sp. n., Steindachner, Verhandl. zool. bot. Ges. Wien, 1864, p. 239, taf. 9. fig. 1; perhaps from Brazil. This species reminds us of *Opisthodelphys* by its spines in the supratympanic region, and by its coloration. The author does not state the age or sex of his specimen.

Hyla pulchella (D. & B.) is identical with *H. agrestis* (Bell) and *H. prasina* (Burmeister). Steindachner, Verhandl. zool. bot. Gesellsch. Wien, 1864, p. 241, taf. 9. fig. 2.

Hyla leucophyllata (Beiris). Dr. Steindachner makes some remarks on the coloration and habits of this species. Verh. zool. bot. Gesellsch. Wien, 1864, p. 243.

Hyla bipunctata (Spix) is identified by Steindachner (Verh. zool. bot. Ges. Wien, 1864, p. 262, taf. 11. figs. 2-4) with *Lysapsus limellum* (Cope). He describes it under the false name of *Pseudis minuta* (Gthr.)! and we are perfectly at a loss to understand how such a manifest error could take place.

Phyllomedusa dacnicolor, sp. n., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 181, from Mexico. This species has the toes one-third webbed, and the parotoids exceedingly weak if present; therefore it is more probably a *Hyla* than a *Phyllomedusa*.

Trachycephalus marmoratus (D. & B.). Dr. Steindachner figures a specimen as it appears after long preservation in spirits. Verh. zool. bot. Ges. Wien, 1864, taf. 9. fig. 3.

Fam. HYLÆDACTYLIDÆ.

Günther, Rept. Brit. Ind. p. 436, makes some further observations on *Cal-*

lula picta (D. & B.), and considers that the question of the identity or non-identity of *Callula* and *Plectropus* is not settled.—On the other hand, Steindachner agrees with Peters that both are distinct; Verh. zool. bot. Ges. Wien, 1864, p. 256; he adds a figure of *Hyladactylus conjunctus* (Pet.), taf. 11. fig. 5.

Callula obscura, sp. n., from Ceylon: Günther, p. 438.

Fam. HYLAPLESIDÆ.

Dr. Steindachner (Verh. zool. bot. Ges. Wien, 1864, p. 257) has identified *Hylaplesia picta* (Tschudi) with *Hyla nigerrima* (Spix) and (p. 260) *Phyllobates auratus* (Girard) with *Dendrobates tinctorius* (Wagl.). Both species are figured, the former on taf. 13. fig. 2, the second on taf. 15. fig. 2 and taf. 13. fig. 1.

BATRACHIA GRADIENTIA.

Chioglossa, g. n., Bocage, Proc. Zool. Soc. 1864, p. 264. Tongue large, oblong, attached to the lower jaw anteriorly, free on the sides and behind, fixed by a long pedicel in the middle. Two longitudinal series of palatine teeth, nearly confluent in front, parallel in the middle, and much divergent behind. Toes 4–5, the inner one very short. No conspicuous parotoids; skin nearly smooth. No osseous temporo-frontal arch.—*Ch. lusitanica*, pl. 21, from Coimbra.

Salamandra maculosa. Ritter von Frauenfeld relates two cases in which females of this species have been kept in solitary confinement during the winter, and brought forth young ones in February; so that the copulation must evidently have taken place in the summer of the year preceding. Verhandl. zool. bot. Gesellsch. Wien, 1864, p. 121.

Triton igneus. This species is described at great length by M. Fatio, in Bibl. Univ. 1864, p. 275; he uses the name *T. alpestris*. It is, besides *Salamandra atra*, the only tailed Batrachian found in the Alpine region, and is common in the Upper Engadin. The author has found young examples which had passed the metamorphosis, on land in the month of June; they must evidently have belonged to the brood of the preceding year, as it is well known that these Batrachians do not grow during the winter; but this simple explanation not being satisfactory to M. Fatio, he suggests that this species may possibly have adapted itself to the peculiar conditions of its elevated locality, and have become ovo-viviparous! Bibl. Univ. 1864, p. 275.

Cryptobranchus. Hyrtl gives notice that he is about to publish a memoir on the anatomy of this Batrachian, and states its contents. Sitzgsber. Acad. Wiss. Wien, 1864, vol. 50, June, p. 48.

PISCES

BY

ALBERT GÜNTHER, M.A., M.D., Ph.D.

A. *Works in Progress.*

Catalogue of the Fishes in the British Museum. By ALBERT GÜNTHER. London, 8vo.

Like several of the Catalogues published by the Trustees of the British Museum, the present work contains descriptions not only of the species represented in the British Museum, but also of those known to exist in other collections; that is to say, it forms a complete handbook of Ichthyology, in which all the species known are described and systematically arranged. During the last thirty years the number of species has been so much increased, that without such a handbook their determination has become a matter of great difficulty and uncertainty. Besides, with the increase of our knowledge, the growing defects of the system proposed by Cuvier and Müller have become apparent, rendering necessary a further subdivision of the families and a revision of the genera. Such a work could not be successfully undertaken without the aid of the richest collection of materials combined with a library in which scarcely any publication referring to the subject is wanting. Of course the author has been obliged to leave many doubtful points in the state in which he found them, whenever, in fact, his materials did not enable him critically to examine and complete the insufficient descriptions of previous authors; indeed, in such an extensive work it could not but be expected that errors should occur which might have been avoided; but on the whole it is already apparent that his work is as useful to Ichthyologists generally as it has been beneficial to the collection on which it was based.

Up to the present time five volumes have been published: the first three, issued in the years 1859-61, are taken up with the Acanthopterygians, of which 3481 species are known; 2811 of them are considered to be well characterized and described, the remainder being merely quoted as forms which require further confirmation. In Cuvier and Valenciennes's '*Histoire Naturelle des Poissons*,' the last published general ichthyological

work, only 2146 species of this order are enumerated, and about 600 of these are considered by Dr. Günther to have been nominal species. To the third volume he has added a systematic synopsis of the families of this order, showing his views as to their natural affinities. It is intended to illustrate this portion of the work with a series of plates, the execution of which has been commenced, but which will be published at a later period.

The fourth volume, published in 1862, contains the *Acanthopterygii Pharyngognathi* and *Anacanthini*, these two orders comprising 1090 species, of which 890 are well characterized.

The fifth volume, published in 1864, falls within the limits of this Record, and commences the order of *Physostomi*, containing the families of *Siluridae*, *Characinidae*, *Haplochitonidae*, *Sternoptychidae*, *Scopelidae*, and *Stomiidae*. 1005 species are enumerated against 492 of Cuvier and Valenciennes's 'Histoire Naturelle des Poissons'; 849 are considered to be well characterized, a considerable portion of them being described for the first time.

Atlas Ichthyologique des Indes Orientales Néerlandaises, par M. P. BLEEKER. Amsterdam, fol.

Dr. Bleeker has commenced collecting the results of his numerous labours on the Ichthyology of the East Indian archipelago in a splendid work published under the auspices of the Dutch Colonial Government. All the species observed by the author during nearly twenty years of ichthyological study are described and figured. The descriptions are more or less republications of those formerly given. The plates are coloured from drawings made in India, and very accurate, and therefore quite sufficient for scientific purposes; figures of the dentition are added to many species. On the whole, the work is invaluable and almost indispensable for the determination of the fishes of that fauna: if it has a defect, it lies in the systematic attempts, and also in the nomenclature of the author, the most trivial characters being used for the distinction of genera and groups; and we have no doubt that Dr. Bleeker himself will hereafter considerably reduce the number of these, as he has done with the species formerly described by him. The work has appeared very regularly, the following volumes having been published:—

Vol. I. SCAROIDES et LABROIDES. 1862, pp. 168, with 48 plates.

Vol. II. SILUROIDES, CHACOIDES, et HETEROBRANCHOIDES. 1863 (1862, according to the title-page), pp. 112, with 53 plates.

Vol. III. CYPRINS. 1863, pp. 150, with 43 plates.

Vol. IV. MURÆNI. pp. 112, with 49 plates. (Livraisons 14–16 in 1864, livraison 17 in 1865.)

- The History of the Fishes of the British Islands. By JONATHAN COUCH. London, 8vo.

The book before us embraces the observations of a man who commenced his ichthyological studies as early as Yarrell, who himself, as is well known, has drawn largely from the experience of Mr. Couch. Therefore we might well expect to find a great deal of useful information in it; and indeed it gives us a most complete account of the life and habits of British fishes, especially of those observed by the author on the Cornish coast. Mr. Couch has carried on his researches in the field, and has not followed the strict technical method of distinguishing species; but he has at the same time not neglected scientific sources of information, thus producing a most useful and instructive book, which may be easily read and understood by every lover of natural history. He has introduced the latest additions to the British Fauna; and as, moreover, he is not inclined to drop species which have been proved to be nominal, the number of British species has been considerably increased. Nearly all are illustrated by coloured plates, which, however, are inferior to those given by Bloch and Donovan. Up to the present time three volumes have been published:—

Vol. I. contains the Chondropterygians, Percoids, and Sparoids. 1862, pp. 245, with 57 plates.

Vol. II. contains Trigloids, Trachinoids, Sciænoids, Scombroids, Gobioids, Blennioids, and Trachypteroids. 1863, pp. 265, with 63 plates.

Vol. III. contains the remainder of Acanthopterygians, Pharyngognaths, and Anacanthines. 1864, pp. 208, with 48 plates.

B. Separate Publications.

JEITTELES, L. H. Die Fische der March bei Olmütz. Jahresbericht des Olmützer K. K. Gymnasiums für 1863 (part 1) and 1864 (part 2), pp. 59.

The author has described in this ably written memoir 38 species occurring in the river March near Olmütz. By a careful examination and comparison of his specimens with the descriptions of the same species from other localities, Hr. Jeitteles has been enabled to add some valuable notes on those characters which ought to be more particularly attended to, on account of the variations to which they are subject. He concludes his paper with some interesting general remarks: it would appear that the March, when compared with other tributaries of European rivers, is very rich in species, being surpassed in this respect by the Theiss only. *Chondrostoma nasus*, *Abramis vimba*, and *Squalius cephalus* are the species most common in this river, forming about 30 per cent. of all its fishes; *Leuciscus*

rutilus, *Alburnus lucidus* and *A. bipunctatus*, and *Rhodeus amarus* form 25 per cent. ; the Barbel, Tench, and Burbot 15 per cent. ; Gudgeon, Minnow, and Loach 10 per cent. ; Rudd, Bream, *Idus melanotus*, and *Aspius rapax* 5 per cent. ; Pike and Perch 5 per cent. ; *Silurus glanis* 1 per cent. ; 9 per cent. would consist of the remaining species.

Bidrag till Kännedomen om *Pterycombus brama* (Fries), en fisk af Makrillfiskarnes famili. By WILHELM LILLJEBORG. Upsala, 1864, 4to (pp. 9).

This memoir was written on the occasion of a festival of the University of Upsala, and published by the University.

C. Papers published in Journals.

MALMGREN, A. J. Kritisk Öfversigt af Finlands Fisk-Fauna. Akademisk Afhandling. Helsingfors, 1863, 8vo. Translated into German by Dr. C. F. Frisch in Wiegmann's Arch. 1864 (pp. 259-351).

We are indebted to the Editor of Wiegmann's 'Archiv f. Naturg.' for the above German translation, which, being published in 1864, brings this memoir within the limits of the present Record. The author commences his paper by defining the natural boundaries of Finland. Towards the north and south the country is bordered by seas, or arms of the sea ; there is no boundary-line between Scandinavia and Finland, both being identical geognostically, zoologically, botanically, and—the author adds modestly—also ethnographically ; but there is a strong contrast towards Russia, from which it is separated by a broad tract of sandy plains covered with dense forest, and extending from the White Sea to Lake Ladoga. West of this boundary all is Scandinavio-Finnish ; east of it commence Russia and Siberia.

The number of known species of fishes within these limits is eighty, which are distributed as follows :—

a. The northern shores are inhabited by 33 species,

α. 7 of which are found in the White Sea only, viz. *Cottus quadricornis*, *Liparis lineatus*, *Anarrhichas pantherinus*, *Platessa dvinnensis*, *Gadus navaga*, *Gadus saida*, and *Clupea harengus* var. *membras*.

β. 23 are found also in Western Finmark, and

γ. 3 belong to the arctic marine fauna proper, viz. *Liparis barbatus* from Spitzbergen, *Phobosia tricuspis* from Greenland and Spitzbergen, and *Aspidophorus decagonus* from Greenland.

b. The true freshwater species are 38 in number.

α. Two of them—*Cobitis barbatula* and *Pelecus cultratus*—are not found in the Scandinavian Peninsula, and evidently draw their origin from Russia.

β. *Cobitis tænia*, *Petromyzon planeri*, and perhaps also *Gobio fluviatilis* and *Aspius rapax* are also of Russian origin.

γ. The other 32 species are of Scandinavian origin.

c. The marine species of the Baltic coasts are 21 in number.

a. 11 belong to the fauna of the German Ocean, viz. *Cottus bubalis*, *Spinachia vulgaris*, *Gobius niger*, *Gobius minutus*, *Rhombus maximus*, *Ammodytes lanceolatus*, *Belone vulgaris*, *Clupea sprattus*, *Siphostoma typhle*, *Nerophis ophidion*, and *Acipenser sturio*. All these fishes are of comparatively rare occurrence on the Finnish shores of the Baltic, where they do not propagate their species; so that only *large* individuals are met with. Therefore the author concludes that the individuals of these species have migrated eastwards from the Baltic.

β. The 10 others are common to the Baltic and the Glacial Ocean, viz. *Cottus scorpius*, *Cottus quadricornis*, *Cyclopterus lumpus*, *Liparis barbatus*, *Centronotus gunellus*, *Zoarces viviparus*, *Platessa flesus*, *Gadus morrhua*, *Clupea harengus* var. *membras*, and *Petromyzon marinus*. Some of them are very common to the extremities of the Bothnian and Finnian Gulfs; they propagate their species, and agree with their "forefathers" in the Glacial Ocean in every point, but remain comparatively smaller, leaner, almost starved. Especially three of them—*Cottus quadricornis*, *Liparis barbatus*, and *Clupea harengus* var. *membras*—deserve particular attention; they are limited to the northern parts of the Baltic only, and entirely absent in the southern portions and on the western coasts of Scandinavia. Therefore nobody will suppose that they have come into the Baltic through the Sound. How, then, is the presence of these arctic fishes in the Bothnian Gulf to be explained?

Prof. S. Lovén has lately shown that several small animals of marine origin are found in the great lakes of Sweden and Finland, and in the Baltic. They have never been met with in the German and Atlantic Oceans, but several of them (*Idothea entomon*, *Gammarus loricatus*, *Halicryptus spinulosus*, and *Polynoë sarsi*) are found again in the coldest parts of the Glacial Ocean, these arctic representatives being more developed than the southern ones. Prof. Lovén explains the presence of these animals in Scandinavia by the great depth of the freshwater lakes, and by the former continuity of the Baltic with the Glacial Ocean. During the second half of the Glacial period the greater part of Finland and of the middle of Sweden were submerged, and the Baltic was a great gulf of the Glacial Ocean and not connected with the German Ocean. By the gradual elevation of the Scandinavian continent, the Baltic became disconnected from the Glacial Ocean, and the great lakes separated from the Baltic. In consequence of the gradual change of the salt water into fresh, the marine fauna became gradually extinct, with the exception of the glacial forms mentioned above.

This theory is adopted by Dr. Malmgren, who believes that not only the three species of fishes named, but also *Cottus scorpius*, *Cyclopterus lumpus*, *Zoarces viviparus*, *Gadus morrhua*, and perhaps also *Pleuronectes flesus* are remnants of the former glacial marine fauna, and not the produce of an immigration from the German Ocean through the Sound.

[It would appear to the Recorder that the evidence brought forward to prove a former continuity of a part of the Finnish fauna with that of the Glacial Ocean is very conclusive, and we have therein an instance analogous to the well-known identity of a part of the marine faunas of both sides of the Isthmuses of Panama and Suez. But the supposition of a former continuity of the seas does not suffice to explain all the cases in which we observe a discontinuity of the species at the present period. A number of marine forms found in the Mediterranean and in the West-Indian Islands occur again in Japan, without the slightest trace of their ever having been met with in the intermediate seas. One species of *Cyttus* occurs in Madeira, the other in Van Diemen's Land. It would be a bold supposition, and difficult to believe, that a continuity of the fauna between those remote points existed at a former period, and that, for instance, the *Lophotes* and *Centriscus* of the Mediterranean and of Japan are the descendants of one and the same widely spread species. There is another point, to which we must direct particular attention, viz. that all the Scandinavian species believed to be of arctic origin, and to have survived under greatly altered circumstances from the time of the Glacial period, have not changed their specific characters, still agreeing with their "forefathers" in every point, except in size.]

After these introductory remarks the author passes to an enumeration of the species, a part of which are described; these and others, the knowledge of which has been advanced by original observations, will be mentioned below. A part of the synonymy of each species is added, but we observe with regret that it is not compiled with impartiality: Yarrell and Couch, whose works are of a popular character, and ought not to be judged according to the standard of strictly scientific publications, are repeatedly denounced for their insufficient descriptions and bad figures, whilst Kröyer's wretched copies are allowed to pass scot free.

COOPER, J. G. On new genera and species of California Fishes. No. I. Proc. Calif. Acad. Nat. Sc. iii. 1863, November (pp. 70-77, with figures); No. II. *ibid.* December (pp. 93-97); No. III. 1864, January (pp. 108-)*.

GARRETT, A. Descriptions of new species of Fishes. Proc.

* See note, p. 139.

Calif. Acad. Nat. Sc. vol. iii. 1863, November, and 1864, January*.

Catalogue préliminaire des Poissons d'eau douce de Portugal, conservés au Muséum d'Histoire naturelle de Lisbonne. Par M. F. H. STEINDACHNER, de Vienne. Lisbonne, 1864, 4to, pp. 3.

This small pamphlet appears to have been issued as a separate publication, and will be followed by other parts. The author enumerates nine species in the present part, two being described as new.

MARCUSEN, J. Die Familie der Mormyren. Mém. Acad. Sc. St. Pétersb. 1864, vii. (pp. 162, with 5 plates).

GÜNTHER, A. Description of a new species of *Mormyrus*. Proc. Zool. Soc. 1864, January 26 (p. 22, with a plate).

STEENSTRUP, J. Bidrag til en rigtigere Opfattelse af Skejvheden hos Flynderne (*Pleuronectides*) og til Forklaring af begge Oines Fremkomst paa samme Side af Kroppen. Cefvers. Dansk. Vidensk. Selsk. Förhandl. 1863, November 20 (pp. 145-192, with woodcuts and a plate). An abstract in Ann. Sc. Nat. 1864, ii. November, pp. 253-258.

NILSSON, S. Två for Skandinaviska Faunan nya fiskar af Makrill-familjen; jemte några andra till var fisk-fauna höranda iakttagelser. Cefvers. Svensk. Vetensk. Akad. Förhandl. 1864 (December 9, 1863, pp. 499-503, with two plates).

KNER, R. Einige für die Fauna der österreichischen Süßwasserfische neue Arten. Verh. Zool. Bot. Ges. Wien, 1864, January 13 (pp. 75-84).

Prof. Kner describes in this paper several fishes (*Acerina rossica* and three *Gobius*), new to the fauna of Austria. In the second part of the paper, he agrees with Prof. v. Siebold as regards the doubtful specific character of several (especially Cyprinoid) species described in the "Süßwasserfische der österreichischen Monarchie."

JÄCKEL, A. J. Die Fische Bayerns. Abhandl. Zool.-mineral. Verein. Regensb. 1864, pp. 101.

The author enumerates 68 species occurring in Bavaria, adding to each of them notes of chiefly local interest. He has

* We regret not being able to give the whole contents of this valuable paper in our present Record, as sheets 3, 4, and 8 have been lost on their transmission to us from San Francisco, and no second copy can be obtained in the libraries accessible to us. However, we hope to insert the remaining species in the Record of next year.

paid particular attention to those fishes which are supposed to be hybrids between different Cyprinoids, and describes several new forms of them.

GÜNTHER, A. On some new species of Central American fishes. Proc. Zool. Soc. 1864, January 26 (pp. 23-27, with two plates).

This paper contains the description of a collection of 30 species sent by Captain Dow to the British Museum. The new species will be mentioned below.

GÜNTHER, A. Report on a collection of fishes made by Messrs. Dow, Godman, and Salvin in Guatemala. Proc. Zool. Soc. 1864, March 22 (pp. 144-154).

This is the first part of preliminary descriptions of the new species contained in various collections made by the gentlemen mentioned, in Guatemala and other parts of Central America, and deposited in the British Museum. A more detailed account of the collections, with a complete list of the species, is reserved for the Transactions of the Society.

GÜNTHER, A. On a poison-organ in a genus of Batrachoid fishes. Proc. Zool. Soc. 1864, March 22 (pp. 155-158, with a woodcut).

STEINDACHNER, F. Beiträge zur Kenntniss der Chromiden Mejico's und Central-America's. Denkschr. Acad. Wiss. Wien, 1864, xxiii. pp. 18, with 5 plates.

STEINDACHNER, F. Ichthyologische Notizen. Sitzgsber. Acad. Wiss. Wien, 1864, xlix. February (pp. 200-214, with two plates).

STEINDACHNER, F. Ichthyologische Mittheilungen (vii.). Verh. Zool. Bot. Ges. Wien, 1864, April 6 (pp. 223-232, with two plates).

MITCHELL, J. On the climbing habits of *Anabas scandens*. Ann. & Mag. Nat. Hist. 1864, xiii. February, pp. 117-119; and June, p. 523.

GILL, TH. Note on the nomenclature of genera and species of the family *Echeneidoidæ*. Proc. Acad. Nat. Sc. Philad. 1864, March (pp. 59-61).

MARTENS, E. v. Ueber eine neue Art von Rochen, *Trygonoptera javanica*. Monatsber. Acad. Wiss. Berlin, 1864, April 18 (pp. 260-264).

KREFFT, G. Notes on Australian freshwater fishes, and descriptions of four new species. Proc. Zool. Soc. 1864, April 26 (pp. 182-184).

The author says that the fresh waters in the neighbourhood of

Sydney are inhabited by only a limited number of fishes; he found *Eleotris australis*, sp. n., *Mugil dobula*, *Anguilla australis*, and *Galaxias scribea*. The species are more numerous in the Hawkesbury River, where he obtained, beside the species mentioned, a second species of Grey Mullet (*M. compressus*), *Lates colonorum*, *Centropogon robustus*, *Platycephalus tasmanius*, two species of *Eleotris*, and *Megalops setipinnis*.

GÜNTHER, A. On a new generic type of fishes (*Scleropages*) discovered by the late Dr. Leichardt in Queensland. Ann. & Mag. Nat. Hist. 1864, xiv. September (pp. 195-197, with a plate).

WIDEGREN, H. Nya bidrag till Kännedomen om Sveriges Salmonider. Öfvers. Vet. Akad. Förhandl. 1864, May 11 (pp. 279-305, with 7 plates).

CANESTRINI, G. Note ittologiche. Arch. per la Zool. Anat. Fisiol. 1864, May (pp. 100-112).

CANESTRINI, G. Studi sui *Lepadogaster* del Mediterraneo. Arch. per la Zool. Anat. Fisiol. 1864, May (pp. 177-196, with a plate).

KNER, R. Specielles Verzeichniss der während der Reise der Kaiserl. Fregatte "Novara" gesammelten Fische. Sitzsber. Acad. Wiss. Wien, 1864, xlix. May (pp. 481-486).

The author has commenced a report on the fishes collected during the expedition of the Austrian frigate "Novara." This first part contains an enumeration of the species belonging to the families *Berycidae*, *Percidae*, *Pristipomatidae*, *Mullidae*, *Sparidae*, and *Squamipinnes*. Five are considered to be new.

GILL, TH. Critical remarks on the genera *Sebastes* and *Sebastodes* of Ayres. Proc. Acad. Nat. Sc. Philad. 1864, May (pp. 145-147).

GILL, TH. Second contribution to the Selachology of California. Proc. Acad. Nat. Sc. Philad. 1864, May (pp. 147-151).

GILL, TH. Synopsis of the Eastern American Sharks. Ibid. November (pp. 258-265).

The author enumerates 18 species, adding the synonymy to each, as far as it was possible in the present imperfect state of our knowledge of the American Sharks. Also a synopsis, showing the systematic arrangement of the groups adopted by the author, is given.

BOCAGE, J. V. B. du. Sur quelques espèces inédites de *Squalidae* de la tribu *Acanthiana* (Gray), qui fréquentent les côtes du

Portugal. Proc. Zool. Soc. 1864, June 14 (pp. 260-263, with woodcuts).

PETERS, W. Ueber einige neue Fische. Monatsber. Acad. Wiss. Berl. 1864, June 20 (p. 381).

GÜNTHER, A. On a new genus of Pediculate fish from the Sea of Madeira. Proc. Zool. Soc. 1864, June 28 (pp. 301-303, with a plate).

GÜNTHER, A. Report on a collection of fishes made by Dr. Kirk in the Zambesi and Nyassa Regions. Proc. Zool. Soc. 1864, June 28 (p. 303).

The paper includes an account of the topographical features of the country explored by Dr. Kirk. The list comprises 30 species, of which those collected on Lake Nyassa are the most interesting, all being new and belonging to the Chromides and Cyprinoids.

GÜNTHER, A. Report on a collection of fishes from Palestine. Proc. Zool. Soc. 1864, November 8 (p. 488).

Mr. Tristram's collection mentioned above (p. 103) contained 19 species of fishes from the Jordan and the Lake of Galilee, three of them being undescribed. Remarkable is the presence of a Blenny, and of four or five species of *Chromis* and *Hemichromis*; nine are Cyprinoids. The fish-fauna of the Jordan is a mixture of African and Asiatic forms. The Dead Sea is inhabited by fish at the entrance of rivers and streamlets only.

COPE, E. D. Partial Catalogue of the Cold-blooded Vertebrata of Michigan. Part I. Proc. Acad. Nat. Sc. Philad. 1864, December (pp. 276-285).

BLEEKER, P. Notices sur quelques genres et espèces de Cyprinoides de Chine. Nederl. Tydschr. Dierk. 1864, pp. 18-29.

BLEEKER, P. Notice sur les poissons envoyés de Chine au Musée de Leide par M. G. Schlegel. Nederl. Tydschr. Dierk. 1864, pp. 55-62.

BLEEKER, P. Notice sur quelques poissons de la Baie de Manille. Nederl. Tydschr. Dierk. 1864 (pp. 30-32).

This is a list of 26 species from that locality, one of which is new.

BLEEKER, P. Notice sur la faune ichthyologique de Siam. Versl. en Mededeel. Acad. Wet. Amsterd. 1864, xvi. pp. 352-358, with a plate.

BLEEKER, P. Nouvelle notice sur la faune ichthyologique de

Siam. Nederl. Tydschr. Dierk. 1864, pp. 35-37. And a "Sixième notice," *ibid.* pp. 167-176.

These are merely lists of names of species, 177 in number.

BLEEKER, P. Poissons inédits Indo-Archipélagiques de l'ordre des Murènes. Nederl. Tydschr. Dierk. 1864, pp. 38-54.

BLEEKER, P. Systema Murænorum revisum. Nederl. Tydschr. Dierk. 1864, pp. 113-122.

BLEEKER, P. Synonyma Murænorum Indo-Archipelagicorum hucusque observatorum revisa, adjectis habitationibus citationibusque ubi descriptiones figuræque eorum recentiores reperiuntur. *Ibid.* pp. 123-136.

BLEEKER, P. Notice sur quelques poissons de l'île de Harouko. Nederl. Tydschr. Dierk. 1864, pp. 63-64.

A list of the names of 24 species, obtained near a small island between Amboyna and Saparoua.

BLEEKER, P. Quatrième notice sur la faune ichthyologique de l'île de Bouro. Nederl. Tydschr. Dierk. 1864, p. 140.

A list of names of 337 species.

BLEEKER, P. Description de quelques espèces inédites de poissons de l'Archipel des Moluques. Nederl. Tydschr. Dierk. 1864, pp. 177-181.

BLEEKER, P. Énumération des espèces de poissons actuellement connues de l'île de Céram. Nederl. Tydschr. Dierk. 1864, pp. 182-193.

A list of names of 394 species.

BLEEKER, P. Deuxième notice sur la faune ichthyologique de l'île de Saparoua. Versl. en Mededeel. Akad. Wet. Amsterd. 1864, xvi. pp. 359-361.

A list of names of 37 species.—In the same journal similar lists are given of the island of Grand Key (6 species), of that of Noussa-Laut (19 species), and of the Arou Islands (47 species).

BLEEKER, P. Notice sur une nouvelle espèce de *Xiphasia*. Nederl. Tydschr. Dierk. 1864, pp. 194-196.

This is a reprint from the 17th vol. of Versl. en Mededeel. Akad. Wet. Amsterd., which will be published in 1865.

BLEEKER, P. Description de quelques espèces de Cobitoïdes et de Cyprinoïdes de Ceylan. Natuurk. Verhandl. Holl. Maatsch. Wet. Haarlem, 1864 (pp. 22, with four plates).

BLEEKER, P. Description des espèces de Silures de Suriname,

conservées aux musées de Leide et d'Amsterdam. *Natuurk. Verhandl. Holl. Maatsch. Wet. Haarlem*, 1864 (pp. 104, with 16 coloured plates).

This paper contains descriptions of 45 species from Dutch Guiana, found in the Dutch collections. Although all have been previously described, yet the paper is valuable, inasmuch as several species which were imperfectly known are illustrated by very good figures.

WINCHELL, A. Description of a Gar-pike, supposed to be new, *Lepidosteus (Cylindrosteus) oculatus*. *Proc. Acad. Nat. Sc. Philad.* 1864, August (pp. 183-185).

GILL, TH. Note on the Paralepidoids and Microstomatoids, and on some Peculiarities of Arctic Ichthyology. *Proc. Acad. Nat. Sc. Philad.* 1864, September (pp. 187-189).

GILL, TH. Synopsis of the Cyclopteroids of Eastern North America. *Ibid.* (pp. 189-194).

The author enumerates 8 species, one of which is described as new.

GILL, TH. Synopsis of the Pleuronectoids of California and North-Western America. *Ibid.* (pp. 194-199).

This synopsis is an enumeration of 17 species, one of which is new; they are referred to 12 genera, which are shortly characterized.

GILL, TH. On the affinities of several doubtful British Fishes. *Proc. Acad. Nat. Sc. Philad.* 1864, September (pp. 199-208).

GILL, TH. Note on the family of Stichæoids. *Ibid.* (pp. 208-210).

GILL, TH. Synopsis of the Pleuronectoids of the Eastern coast of North America. *Ibid.* October (pp. 214-224).

The author enumerates 16 species, which he refers to 14 genera as restricted by him. Of two only, which are new, descriptions are given. The American species are but imperfectly known, owing to the deficient descriptions of previous authors; and Mr. Gill would much advance Ichthyology by giving us serviceable descriptions, instead of limiting himself to synoptical tables with minute pseudo-generic subdivisions. As regards his frequent critical remarks on synonyms, it would be very useful if he would state whether he arrived at his conclusions from an examination of the typical specimens; but frequently it is not even evident whether he has known the species from autopsy.

COPE, E. D. On a Blind Silurid, from Pennsylvania. *Proc. Acad. Nat. Sc. Philad.* 1864, October (pp. 231-233).

GUICHENOT, A. Faune ichthyologique, in Notes sur l'île de la Réunion, par L. Maillard. Paris, 8vo (pp. 32).

In an appendix to the work mentioned, M. Guichenot has given a list of the species occurring in the sea round the island of Bourbon; it is compiled from Cuvier and Valenciennes's Hist. Nat. des Poissons, but comprises several other species, which are considered to be new and are described.

STRÜVER, J. Beschreibung des *Heterodontus philippii*, Bl. (*Cestracion philippii*, Cuv.). Nov. Act. Acad. Carol. Leop. xxiii. 1864 (pp. 32, with two plates).

KRAUSS, F. Ueber einen lebenden Lungenfisch (*Lepidosiren annectens*). Würtemb. ntrwiss. Jahresh. 1864 (pp. 126-133).

KLEIN. Beiträge zur Anatomie der *Lepidosiren annectens*. Ibid. (pp. 134-144).

BYSTRÖM, C. Om Fiskodlingen i åtskilliga fremmande länder. Öfvers. Svensk. Vetensk. Akad. Förhandl. 1864 (pp. 305-342).

The author gives a report on various piscicultural establishments which he has visited on a journey through Germany, Switzerland, and France.

WYMAN, J. Observations on the development of *Raja batis*. Mem. Amer. Acad. 1864, ix. pp. 31-44, with a plate.

MARCUSEN, J. Sur l'anatomie et l'histologie du *Branchiostoma lubricum*. Compt. rend. Acad. Sc. Paris, 1864, March 7 (pp. 479-483); and July 11 (pp. 89-90). Translated in Ann. & Mag. Nat. Hist. 1864, xiv. pp. 151 & 319.

HYRTL, J. Ueber das Verhalten der Leberarterie zur Pfortader bei Amphibien und Fischen. Sitzgsber. Acad. Wiss. Wien, 1864, January (pp. 167-175, with a plate).

[On the relation of the hepatic artery to the portal vein in Amphibians and Fishes.]

HYRTL, J. Ueber eine Eigenthümlichkeit des Schlundes von *Catla buechanani*. Sitzgsber. Acad. Wiss. Wien, 1864, vol. 49, January (pp. 161-166, with a plate).

[On the peculiar structure of the pharynx of *Catla buechanani*.]

HYRTL, J. Ueber die Einmündung des *Ductus choledochus* in eine *Appendix pylorica*. Sitzgsber. Acad. Wiss. Wien, 1864, vol. 50, June (pp. 39-41, with a plate).

The ductus choledochus enters normally a pyloric appendage 1864. [VOL. I.]

in *Fistularia*, *Aulostoma*, *Acanthurus*, *Otolithus*, and *Hemitripterus*.

KNER, R. Einiges über die Thymusdrüse bei Fischen und die Schwimmblase der Stachelflosser. Sitzgsber. Acad. Wiss. Wien, 1864, xlix. May (pp. 455-459).

The author remarks that in several fishes which are provided with Pori pectorales, the thymus gland is absent, and that the air-bladder communicates with the œsophagus by an open duct in several Acanthopterygians (*Holocentrum*, *Priacanthus*, *Cæcio*).

MÜLLER, H. Bemerkungen über die Epidermis von *Petromyzon*. Würzb. ntrwiss. Zeitschr. 1864, v. pp. 43-53.

[Remarks on the epidermis of *Petromyzon*.]

OFJSJANNIKOF, PH. Ueber die Inauguraldissertation des Herrn Dr. Kutschin das Rückenmark der Neunaugen betreffend, nebst einigen eigenen Beobachtungen über das Rückenmark der Knochenfische und anderer Thiere. Bull. Acad. Sc. St. Pétersb. vii. 1864 (pp. 137-145).

[Researches on the spinal marrow of Teleosteous fishes and of other animals, with remarks on Dr. Kutschin's Researches on the spinal marrow of the Lamprey.]

OFJSJANNIKOF, PH. Ueber die feine Structur des Kleinhirns der Fische. Bull. Acad. Sc. St. Pétersb. vii. 1864, pp. 157-166.
[On the minute structure of the cerebellum of Fishes.]

MOREAU, A. Sur la voix des poissons. Compt. rend. Acad. Sc. Paris, 1864, August 29 (p. 436).

The interesting observations made by the author refer to *Trigla hirundo*, and will be recorded below.

KÖLLIKER, A. Weitere Beobachtungen über die Wirbel der Selachier, insbesondere über die Wirbel der Lamnoidei, nebst allgemeinen Bemerkungen über die Bildung der Wirbel der Plagiostomen. Abhandl. Senckenb. Naturf. Gesellsch. 1864, v. pp. 51-99, with five plates.

[Further observations on the vertebræ of Selachians, especially on the vertebræ of the *Lamnoidei*, with general remarks on the formation of the vertebræ of Plagiostomes.]

LOTZ, TH. Ueber den Bau der Schwanzwirbelsäule der Salmoniden, Cyprinoiden, Percoiden und Cataphracten. Sieb. u. Köllik. Zeitschr. wiss. Zool. 1864, June 20 (pp. 81-106, with four plates).

The author has examined the termination of the caudal vertebral column of the adult state of *Salmo salar*, *Salmo fario*, *Thymallus vexillifer*, *Barbus fluviatilis*, *Cottus gobio*, *Gasterosteus aculeatus*, and *Perca fluviatilis*; and having traced the deve-

lopment of this part in *Salmo salar* from the first day of its being hatched, he concludes his paper by pointing out the nature of the several elements constituting the end of the vertebral column.

LEREBoullet, A. Recherches sur les monstruosités du Brochet observées dans l'œuf et sur leur mode de production. Ann. Sc. Nat. 1864, i. February to May (pp. 113-193, 257-320).

Monstrosities of the embryos of the Pike are of common occurrence; they are either double, produced by a superabundance of the plastic embryonic matter, or simple, one individual being partially or wholly defective. The author has proved, by a long series of experiments, that the disposition to monstrosity is inherent in the ovum, and that it is entirely independent of external influences; however, it would appear that the latter, whether physical or mechanical, may sometimes be the cause of an arrest of development of the whole individual or of some part of it.

HALBERTSMA, H. J. Normaal en abnormaal Hermaphroditismus by de Visschen. Versl. en Mededeel. Akad. Wet. Amsterd. 1864, xvi. pp. 165-178, with a plate.

The author recapitulates the cases of hermaphroditism observed in fishes. He distinguishes two kinds: 1. The normal hermaphroditism is symmetrical; that is, a testis is developed between the membranes of each half of the ovary, and each half of the primitive double embryonal gland (Kiemklier) is metamorphosed into a testis and ovary. This is the case in the *Serrani* of the Mediterranean. 2. The abnormal hermaphroditism is asymmetrical, and found on one side only; the testis and ovary are separate bodies, and the halves of the embryonal gland are never metamorphosed into testis and ovary on both sides of the same individual. Such hermaphrodites have been observed in the Carp, Cod, Perch, *Melanurus* (probably *Oblata melanura*), *Acipenser huso*, Pike, and *Gadus merlangus*.—An hermaphroditic Perch is figured.

M'DONNELL, R. On the system of the "Lateral line" in fishes. Trans. Roy. Irish Acad. vol. xxiv. 1864 (read 1862, May 26, pp. 161-187, with four plates).

The author describes and figures in this memoir the "system of the lateral line" of various British fishes (*Raja*, *Carcharias*, *Squalus*, *Chimæra*, *Acipenser*, *Pagellus*, *Mugil*, *Syngnathus*, *Acerina*, *Lampris*, *Anguilla*, *Platessa*, *Esox*, *Petromyzon*), and of *Lepidosiren*. He rejects Vogt's view, that it is only a system of absorbent vessels, containing lymph, and water forced in from without, and Geoffroy St.-Hilaire's opinion, who considered it to be related homologically or otherwise to the electric organs.

As regards Leydig's view that this system is an organization appertaining to special organs of touch, the author admits that, sometimes, it may be made secondarily subservient to this purpose; but its proper function is the secretion of some fluid which is poured forth from the skin as an excretion. However, it is certain, and has repeatedly been proved by direct experiments, that the slimy mucus which lubricates the body of many fishes is not formed by this system.—The presence of this system of the lateral line in *Lepidosiren annectens* is important for determining the position of this animal in the division of Vertebrata, as this organ is possessed by almost all fishes, and entirely absent in the Amphibians.

HOLLARD, H. Recherches sur la signification homologique de quelques pièces faciales des poissons osseux. Ann. Sc. Nat. 1864, i. January (pp. 5–19, with a plate).

HOLLARD, H. De la signification anatomique de l'appareil operculaire des poissons et de quelques autres parties de leur système solide. Ibid. April (pp. 241–256, with a plate).

HOLLARD, H. Du temporal et des pièces qui en représentent les éléments dans la série des animaux vertébrés. Ibid. June (pp. 359–376, with a plate). Abstract in Compt. rend. Acad. Sc. Paris, 1864, i. March 21 (p. 528).

Professor Hollard has published a series of papers, in which he gives the result of his most exact researches into the development and homologies of the bones between the temporal region and the mandible, especially as they appear in the class of fishes. He deduces his homological interpretations entirely from the development of the different pieces; and their correctness will depend on the question whether development is a sure test for homologies or not.

In the first paper, Ann. Sc. Nat. 1864, i. p. 5, he examines that group of bones of fishes which are comprised under the names of mandibular suspension, and temporo-maxillary or tympanic group. He shows (in embryos of some Salmonoid) that the five bones composing that group [*os temporale* (Cuv.), *os symplecticum* (Cuv.), *os jugale* (Cuv.), *os tympanicum* (Cuv.), *præoperculum*] are formed out of two primordial cartilages. The anterior serves for the suspension of the mandible, and is the base for the formation of two of the bones named, *os jugale* and *os tympanicum*, which consequently are the homologues of the *os quadratum* of Birds. The posterior serves for the suspension of a complex hyoid arch and for the attachment of the opercular apparatus, and is therefore the homologue of a much developed styloid bone, which is composed of three distinct pieces, viz., *præoperculum*, *os symplecticum*, and *os temporale* (Cuv.). But when we consider Cuvier's *temporale* as a part of the styloid bone, it follows that it is not homologous to the

temporal of the higher animals. Therefore the author adopts the view of other anatomists, that Cuvier's mastoid bone is the true temporal.

The subject of the second memoir (Ann. Sc. Nat. 1864, i. p. 241) is the opercular apparatus. The interoperculum is a part of the neuro-skeleton, whilst the operculum and suboperculum belong to the dermo-skeleton. The author directs our attention to the fact that the interoperculum is constantly in close connexion with the mandible, and that when the opercular pieces are more or less disconnected from one another or from other bones of the skull, as in *Lophius piscatorius*, the interopercle continues to be attached to the mandible. Hence he formerly came to the conclusion that this bone is the termination of the cartilage of Meckel, or homologous to the *malleus*; but since by other researches it has been proved that that cartilage becomes entirely surrounded by, and terminates with, the mandibular bone, it is more probable that it is homologous to the *incus*.—The opercle and subopercle are considered analogous to the branchiostegals.

In the third memoir, on the temporal bone (Ann. Sc. Nat. 1864, i. p. 359), the author extends his researches over all the classes of Vertebrata, and starts some quite novel views:—The temporal bone of the fetus of Mammals is composed of four elements, viz., the petrosal, squamosal, the tympanic frame (cadre), and the tympanic drum, whilst the mastoid, which has generally been considered a distinct bone, is merely the outermost part of the petrosal. The squamosal has been recognized in Birds by Cuvier and most other anatomists, but not so in Reptiles and Fishes, in which it was taken for a mastoid; Amphibians have no squamosal. The tympanic frame of Mammals becomes the os quadratum of Birds and Reptiles; the drum becomes a first segment of the zygomatic arch in these two classes, whilst in Amphibians and Fishes it is gradually transformed into the elements for the articulation of the mandible. Finally, the petrosal loses more and more its character as a complete external covering of the labyrinth in the series of air-breathing oviparous animals, until, in the Fishes, it disappears entirely, the labyrinth being non-ossified and placed in the interior of the skull.

D. Publications of a Popular Character.

The Salmon. By ALEX. RUSSEL. Edinb. 1864. 8vo, pp. 248.

The object of the book is to put clearly before the public the commercial importance of this fish, to review Salmon legislation of the past, and to discuss that of the future. Although we cannot enter here into the details of this work, we would not lose this opportunity of adding our testimony as to the excellent manner in which the author has treated the Natural History of the Salmon, giving a clear and precise account of its development according to the investigations made in this country by various naturalists.

The Herring; its Natural History and National Importance. By JOHN M. MITCHELL. Edinb. 1864. 8vo, pp. 372, with Illustrations.

This work contains a very detailed account of the habits of

the Herring, of its geographical distribution and periodical visits in the different parts of the northern hemisphere. A second part is devoted to the different modes of fishing and curing, and a third to the chronological history of the Herring-fishery.

The Fisherman's Magazine and Review. Edited by CH. PENNELL
London: Chapman and Hall. 8vo.

This Journal has entered the second year of its existence, being regularly issued in monthly parts; each part consists of about four sheets and one coloured plate. It has devoted itself chiefly to fishery-legislation, pisciculture, practical fishing, popular descriptions of fishes, reviews of fishing-books, &c.

The number of species of Fishes known is more than 8000, according to Van der Hoeven, Philos. Zool. p. 330, nearly equally divided between fresh- and salt-water (p. 359). But in the European fauna the ratio between freshwater and marine species is as 1 : 3. The Acanthopterygians would form more than one-half of the total number, the Malacopterygians nearly one-third, the Desmiobranchians $\frac{1}{26}$ th, the Plectognaths $\frac{1}{32}$ nd.

DIPNOI.

Lepidosiren annectens. Prof. Krauss makes some remarks on a living specimen; it fed on *Gammari* and *Dytisci*, but would not touch fish. Dr. v. Klein adds his observations on the anatomy, and especially on the skeleton of the same specimen. Würtemb. ntrwiss. Jahresh. 1864, pp. 126-144.

PERCIDÆ.

Acerina rossica (C. & V.). Prof. Kner has received specimens from the Dnjester, which he determines as this species. Verh. Zool.-Bot. Ges. 1864, p. 75. Dr. Steindachner (ibid. p. 231) states that this species is, without the least doubt, a variation of colour of *A. schretzer*. Whatever those specimens may be, *A. rossica* (C. & V.) cannot be considered synonymous with *A. schretzer*, unless it can be shown, by an examination of the typical specimens of *A. rossica*, that Cuvier's statement of 55 scales in the lateral line is erroneous.

Plectroperca berendtii, Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 121, from Japan [is identical with *Siniperca chuatsi*, Basil. Nouv. Mém. Soc. Nat. Mosc. 1855, x. p. 218.]

Etheostoma peltatum (Stauffer), sp. n., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 232, from the Conestoga, Pennsylvania.

Pacilichthys mesæus, sp. n., Cope, l. c., from the Platte River, Nebraska.

Hololepis erochrous, sp. n., Cope, l. c., from streams near Philadelphia.

Centropomus medius, sp. n., and *C. nigrescens*, sp. n., Günther, Proc. Zool. Soc. 1864, p. 144, both from Chiapam; *Centropomus brevis*, sp. n., Günther, l. c. p. 145, from Tropical America; *Centropomus affinis*, sp. n., Steindachner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 200. taf. 1. fig. 1, from Rio Janeiro.

Centropristis macropoma, sp. n., Günther, Proc. Zool. Soc. 1864, p. 145, from the Pacific Coast of Panama.

Serranus longispinis, from Madras, and *Serranus novemcinctus*, from the Cape of Good Hope, sp. n., Kner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 483.

Serranus angustifrons, sp. n.?, Steindachner, Verh. Zool.-Bot. Ges. Wien, 1864, p. 230, taf. 7. figs. 2-3, from Cuba. D. $\frac{11}{17}$. A. $\frac{3}{8}$. [This is not *Serranus oncus* (Bl.), which has proved to be an Indian species.]

Grystes lunulatus, sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 4.—D. 10 | 11. A. $\frac{3}{8}$; a notch between spinous and soft dorsal fins; body with small, black, crescent-shaped spots.—Bourbon. [According to the views of modern ichthyologists the genus *Grystes* is restricted to the American freshwater species, and therefore we doubt whether M. Guichenot has assigned the proper position to this species.]

Mesoprion aratus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 145, from Guatemala and Panama.—*Mesoprion griseoides*, sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 2.—Bourbon.

Apogon maculiferus, sp. n., Garrett, Proc. Calif. Acad. Nat. Sc. iii. p. 105, from the Sandwich Islands. D. 7 | $\frac{1}{9}$. A. $\frac{2}{5}$. L. lat. 24. With longitudinal rows of small olivaceous spots.

Ambassis robustus (Günth.) is redescribed and figured by Steindachner, in Arch. per la Zool. 1864, p. 197, tav. 4. fig. 1.

Glyphodes, g. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 3. This genus would appear to be intermediate between *Percidæ* and *Sparidæ* [if its characters be correctly defined, and if it does not belong to the Pharyngognaths]. M. Guichenot places it in the Percoids: Teeth in a single series in both jaws, flattened and notched at the tip; vomerine and palatine teeth present, villiform. Præoperculum smooth, not serrated; operculum terminating in two points. *Glyphodes aprionoides*: D. $\frac{10}{11}$. A. $\frac{3}{8}$; the height of the body is one-fifth of the total length.—Bourbon. [If the genus be valid, its name must be altered.]

Odontonectes. Dr. Bleeker states that this genus has been erroneously separated from *Cæcio*, but without giving any reason for this opinion. Therefore, for the present, we shall retain it. Nederl. Tydschr. Dierk. 1864, p. 181.

PRISTIPOMATIDÆ.

Therapon percoides, sp. n., Günther, Ann. & Mag. Nat. Hist. 1864, xiv. p. 374, from Queensland.

(*Therapon*.) *Datnia plumbea*, sp. n., Kner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 484, from the Cape of Good Hope and from St. Paul.

Pristipoma brasiliense (Steind.) proves to be identical with *P. bicolor* (Casteln.). Steindachner, Verh. Zool.-Bot. Ges. Wien, 1864, p. 231.

Pristipoma dovii, sp. n., Günther, Proc. Zool. Soc. 1864, p. 23, pl. 3. fig. 1, from the Pacific coast of Panama; *Pristipoma chalcum*, Günther, *ibid.*, p. 146, from the Pacific coast of Panama; *P. macracanthum*, Günther, *ibid.*, and *P. leuciscus*, Günther, p. 147, from Guatemala.

Conodon pacifici, sp. n., Günther, Proc. Zool. Soc. 1864, p. 147, from Chiapam.
Hæmulon margaritifera, Günther, Proc. Zool. Soc. 1864, p. 147, from the Pacific coast of Panama.

Diagramma citrinellum, sp. n., Günther, Ann. & Mag. Nat. Hist. 1864, xiv. p. 374, from the Cape de Verde Islands.

Heterognathodon petersii, sp. n., Steindachner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 203, taf. 1. fig. 2, from Zanzibar.

Pentapus curtus, sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 5.—Bourbon. D. $\frac{10}{10}$. A. $\frac{3}{10}$; the height of the body is one-third of the total length.

Cæcio digramma, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 180, from Amboyna.

SQUAMIPINNES.

Chatodon melapterus, sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 6.—Bourbon. D. $\frac{13}{22}$. A. $\frac{3}{22}$.

Chatodon multicinctus, sp. n., Garrett, Proc. Calif. Acad. Nat. Sc. iii. (1863, November) p. 65, from the Sandwich Islands. [This species appears to be allied to *Ch. robustus*, Gthr.] D. $\frac{13}{24}$. A. $\frac{3}{19}$. Scales of moderate size*. Creamy-yellow, sides with five vertical yellowish-brown diffuse stripes. Ocular fascia brown above and yellow beneath the eye. A vertical black stripe marks the middle of the caudal trunk. Caudal colourless; ventrals whitish.

NANDIDÆ.

Catopra malabarica, sp. n., Günther, Ann. & Mag. Nat. Hist. 1864, xiv. p. 375, from the Malabar Coast.

MULLIDÆ.

Upeneus tetraspilus, Günther, Proc. Zool. Soc. 1864, p. 148, from the Pacific coast of Panama.

SPARIDÆ.

Pimelepterus altipinnoides (!), sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 7, from Bourbon.

CIRRHITIDÆ.

Chilodactylus vittatus, sp. n., Garrett, Proc. Calif. Acad. Nat. Sc. iii. p. 103, from the Sandwich Islands. D. $\frac{17}{30}$. A. $\frac{3}{8}$. Six simple pectoral rays, the second extending as far back as the vent. The fourth dorsal spine longest, one-third as long as the base of the whole fin. Greyish-silvery, with five oblique blackish-brown bands: the first from the snout to the præopercular margin; the second from the eye to the base of the pectoral; the third from

* Mr. Garrett would add an important character in the descriptions of his species if he would state the number of scales in, above, and below the lateral line.

the occiput to the axil; the fifth from the upper anterior half of the spinous dorsal, extending along the back to near the termination of that fin.

Mendosoma elongatum, sp. n., Kner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 485, from St. Paul.

SCORPÆNIDÆ.

Sebastes. Mr. Gill states that *Sebastes helvomaculatus* (Ayres) is identical with *S. rosaceus* (Girard), and that therefore *S. rosaceus* (Ayres) must receive a new name, viz. *Sebastosomus pinniger* (Gill); that under the name of *S. melanops* Girard has confounded two species, one of which is to be called *Sebastosomus simulans* (Gill); and, finally, that *S. rosaceus* (Girard) is the type of another genus, *Sebastomus*. Proc. Acad. Nat. Sc. Philad. 1864, p. 145.

Sebastes meleagris, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 392, from the Red Sea.

Scorpena parvipinnis, sp. n., Garrett, Proc. Calif. Acad. Nat. Sc. iii. p. 105, from the Sandwich Islands. D. $\frac{13}{12}$. A. $\frac{3}{5}$. Head scaly; dorsal and anal fins small; posterior half of the body dusky black, fading into pink beneath, dotted with darker; free portion of the tail pink.

Centropogon robustus (Gthr.) is found far up the rivers, between the mountains. Krefft, Proc. Zool. Soc. 1864, p. 182.

Paraploactis is described as a new genus by Dr. Bleeker, Nederl. Tydschr. Dierk. 1864, p. 168; it is distinguished from *Aploactis* by the total absence of teeth on the palate.—*P. trachyderma*, sp. n., p. 169, from Australia. D. $3 \frac{10}{11}$. A. $\frac{1}{9}$.

BERYCIDÆ.

Holocentrum tahiticum, sp. n., Kner, Sitzgsber. Acad. Wiss. Wien. 1864, xxix. p. 482, from Otaheiti.

Metopias typhlops (Lowe) proves to be a Berycoid fish; the generic name being preoccupied, Dr. Günther proposes that of *Melamphaes* for it. Fish. v. p. 433.

POLYNEMIDÆ.

Polynemus melanopoma, sp. n., Günther, Proc. Zool. Soc. 1864, p. 148, from Guatemala.

SCIÆNIDÆ.

Micropogon. Dr. Steindachner believes he has recognized *Corrina biloba* (C. & V.); the fish so determined by him has three minute barbels, and therefore is named *Pachypops biloba*; it is from Surinam. Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 206.

Micropogon altipinnis, sp. n., Günther, Proc. Zool. Soc. 1864, p. 149, from Guatemala.

Umbrina elongata, sp. n., Günther, Proc. Zool. Soc. 1864, p. 148, from Chiapam.

Pachyurus nattereri (Steind.) is probably identical with *P. lundii* (Rnhrdt). Steindachner, Verh. Zool.-Bot. Ges. Wien, 1864, p. 231.

Corrina stellifera (Gthr.) = *Bodianus stellifer* (Bl.) = *Corrina trispinosa* (C. & V.). Dr. Steindachner prefers to give a new name (*C. microps*) to this

species, because it has a smaller eye than is represented by Bloch. However, it is more probable that the eye has been figured too large by Bloch, and that the species proposed by Dr. Steindachner is synonymous with *C. stellifera*. Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 205, taf. 2. fig. 2. He is correct in his statement that this species has pseudobranchiæ, although they are very thin.

Otolithus albus, sp. n., and *O. reticulatus*, sp. n., Günther, Proc. Zool. Soc. 1864, p. 149, both from Guatemala.

TRICHIURIDÆ.

Trichiurus lepturus. Mr. Gill has critically examined the account given by Hoy of two fishes which he identified with *T. lepturus* (L.). Like Dr. Fleming he comes to the conclusion that Hoy's first specimen was a much injured example of *Trachypterus*; and in the second he has recognized a Cuban fish, lately discovered by Prof. Poey—*Euxymetopon tæniatus*. Proc. Acad. Nat. Sc. Philad. 1864, p. 205.

ACRONURIDÆ.

Acanthurus gahmoides, sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 8, from Bourbon. D. $\frac{9}{27}$. A. $\frac{3}{26}$.

CARANGIDÆ.

Caranx leucurus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 24, from the Pacific coast of Panama.

Trachynotus glaucooides, sp. n., Günther, Proc. Zool. Soc. 1864, p. 150, from San José.

Pompheris schomburgkii (Müll. & Trosch.?) is described by Dr. Steindachner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 208.

CORYPHENIDÆ.

Pterycombus brama. Prof. Lilljeborg has examined this species, and given a detailed description of its external characters in the memoir mentioned above (p. 136); he also considers it closely related to *Brama*.

Brama longipinnis. Prof. Lilljeborg mentions, in his memoir on *Pterycombus*, that *Brama raschii* (Esmark) is identical with this species.

SCOMBRIDÆ.

Dr. Cooper describes and figures an *Orcynus pacificus* as a new species, Proc. Calif. Acad. Nat. Sc. iii. p. 75, fig. 19. Cuvier and Valenciennes have already described a *Thynnus pacificus* with long pectoral fins; and if the Californian species be distinct from it, it must receive another name.

Thynnus thunnina. Prof. Nilsson reports the occurrence of this species in the Scandinavian seas, and adds a description and figure. Æfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 499, taf. 5.

Auxis rochei. Prof. Nilsson reports the occurrence of this species in the Scandinavian seas, and adds a description and figure. Æfvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 500, taf. 6.

Echeneis. Mr. Gill divides the species of this genus into two groups and six genera, viz., *Remoreæ* with *Echeneis* (*E. remora*), *Remoropsis* (*E. brachyptera*), *Rhombochirus* (*E. osteochir*), *Remilegia* (*E. scutata*); and *Leptecheneides*

with *Leptecheneis* (*E. naucrates*) and *Phtheirichthys* (*E. lineatus*). In the same paper he expresses his opinion that *E. holbrookii* (Gthr.) should be named *E. albicauda* (Mitch.), and *E. scutata* (Gthr.) *E. australis* (Benn.). Proc. Acad. Nat. Sc. Philad. 1864, p. 59.

M. Guichenot, in Maillard, Notes sur l'île de la Réunion, App., describes three specimens of *Echeneis* from Bourbon under the names of *E. remeligo* (A. Dum.), p. 17, *E. borboniensis* (sp. n.), p. 19, and *E. lophioides* (sp. n.), p. 20. [The two former are probably *E. remora*, and the third does not appear to differ essentially from *E. clypeata*.]

TRACHINIDÆ.

Latilus. Dr. Cooper describes a fish from the coast of California, belonging to this genus, under the name of *Dekaya anomala*. Proc. Calif. Acad. Nat. Sc. iii. p. 70, fig. 17. It is very similar to *Latilus princeps* (Jenyns), and its differences from this species will have to be pointed out. It has seven dorsal spines.

Sillago schomburgkii, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 391, from Adelaide.

BATRACHIDÆ.

Thalassophryne. Dr. Günther has described a second species of this genus, *Th. reticulata*, from the Pacific Coast of Panama (Proc. Zool. Soc. 1864, p. 150). On examining this fish, he discovered a most singular apparatus, which structurally is as perfect a poison-organ as that of the venomous serpents; it is equally developed in both species, *Th. reticulata* and *Th. maculosa*. Each operculum terminates in a long spine similar to the two dorsal spines; each spine is perforated at the extremity and at the base, and has a canal in its interior. The canal leads into a sac at the base of each spine, in which a considerable quantity of the poisonous substance was found; on the slightest pressure it flowed freely from the opening of the spine. The sacs are not the secretory organ, but merely the reservoirs in which the fluid secreted accumulates. The author believes he has found evidence that the real organ of secretion is the system of muciferous channels, or at least some portion of it. Proc. Zool. Soc. 1864, p. 155.

Batrachus didactylus. Prof. Nilsson justly maintains that this species occasionally reaches the Scandinavian seas. (Efvers. Svensk. Vetensk. Akad. Förhandl. 1864, p. 502.)

PEDICULATI.

Melanocetus is a new genus of fish from the Sea of Madeira, discovered by Mr. Johnson, and described by Dr. Günther, Proc. Zool. Soc. 1864, p. 301. Head and gape of enormous size; body and tail short; belly pendent as a large, thin sac. Ventral fins none. Teeth of the jaws and palate long, pointed, unequal in size. *M. johnsonii*, pl. 25, a deep-sea fish, inhabiting the same horizontal marine zone as *Saccopharynx* and *Alepidosaurus*.

Antennarius leopardinus, Günther, Proc. Zool. Soc. 1864, p. 151, from the

Pacific coast of Panama; *Antennarius goramensis*, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 177; from Goram; *Antennarius lioderma*, sp. n., Bleeker, *ibid.*, p. 178, from Amboyna.

Chironectes niger, sp. n., Garrett, Proc. Calif. Acad. Nat. Sc. iii. p. 107, from the Sandwich Islands. Black; on the basal portion of the dorsal and anal fins may be observed two large ocellations, with deep-black pupils. Very minute opaque white points scattered along the lower parts. [Perhaps identical with *Antennarius melas*, Blkr.]

COTTIDÆ.

Trigla. M. Armand Moreau has shown, experimentally, that the sound produced by the Gurnards is under the influence of nerves; the experiments have been made on *Trigla hirundo*:—

The muscles of the air-bladder are transversely striated, and receive from the spinal marrow two thick nerves, the origin of which is below the pneumogastric nerves, close to that of the first dorsal pair. The mucous membrane of the air-bladder forms a kind of diaphragm which divides its interior into two cavities communicating with each other by a circular central foramen like that of the pupil. This diaphragm is thin and semitransparent, and contains radiating fibres and concentric circular fibres situated round the opening and forming a sphincter: both kinds of these muscular fibres are smooth, not striated. A similar arrangement is found in *Zeus faber*, in which the air-bladder receives its nerves from three spinal pairs.

M. Moreau divided by a transverse cut the spinal marrow of a Gurnard above the dorsal region, and having opened the abdominal cavity, and applied a feeble electric current to the nerves going to the air-bladder, he at once produced the characteristic sounds. He applied the same current to the muscles of the air-bladder, but without result; but after the intensity of the current had been increased, the sounds were heard again. He then cut off a part of the lower portion of the air-bladder so as to expose the diaphragm to view, and again galvanized the nerves; he very distinctly saw the diaphragm vibrating during the whole time of the application of the current, but no sound was produced under these circumstances. *Compt. Rend.* 1864, ii. p. 436.

Cottus gobio. Hr. Malmgren (*Wieg. Arch.* 1864, p. 272) denies that the rays of the ventral fins are forked in Scandinavian specimens. The Recorder has found them forked in specimens from the Gotha River (*Fish.* ii. p. 156). Therefore this character appears to vary.

Cottus quadricornis. According to Hr. Malmgren this species properly belongs to the Arctic fauna, extending from the White Sea along the northern shores of Asia and America to Melville Island and to the Coppermine River; it is found also in Lake Ladoga, in the Finnish Gulf, and in Lake Wetteren, but not in the southern parts of the Baltic, or in the German and Atlantic Oceans, except on the British coasts, where it has dragged on a miserable existence from the time of the Glacial period. Although the author has not had an opportunity of comparing British specimens with Finnish, he has reason to believe that the former are merely a degenerate variety of the Arctic type. *Wieg. Arch.* 1864, p. 276.

CATAPHRACTI.

Agonus decagonus. A single example has been found in the Warangerfjord (N. Scandinavia). Malmgren in Wieg. Arch. 1864, p. 280.

DISCOBOLI.

Liparis. The species of this genus are but imperfectly known, and there are considerable discrepancies in the descriptions given by various authors of species which they have designated by the same name. Mr. Gill has collected and examined what has been published of the species occurring on the Atlantic coasts of North America, and enumerates five species, one of which, although most closely allied to *L. fabricii*, is described as distinct—*L. arctica*. Proc. Acad. Nat. Sc. Philad. 1864, p. 191.

Two Finnish species are distinguished by Hr. Malmgren (Wieg. Arch. 1864, p. 287)—*Liparis barbatus* (Ekstr.) and *L. lineatus* (Lepechin), the former from the Glacial Ocean and Baltic, the latter from the White Sea only.

GOBIIDÆ.

Gobius melanostoma (Pall.), *G. fluviatilis* (Pall.), and *G. gymnotrachelus* (Kessl.) are redescribed by Prof. Kner, who received specimens from the Dnjester and Pruth. He considers *G. lacteus* (Nordm.) distinct from *G. fluviatilis*. Verh. Zool.-Bot. Ges. Wien, 1864, p. 76.

Gobius punctatissimus, sp. n., Canestr. Arch. per la Zool. 1864, p. 101, from fresh waters of Northern Italy.

Cotylopus, g. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 9. Similar to *Sicydium*, with a series of minute flexible teeth in the upper jaw, dilated and deeply notched at the tip; lower jaw with a single series of strong conical teeth*, without horizontal labial teeth. Body with scales of moderate size. *C. acutipinnis* (p. 10) and *C. parvipinnis* (p. 11), both from Bourbon.

Gillichthys†. Dr. Cooper has discovered a most interesting genus of Gobioid fish, which has the upper jaw produced backwards to the gill-opening, reminding us of *Opisthognathus* and *Neoclinus*. The gape of the mouth reaches only to below the hind margin of the eye. Ventrals united into a funnel-shaped disk; two separate dorsals. Villiform teeth in the jaws, none on the palate. Scales small and thin; lateral line none. *G. mirabilis*, fig. 24: D. 6 | 13. A. 11. Proc. Calif. Acad. Nat. Sc. iii. p. 109.

Eleotris seminudus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 24, pl. 4. fig. 2, from the Pacific Coast of Panama; *Eleotris longiceps*, sp. n., Günther, ibid. p. 151, from the Lake of Nicaragua; *Eleotris cozii*, *E. australis*, and *E. grandiceps*, Krefft, ibid. p. 183, all from New South Wales; *Eleotris compressus*, Krefft, ibid. p. 184, from the Clarence River.

Amblyopus brevis, sp. n., Günther, Proc. Zool. Soc. 1864, p. 151, from the Pacific coast of Panama.

* We suppose that, by a slip of the pen, M. Guichenot wrote *Cotylopus* instead of *Sicydium* in the ninth line of his description; otherwise the diagnosis would be quite incomprehensible.

† We hope Dr. Cooper will not continue to use this barbarous name, which is not worthy either of the author or of the man whom he intended to honour by it, but substitute for it a form more in accordance with the rules of nomenclature, like *Gillia*.

Callionymus papilio, sp. n., Gunther, Ann. & Mag. Nat. Hist. 1864, xiv. p. 197, from Melbourne.

BLENNIIDÆ.

Blennius lupulus (Bonap.). Dr. Günther considers the Blenny of the Jordan identical with this species. Proc. Zool. Soc. 1864, p. 490.

Xiphogadus. Dr. Bleeker has had the good fortune to rediscover the fish (or at least one closely allied to it) which was figured by Russell (i. pl. 33). It proves to be a Blenniod, near *Petroscirtes*. He considers it also possible that *Nemophis* of Kaup may be a fish allied to it. The characters of the genus would be:—Corpus alepidotum, maxime elongatum, anguilliforme, postice valde compressum. Pinnæ dorsalis, caudalis et analis unitæ; dorsalis radiis omnibus flexilibus capite antice, analis in anteriore septima corporis parte incipiens. Maxillæ antice dentibus conicis confertis subæqualibus, lateribus dente canino, inframaxillari maximo curvato. Palatum edentulum. Ossa suborbitalia scabra. Apertura branchialis angusta rimæformis, ante basin pectoralis desinens. Pinnæ ventrales graciles tiradiatæ ante aperturam branchialem insertæ. B. G.—Dr. Bleeker prefers to adopt the name of *Xiphasia* (!), and thinks that the fish observed by him may be specifically different from that figured by Russell; therefore he names it *Xiphasia trachypareia*. Nederl. Tydschr. Dierk. 1864, p. 194. The same paper will be republished in Versl. en Mededeel. Akad. Wet. Amsterd. xvii., where the species will be figured.

Myxodes elegans, sp. n., Cooper, Proc. Calif. Acad. Nat. Sc. iii. p. 108, fig. 23, from the coast of California. D. $\frac{32-35}{8}$. A. 26-28. L. lat. ca 250. The first five dorsal spines somewhat disconnected from the others. The author proposes provisionally the name *Gibbonsia*, if this species should prove to be the type of a distinct genus.

Cristiceps filifer, sp. n., Steindachner, Arch. per la Zool. 1864, p. 199, from the Philippine Islands.

Mr. Gill separates from this family the *Stichæoidæ* and *Cryptacanthoidæ* as two distinct families, distinguished by the development of cæca round the pylorus. The former would comprise *Centroblennius* (Gill), *Leptoblennius* (Gill), *Lumpenus*, *Anisarchus* (g. n., typ. spec. *Lumpenus medius*, Rnhrdt.), *Leptoclinus* (Gill), *Stichæus*, *Eumesogrammus* (g. n., typ. spec. *Stichæus præcisus*, Kröyer), and *Carelophus* (Kröyer). The author enumerates nine species as occurring on the Atlantic coast of America, which he refers to seven of the genera named. Proc. Acad. Nat. Sc. Philad. 1864, p. 208.

Centronotus gunellus. Mr. Gill has made a detailed investigation into the literature and history of *Ophidium imberbe*, in which he demonstrates that the fish described by Montagu under this name was a *Centronotus gunellus*, and the "*Beardless Ophidium*" of Pennant a young Eel. Proc. Acad. Nat. Sc. Philad. 1864, p. 200.

Dr. Günther (Proc. Zool. Soc. 1864, p. 26) has founded a new genus on a specimen from the Pacific coast of Panama, which is not in a perfect state

of preservation, so that he could not decide whether it should be referred to the Blennioids or Gadoids, or whether it is the type of a distinct family:—

Microdesmus. Body much elongate, eel-like, covered with rudimentary scales; head rather short, with obtuse snout, narrow cleft of the mouth, and prominent lower jaw. Eyes minute. Teeth in both jaws minute; palate toothless. The gill-opening is reduced to a small slit in front of the pectoral fin. Vertical fins united by a membrane, but the caudal can be easily distinguished from the two other fins. Dorsal fin very long, composed of flexible undivided rays, like the anal. Pectorals short; ventrals thoracic, each reduced to a single ray. Vent in the middle of the total length. *Microdesmus dipus*, pl. 3. fig. 2, from the Pacific coast of Panama.

ATHERINIDÆ.

Atherinichthys pachylepis, sp. n., Günther, Proc. Zool. Soc. 1864, p. 25, from the Pacific coast of Panama; *Atherinichthys guatemalensis*, sp. n., Günther, ibid. p. 151, from the Lakes of Huamuchal.

MUGILIDÆ.

Mugil güntneri, sp. n., Steindachner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 211, from British Guiana.

GASTEROSTEIDÆ.

Hr. Malmgren enumerates three Finnish species: *G. aculeatus*, *G. pungitius*, and *Spinachia vulgaris*. Wieg. Arch. 1864, p. 232.

Mr. J. Peers took 140 Sticklebacks from a trout-stream near Warrington; about one-half of them were *G. aculeatus* (*gymnurus*), the other half consisting chiefly of *G. pungitius*, with three or four *G. spinulosus*, and one example with five spines (an sp. n.?). Zoologist, 1864, p. 9145.

GOBIESOCIDÆ.

Lepadogaster. Prof. Canestrini has examined the Mediterranean species of this genus (Arch. per la Zool. 1864, p. 177); he describes and figures them, and adds the more important synonyms. Beside *Gouania* or *Leptopterygius*, another genus is separated from *Lepadogaster*, under the name of *Mirbelia*; it is founded on a very unimportant character, viz. the separation of the vertical fins, which are confluent in the other species. The following points are worthy of notice:—

a. *Lepadogaster wilidenowii* (Risso) is regarded as synonymous with *Gouania prototypus* (Nardo) = *Leptopterygius piger* (Nardo).

b. *Lepadogaster brownii* (Risso) has been recognized by the author, and is described (p. 186) under the same name.

c. *Lepadogaster acutus*, sp. n., p. 187.

d. *Mirbelia gracilis*, sp. n., p. 195, tav. 3. fig. 7.

Gobiesox rhodospilus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 25, from the Pacific coast of Panama.

OPHIOCEPHALIDÆ.

Channa ocellata, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 592; Hab. — ?

- LABYRINTHICI.

Anabas scandens. Observations made by Capt. Mitchell leave scarcely any doubt that this fish is not only able to move along firm ground, but also to climb trees; the organs of locomotion are the spiny opercles. Ann. & Mag. Nat. Hist. 1864, xiii. pp. 117 & 523.

Ctenopoma petherici, sp. n., Günther, Ann. & Mag. Nat. Hist. 1864, xiii. March, p. 211, from the Upper Nile.

ACANTHOPTERYGII PHARYNGOGNATHI.

(*Heliastes*) *Ayresia punctipinnis*, sp. n., Cooper, Proc. Calif. Acad. Nat. Sc. iii. p. 73, fig. 18, and p. 160, from San Diego Bay (California). D. $\frac{13}{13}$. A. $\frac{2}{11}$. L. lat. 30. The height of the body is somewhat more than one-third of the total length (without caudal). Bluish- or greenish-black; dorsal and caudal fins with black dots.

Labrus pulcher (Ayres) and *Cossyphus darwinii* (Jenyns) are the types of a distinct genus, *Pimelometopon*, according to Mr. Gill, Proc. Acad. Nat. Sc. Philad. 1864, p. 57. The former species is described.

Cossyphus diana appears to have received a new name by M. Guichenot, viz. *C. spilotes*, in Maillard, Notes sur l'île de la Réunion, App. p. 14.

(*Cossyphus*) *Crenilabrus modestus*, sp. n., Garrett, Proc. Calif. Acad. Nat. Sc. iii. p. 106, from the Sandwich Islands. D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 33. A large oblong pale diffuse spot below the end of the dorsal fin; dorsal with a large black blotch anteriorly.

PlatyGLOSSUS tenuispinis, which had been sufficiently characterized by the Recorder, is redescribed by Dr. Bleeker, Nederl. Tydschr. Dierk. 1864, p. 57.

PlatyGLOSSUS doleschalli (Steind.) proves to be identical with *Pl. schwarzi* (Blkr.). Steindachner, Verh. Zool.-Bot. Ges. Wien, 1864, p. 231.

PlatyGLOSSUS dispilus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 25, from the Pacific coast of Panama.

PlatyGLOSSUS (Leptojulis) dubius, sp. n., Steindachner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 210, taf. 2. fig. 2, from Zanzibar.

Pseudojulis notospilus, sp. n., Günther, Proc. Zool. Soc. 1864, p. 26, from the Pacific coast of Panama.

(*Gerres*) *Diapterus decacanthus*, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 58, from Amoy.

Gerres axillaris and *Gerres brevismanus*, sp. n., Günther, Proc. Zool. Soc. 1864, p. 152, both from Chiapam.

Dr. Günther, Proc. Zool. Soc. 1864, June 28, describes the following new species from Lake Nyassa:—

Chromis squamipinnis, p. 311; *Ch. lateristriga*, p. 312.

Hemichromis intermedius, p. 312; *H. robustus*, p. 312; *H. longiceps*, p. 313; *H. dimidiatus*, p. 313; and Proc. Zool. Soc. 1864, November 8, others from the Lake of Galilee:—

Chromis simonis and *Ch. andrea*, p. 492.

Hemichromis sacra, p. 493.

Dr. Steindachner, Verh. Zool.-Bot. Ges. Wien, 1864, April 6, describes three new species from West Africa:—

Chromis dumerilii, p. 225, taf. 7. fig. 1; *Ch. güntneri*, p. 228, taf. 8. figs. 3 & 4; *Ch. aureus*, p. 229, taf. 8. fig. 5. The same author figures *Ch. latus* (Gthr.), taf. 8. figs. 1 & 2; he has also recognized *Ch. niloticus* as a species inhabiting the Lake of Galilee, but somewhat too hastily identifies with it the *Sparus galilæus* (Hasselt.), which, after all, may prove to be a distinct species. See Günth. Proc. Zool. Soc. 1864, November 8.

Acara fuscomaculata (Guich.) is described by Steindachner, Denkschr. Acad. Wiss. Wien, 1864, xxiii. p. 60.

Acara rectangularis, sp. n., Steindachner, l. c. p. 57, taf. 1. fig. 1, from Mexico.

Heros. Dr. Steindachner has described and figured the following known species, in Denkschr. Acad. Wiss. Wien, 1864, xxiii.: *Heros urophthalmus* (Gthr.), p. 66, taf. 5. fig. 3, and *H. fenestratus* (Gthr.), p. 68, taf. 1. fig. 2.

The following new species have been described:—

Heros labiatus, Günther, Proc. Zool. Soc. 1864, p. 27, pl. 4. fig. 1, from the Lake of Managua; *H. guttulatus*, p. 152, and *H. macracanthus*, Günther, ibid. p. 153, from Guatemala; *H. citrinellus*, p. 153, *H. nicaraguensis*, p. 153, and *H. dovii*, Günther, p. 154, from the Lake of Nicaragua.

Heros bifasciatus, Steindachner, Denkschr. Acad. Wiss. Wien, 1864, xxiii. p. 60, taf. 2; *Heros lentiginosus*, Steind. l. c. p. 62, taf. 3. fig. 1; *Heros helleri*, Steind. l. c. p. 64, taf. 4. fig. 1; *Heros gibbiceps*, Steind. l. c. p. 66, taf. 5. figs. 1 & 2; *Heros maculipinnis*, Steind. p. 69, taf. 4. fig. 2; *Heros triagramma*, Steind. p. 70, taf. 3. fig. 2; *Heros melanopogon*, Steind. p. 72, taf. 1. fig. 3;—all from Central America.

Petenia splendida. A young example of this fish has been figured by Dr. Steindachner in Denkschr. Acad. Wiss. Wien, 1864, xxiii. taf. 4. figs. 3 & 4.

GADIDÆ.

Hr. Malmgren mentions the following species as occurring on the Finnish coasts:—*Gadus morrhua*, *G. navaga*, *G. saida*, *G. æglefinus*, *G. carbonarius*, *Lota lota*, *Lota vulgaris*, and *Brosmius vulgaris*. Wiegman. Arch. 1864, p. 297.

Chiasmodon niger (Johnson) proves to be a Gadoid fish. Dr. Günther gives a description of it in Catal. Fish. v. p. 435.

PLEURONECTIDÆ.

Prof. Steenstrup has examined very young specimens (about one inch long) of a form of Pleuronectoids which he names *Plagusia*, but the position of which in the system is not quite evident. They have the eyes on the left side, the upper in advance of the lower, a small mouth, pectoral fins on both sides, and the vertical fins continuous. In the youngest of these specimens he observed, like Van Beneden and others, that the eyes are symmetrically placed, one on each side; however, he differs from Van Beneden* in not believing that the asymmetry peculiar to the later stages of growth of these fishes is produced

* Prof. Steenstrup also states that Van Beneden's specimen was not a *Rhombus*, but perhaps a *Pleuronectes*, possibly no Pleuronectoid at all.

by a gradual, partial rotation of the front part of the skull round its longitudinal axis. Not only can it be demonstrated from an analysis of the head of an adult fish, that the position of the upper eye in relation to the frontal bones of the blind side is not explained by a simple rotation of the head, but the young specimens mentioned show that the eye of the blind side passes to the eye side, piercing the tissues *below* the arch formed by the frontal bones of its own side, separating them from the frontals of the other side, and taking its position above the other eye.—Specimens showing the upper eye situated in the median line of the *upper surface* of the frontal arch are monstrosities, and therefore they cannot prove the correctness of Van Beneden's theory. Thus, the specimen described by Hr. Malm as the young of *Rhombus laevis* is nothing but a monstrosity, like Donovan's *Pleuronectes cyclops*. Of particular interest is *Hippoglossus pinguis* (Fabr.), which reminds us of those "Cyclops-monstrosities" in having both sides equally developed as regards muscles as well as coloration, and in having the upper eye situated on the top of the snout. Future researches must show whether this is really a monstrosity of some other species.—This excellent memoir is illustrated by several woodcuts and by a plate showing the different stages of the metamorphosis of the young "Plagusia." *Cefvers. Dansk. Vidensk. Selsk. Förhandl.* in 1863, p. 253.

According to Hr. Malmgren the following species occur on the Finnish coasts: *Rhombus maximus*, *Pleuronectes fesus*, *Pl. dvinensis*, *Pl. limanda*, *Pl. limandoides*, and *Hippoglossus vulgaris*. *Wiegman. Arch.* 1864, p. 293.

Hippoglossus pinguis. Mr. Gill points out the differences between this fish and *Pleuronectes cynoglossus*. *Proc. Acad. Nat. Sc. Philad.* 1864, p. 218. Compare Prof. Steenstrup's remarks on this species recorded above, which leave no doubt that Mr. Gill is correct in considering the two fish as widely different.

Citharichthys microstomus, sp. n., Gill, *Proc. Acad. Nat. Sc. Philad.* 1864, p. 223, from the Atlantic coasts of North America.

(*Citharichthys*) *Metoponops cooperi*, g. and sp. n., Gill, *Proc. Acad. Nat. Sc. Philad.* 1864, p. 198, from California.

Hemirhombus ovalis, sp. n., Günther, *Proc. Zool. Soc.* 1864, p. 154, from the Pacific coast of Panama.

Pseudorhombus. Mr. Gill states that *Platessa ocellaris* and *Pl. oblonga* of Dekay are identical and ought to be named *Chenopsetta ocellaris*, and that *Platessa quadrocellata* (Storer) is identical with *Pleuronectes oblonga* (Mitch.), forming a species distinct from the former—*Chenopsetta oblonga*. *Proc. Acad. Nat. Sc. Philad.* 1864, p. 218.

Pleuronectes digrammus (Gthr.). Mr. Gill identifies this species with *Parophrys vetulus* (Girard), *Proc. Acad. Nat. Sc. Philad.* 1864, p. 196. We must add the following remarks on this point:—If Mr. Gill's identification be correct, *Parophrys* cannot remain as generic designation for that group of Pleuronectoids

for which the Recorder has retained this name, and which is distinguished by its minute teeth, but it will be another of the subgeneric divisions into which *Pleuronectes* has been split. Girard has described the teeth of *Parophrys vetulus* and *Pleuronichthys cænopus* as minute or inconspicuous, which is the reason why the Recorder referred them to his genus *Parophrys*: on the other hand, in the description of *Pleuronichthys guttulatus* no mention is made of the dentition; and as other characters clearly indicated its close affinity to *Pleuronectes digrammus*, it was placed along with this species.

Euchalarodus is a new genus established by Mr. Gill, Proc. Acad. Nat. Sc. Philad. 1864, p. 221, and distinguished from *Pleuronectes* and *Heteroprosopon* (= *Parophrys*, Gthr., not Girard) by having the teeth uniserial, moveable, reclining inwards, compressed and constricted near the apex. *Eu. putnami*, sp. n., from the coast of Massachusetts.

Mr. Gill (*l. c.* p. 216) has proposed some other generic names, viz., *Liopsetta* for *Platessa glabra* (Storer, in Bost. Proc. i. p. 130, and in Mem. Amer. Ac. viii. p. 393, pl. 31. fig. 1); *Pomatopsetta* for *Platessa dentata* (Storer); and *Lophopsetta* for *Pleuronectes maculatus* (Mitchell). On the other hand *Drepanopsetta* (Gill) is considered a synonym of *Hippoglossoides*.

SILURIDÆ.

Dr. Günther has had the good fortune to examine the fishes of this family at a time when the numerous typical specimens of Dr. Bleeker's collection were united with that of the British Museum, in which already numerous types had been accumulated. His researches led him to a complete systematic rearrangement of the family, in which he endeavoured to keep naturally allied forms together, whereas Dr. Bleeker had followed a more artificial method. The genera adopted or proposed by Dr. Bleeker (186) are reduced to 114, some of which, moreover, were unknown to him. We cannot here repeat the characters on which the subfamilies, groups, and genera have been founded, and must be satisfied with indicating the arrangement merely by an enumeration of the divisions (Fish. Y. pp. 1-277):—

First subfamily: SILURIDÆ HOMALOPTERÆ.

A. *Clariina*.

1. *Clarias* (Gronov.) with 25 species, seven of which are new: *Cl. parvimanus* from the Nile (p. 15), *Cl. orontis* from the Orontes (p. 15), *Cl. macracanthus* from the Nile (p. 16), *Cl. xenodon* (p. 16) and *Cl. macromystax* from West Africa, *Cl. macrocephalus* from Siam (p. 18), *Cl. brachysoma* from Ceylon (p. 20).

2. *Heterobranchus* (Geoffr.) with 7 species, one being new: *H. intermedius* from the Upper Nile (p. 22).

B. *Plotosina*.

3. *Plotosus* (Lacép.) with 3 species.

4. *Copidoglanis* (g. n.) with 3 species, one being new: *C. obscurus*, from Australia (p. 26).

5. *Chidoglanis* (g. n.) with 4 species, one being new: *Cn. lepturus* from New South Wales (p. 28).

C. *Chacina*.

6. *Chaca* (C. & V.) with 3 species, one being new: *Ch. buchanani* from the Ganges (p. 29).

Second subfamily: SILURIDÆ HETEROPTERÆ.

D. *Silurina*.

7. *Saccobranchus* (C. & V.) with 4 species, two of which are new: *S. microps* and *S. microcephalus* from Ceylon (p. 31).

8. *Silurus* (Artedi) with 6 species, one being new: *S. afghana* (p. 34).

9. *Silurichthys* (Blkr.) with 4 species.

10. *Wallago* (Blkr.) with 2 species.

11. *Belodontichthys* (Blkr.) with 1 species.

12. *Eutropiichthys* (Blkr.) with 1 species.

13. *Cryptopterus* (Gthr.*) with 15 species, one being considered new: *C. amboinensis* (pp. 40, 429).

14. *Callichrous* (Gthr.*) with 11 species, one being new: *C. ceylonensis* (p. 46).

15. *Schilbe* (Blkr.) with 5 species, *Sch. dispila* from West Africa being new (p. 51).

16. *Eutropius* (M. & Tr.) with 7 species, *Eut. obtusirostris* from India being new (p. 53).

17. *Hemisilurus* (Blkr.) with 2 species.

18. *Siluranodon* (Blkr.) with 1 species.

19. *Ailia* (C. & V.) with 2 species, one of which is new: *Ai. affinis* from the Himalayas (p. 56).

20. *Schilbichthys* (Blkr.) with 1 species.

21. *Laïs* (Blkr.) with 1 species.

22. *Pseudeutropius* (Blkr.) with 9 species, three of which are new: *Ps. mitchelli* (p. 59), *Ps. megalops* (p. 60), and *Ps. longimanus* (p. 60) from India.

23. *Pangasius* (C. & V.) with 8 species.

24. *Helicophagus* (Blkr.) with 2 species.

25. *Silondia* (C. & V.) with 1 species.

Third subfamily: SILURIDÆ ANOMALOPTERÆ.

E. *Hypophthalmina*.

26. *Helogenes* (Gthr.) with 1 species.

27. *Hypophthalmus* (C. & V.) with 4 species.

Fourth subfamily: SILURIDÆ PROTEROPTERÆ.

F. *Bagrina*.

28. *Bagrus* (Blkr.) with 2 species.

29. *Chrysichthys* (Gthr.) with 7 species, three of which are new: *Chr. macrops* from the Nile (p. 71), *Chr. furcatus* (p. 430) and *Chr. acutirostris* (p. 431) from West Africa.

30. *Clarotes* (Kner) with 1 species.

* The name of this and several of the following genera has been first used by Dr. Bleeker, but widely different limits have been assigned to these genera by Dr. Günther.

31. *Macrones* (Dum.) with 28 species, one being new: *M. elongatus* from Singapore (p. 77).

32. *Pseudobagrus* (Blkr.) with 4 species, one being new: *Ps. brachysoma* from Siam (p. 86).

33. *Liocassis* (Blkr.) with 5 species, two being new: *L. longirostris* from Japan (p. 87), described in the same year by Dr. Bleeker under the name of *Rhinobagrus dumerilii*, Nederl. Tydschr. Dierk. p. 7; *L. crassilabris* from China (p. 88).

34. *Bagroides* (Blkr.) with 3 species.

35. *Bagrichthys* (Blkr.) with 1 species.

36. *Rita* (Blkr.) with 7 species.

37. *Acrochordonichthys* (Blkr.) with 6 species.

38. *Akysis* (Blkr.) with 3 species.

39. *Olyra* (McCl.) with 1 species.

40. *Branchiosteus* (Gill) with 1 species.

41. *Amiurus* (Gthr.) with 13 well-characterized and 20 doubtful species. One is described as new: *A. meridionalis* from Guatemala (p. 102).

42. *Hopladelus* (Gill).

43. *Noturus* (Rafin.) with 5 species, *N. platycephalus* being new (p. 104).

G. *Pimelodina*.

44. *Sorubim* (Blkr.) with 1 species.

45. *Platystoma* (Agass.) with 12 species.

46. *Hemisorubim* (Blkr.) with 1 species.

47. *Platystomatichthys* (Blkr.) with 1 species.

48. *Phractocephalus* (Agass.) with 1 species.

49. *Piramutana* (Gthr.) with 2 species.

50. *Platynemichthys* (Blkr.) with 2 species.

51. *Piratinga* (Gthr.) with 6 species.

52. *Sciades* (Gthr.) with 2 species.

53. *Pimelodus* (Gthr.) with 50 species, 15 of which are new: *P. mülleri* (p. 119) and *P. holomelas* (p. 120) from South America; *P. guatemalensis* (p. 122); *P. wuchereri* from Bahia (p. 123); *P. godmanni* (p. 124), *P. micropterus* (p. 124), *P. nicaraguensis* (p. 125), *P. petenensis* (p. 126), *P. hypselurus* (p. 126), and *P. motaguensis* (p. 127) from Central America; *P. jennynsii* from Rio Janeiro (p. 128); *P. humilis* (p. 129), *P. salvini* (p. 130), and *P. polycaulus* (p. 131) from Central America. *Pimelodus platychir* (p. 134) is the first of its kind found in West Africa, and perhaps the type of a distinct genus, *Amphilius*.

54. *Pirinampus* (Blkr.) with 1 species.

55. *Conorhynchus* (Blkr.) with 1 species.

56. *Notoglanis* (g.n.) with 2 species; type *Pimelodus multiradiatus* (Kner).

57. *Callophysus* (M. & Tr.) with 3 species.

58. *Auchenaspis** (Blkr.) with 1 species.

H. *Ariina*.

59. *Arius* (Gthr.) with 86 species, 16 of which are new: *A. guatemalensis* (p. 145), *A. assimilis* (p. 146), *A. platypogon* (p. 147), *A. seemanni* (p. 147), and *A. caeruleus* (p. 149) from Guatemala; *A. latiscutatus* (p. 151) and *A.*

* This name has been proposed by Sir Ph. Egerton for a genus of fossil fishes; therefore we substitute the name of *Auchenoglanis* for the recent fish.

parkii (p. 154) from West Africa; *A. dasycephalus* from the Sandwich Islands (p. 157); *A. kirkii* from the Zambesi (p. 163); *A. macracanthus* from Siam (p. 167); *A. cochinchinensis* (p. 170), *A. nuchalis* and *A. laticeps* from British Guiana (p. 171); *A. melanopus* from the Rio Motagua (p. 172).

60. *Galeichthys* (Blkr.) with 1 species.

61. *Genidens* (Casteln.) with 1 species.

62. *Hemipimelodus* (Blkr.) with 5 species.

63. *Ketengus* (Blkr.) with 1 species.

64. *Ælurichthys* (Baird & Girard) with 5 species, two of which are new: *Æ. longispinis* (p. 178) and *Æ. nuchalis* (p. 179) from Central America.

65. *Paradiplomystax* (Blkr.) with 1 species.

66. *Diplomystax* (Dum.) with 1 species.

67. *Osteogeniosus* (Blkr.) with 3 species.

68. *Batrachocephalus* (Blkr.) with 1 species.

I. *Bagarina*.

69. *Bagarius* (Blkr.) with 1 species.

70. *Euclyptosternum* (Gthr.) with 1 species.

71. *Glyptosternum* (Gthr.) with 10 species, two of which are new: *Gl. gracile* from Nepal (p. 186) and *Gl. dekkanense* (p. 187).

[*Hara* (Blyth) with 3, and *Amblyceps* (Blyth) with 5 species.]

Fifth subfamily: SILURIDÆ STENOBRANCHIÆ.

K. *Doradina*.

72. *Ageniosus* (Lacép.) with 6 species, two of which are new: *A. setosus* (p. 192) and *A. axillaris* (p. 431) from Surinam.

73. *Tetranematichthys* (Blkr.) with 1 species.

74. *Euanemus* (M. & Tr.) with 1 species.

75. *Auchenipterus* (C. & V.) with 10 species, 3 of which are new: *Au. obscurus* (p. 195), *Au. longimanus* (p. 195), and *Au. robustus* (p. 197).

76. *Centromochlus* (Kner) with 2 species.

77. *Trachelyopterus* (C. & V.) with 2 species.

78. *Cetopsis* (Agass.) with 3 species.

79. *Asterophysus* (Kner) with 1 species.

80. *Doras* (Gthr.) with 17 species.

81. *Oxydoras* (Gthr.) with 7 species.

82. *Rhinodoras* (Gthr.) with 3 species.

83. *Synodontis* (C. & V.) with 12 species, 4 of which are new: *S. sorex* from the Nile (p. 211); *S. omias* (p. 213), *S. gambiensis* (p. 214), and *S. xiphias* (p. 215) from West Africa.

L. *Rhinoglanina*.

84. *Rhinoglanis* (g. n.); *Rh. typus* from the Nile (p. 216, c. fig.).

85. *Mochocus* (Joannis) with 1 species.

86. *Callomystax* (g. n.); typ. species *Pimelodus gagata* (B. H.).

M. *Malapterurina*.

87. *Malapterurus* (Lacép.) with 3 species, *M. affinis* from West Africa being new (p. 220).

Sixth Subfamily: SILURIDÆ PROTEROPODES.

N. *Hypostomatina*.

88. *Arges* (C. & V.) with 2 species.

89. *Stygogenes* (g. n.) : *St. humboldtii*, sp. n. (p. 223); *Pimelodus cyclopus* (Humb.) is probably a second species of this genus.

90. *Brontes* (C. & V.) with 1 species.

91. *Astroblepus* (Humb.) with 1 species.

92. *Callichthys* (L.) with 15 species, *C. affinis* (p. 226) being new.

93. *Plecostomus* (Gthr.) with 17 species, *Pl. wuchereri* and *Pl. brevicauda* being new (p. 235).

94. *Liposarcus* (g. n.) with 3 species, *Hypostomus multiradiatus* (Hancock) being the type; *Liposarcus altipinnis*, sp. n., from Brazil (p. 239).

95. *Chatostomus* (Heck.) with 28 species, 6 of which are new : *Ch. oligospilus* (p. 244); *Ch. schomburgkii* (p. 245); *Ch. trinitatis* (p. 246); *Ch. hoplogenys* (p. 247); *Ch. leucostictus* (p. 248); *Ch. microps* (p. 250).

96. *Pterygoplichthys* (Gill) with 4 species.

97. *Rhinelepis* (Spix) with 2 species.

98. *Acanthicus* (Spix) with 2 species.

99. *Loricaria* (L.) with 20 species.

100. *Acestra* (Kner) with 4 species, two of which are new : *A. amazonum* and *A. gladiolus* (p. 261).

101. *Sisor* (B. H.) with 1 species.

102. *Erethistes* (M. & T.) with 1 species.

103. *Pseudecheneis* (Blyth) with 1 species.

104. *Exostoma* (Blyth) with 2 species.

O. *Aspredinina*.

105. *Bunocephalus* (Kner) with 2 species.

106. *Bunocephalichthys* (Blkr.) with 1 species.

107. *Aspredo* (L.) with 6 species.

Seventh subfamily: SILURIDÆ OPISTHOPTERÆ.

P. *Nematogenyina*.

108. *Heptapterus* (Blkr.) with 2 species.

109. *Nematogenys* (Girard) with 1 species.

Q. *Trichomycterina*.

110. *Trichomycterus* (Val.) with 10 species.

111. *Eremophilus* (Humb.) with 1 species.

112. *Pariodon* (Kner) with 1 species.

Eighth subfamily: SILURIDÆ BRANCHICOLÆ.

R. *Stegophilina*.

113. *Stegophilus* (Rhrdt.) with 1 species.

114. *Vandellia* (C. & V.) with 2 species.

Hypophthalmus longifilis (C. & V.) has been figured by Bleeker, Silur. Surin. tab. 15. fig. 3.

Macrones. A new species from Siam, probably belonging to this genus, has been described by Dr. Bleeker under the name of *Heterobagrus* (g. n.) *bocourti*. Versl. en Mededeel. Akad. Wet. Amsterd. 1864, xvi. p. 355 c. fig.

Pseudobagrus. *Silurus calvarius* (Basil.), referred by Dr. Günther as a doubtful synonym to *Ps. fulvidraco* (Richards.), is, according to Dr. Bleeker's view, the type of a distinct genus, *Pelteobagrus*. Nederl. Tydschr. Dierk. 1864, p. 9.

Mr. Cope has described a new genus belonging to the *Amiurina*, which he has named *Gronias*; it is blind, the eyes being rudimentary, covered by the corium; ventral rays eight. *G. nigrilabris*, sp. n., from Pennsylvania. It is occasionally caught by fishermen, and is supposed to issue from a subterranean stream, said to traverse the Silurian limestone in Lancaster county, and discharge into the Conestoga. Proc. Acad. Nat. Sc. Philad. 1864, p. 231.

Pimelodus. Dr. Bleeker (Silur. Surin. in Natuurk. Verhand. Holl. Maatsch. Wet. Haarlem, 1864) has described the following known species: *Pimelodus sebae* (C. & V.), which he has confounded with *Pimelodus queleni* (Q. & G.), naming it *Rhamdia queleni*, p. 75; *Pimelodus ornatus* (Kner), p. 77; and *Pseudorhamdia macronema* (Blkr.), p. 79, tab. 14 & tab. 13. fig. 7 [which we consider identical with *Pimelodus maculatus*, Lacép.].

Pimelodus altipinnis, sp. n., Steindachner, Sitzgsber. Acad. Wiss. Wien, 1864, xlix. p. 213, taf. 2: figs. 3 & 4, from Demerara.

Arius. The following known species have been described and figured by Dr. Bleeker, Silur. Surin. in Natuurk. Verh. Holl. Maatsch. Wet. Haarlem, 1864: *A. dieprinki* (Blkr.), p. 50, tab. 10 & tab. 12. fig. 3; *A. fissus* (C. & V.), p. 52, tab. 4. fig. 1; *A. arenatus* (C. & V.), p. 53, tab. 4. fig. 2; *A. (Hexanemachichthys) surinamensis* (Blkr.), p. 55, tab. 6. fig. 2 & tab. 12. fig. 1; *A. (Hex.) hymenorrhinus* (Blkr.), p. 57, tab. 11. fig. 2 & tab. 13. fig. 4; *A. quadriscutis*, C. & V. (identified by Günther with *A. parkeri*, Traill, and very closely allied to *A. luniscutis*, C. & V.), p. 59, tab. 8 & tab. 13. fig. 2; *A. herzbegii* (C. & V.), p. 60, tab. 9 & tab. 13. fig. 3 (*A. pemecus*, C. & V., is considered identical with this species); *A. proops* (C. & V.), p. 62, tab. 7 & tab. 12. fig. 2; *A. (Neotuma) dubius* (Blkr.), p. 63, tab. 15. fig. 2 & tab. 13. fig. 5.

Arius stricticassis (C. & V.). We are indebted to Dr. Bleeker for a description and figure of this species, which had been insufficiently characterized by Valenciennes. It has seven soft dorsal rays, and is allied to *Arius müberti*; there is no separate interneural shield. Silur. Surin. p. 49, tab. 5 & tab. 12. fig. 4.

Arius fissus. The eggs of this species are comparatively very large; and it would appear from an observation made by Dr. Günther that the males carry the eggs in their mouth, depositing them in places of safety, and removing them when they fear the approach of danger or disturbance. Catal. Fish. v. p. 173.

Æthrichthys. Dr. Bleeker has described two of the known species of this genus (Silur. Surin. in Natuurk. Verh. Holl. Maatsch. Wet. Haarlem, 1864), viz. *Æthrichthys gronovii* (C. & V.) under the name of *Pimelodus bagre*, p. 66, and *Æthrichthys longispinis* (Gthr.) under that of *Pimelodus filamentosus*, adding to the latter the synonymy which properly belongs to *Æl. marinus* (Mitch.).

Ageniosus axillaris, sp. n., Günther, v. p. 431, from Surinam. This species appears to have been confounded by Dr. Bleeker with *A. brevifilis* (C. & V.), Silur. Surin. p. 83, taf. 16. fig. 1.

Ageniosus militaris. Dr. Bleeker directs our attention to the dorsal spine of this species, which, according to Bloch, is longer than the head, whilst it is much shorter in the specimens examined by Valenciennes. Thinking that this discrepancy can be accounted for only by assuming that Bloch and Valenciennes have examined two distinct species, he proposes the name of

A. valenciennesii for the specimens in the Paris Museum. Silur. Surin. p. 81.

Euanemus nichalis (Spix) has been figured by Bleeker, Silur. Surin. tab. 16. fig. 2 (*Auchenipterus dentatus*).

Auchenipterus maculosus (C. & V.) is considered by Dr. Bleeker identical with *Au. galeatus* (L.), Silur. Surin. p. 45. However, it appears from an examination of the specimens in the British Museum that both are distinct, Günth. Fish. v. p. 196. *Parauchenipterus galeatus*, Blkr., is probably identical with *Auchenipterus maculosus*, C. & V., Gthr.

Auchenipterus nodosus has been described and figured by Dr. Bleeker, Silur. Surin. p. 43, tab. 11. fig. 1 & tab. 13. fig. 6.

Doras granulosus (C. & V.) has been described by Dr. Bleeker under the name of *Pterodoras granulosus*, from a specimen in the Amsterdam Museum, Silur. Surin. p. 36. Dr. Günther had referred this *Doras granulosus* as a doubtful synonym to *D. muricatus*.

Doras cataphractus has been described by Dr. Bleeker under the name of *Acanthodoras cataphractus*, Silur. Surin. p. 40. Also the specimens in the Leyden Museum appear to lack the spine which was said by Gronow to exist in the adipose fin.

Callichthys. Dr. Bleeker (Silur. Surin. in Natuurk. Verhandel. Holl. Maatsch. Wet. Haarlem, 1864) has described the following known species: *Callichthys taimoata* (p. 22), to which *C. caelatus* (C. & V.) is referred as synonymous; *C. littoralis* (*Hoplosternum lævigatum*, p. 24); *C. thoracatus* (p. 26); *C. longifilis* (p. 27).

Plecostomus bicirrhosus is described by Dr. Bleeker under the new name of *Pl. brasiliensis*, Blkr. Silur. Surin. p. 7. This new name has been chosen because, in the opinion of the author, the species was described by Willughby under the denomination "*Cataphractus brasiliensis et americanus*." Hence it appears that Dr. Bleeker goes back to the seventeenth century for the regeneration of our nomenclature!—The same author describes and figures *Plecostomus guttatus* (C. & V.) under the name of *Pseudancistrus guttatus*, l. c. p. 10, tab. 2. fig. 2; tab. 3. fig. 3.

Chaetostomus temminckii (C. & V.) is described and figured by Bleeker, Silur. Surin. p. 11, tab. 1. fig. 3 & tab. 3. fig. 2 (*Ancistrus temminckii*). It is said to differ from *Ch. cirrhosus* in the length of the pectoral spines; but this is a rather dubious character. *Chaetostomus serratus* (C. & V.), ibid. p. 13, tab. 1. fig. 2 & tab. 3. fig. 1 (*Pseudacanthicus serratus*).

Loricaria. Dr. Bleeker (Silur. Surin. in Natuurk. Verhandel. Holl. Maatsch. Wet. Haarlem, 1864) has described the following known species: *L. maculata* (*Loricarichthys maculatus*, p. 16), *L. dura* (p. 18), and *L. parahemiodon* (*Parahemiodon typus*, p. 20, tab. 6. fig. 1 & tab. 13. fig. 1).

Aspredo. Dr. Günther has made the observation, that the females of these fishes carry their ova in small shallow pouches on the belly, and that the appendages which have been found on the belly of certain specimens serve for the purpose of keeping the eggs attached to the abdominal surface. Catal. Fish. v. p. 267.

Dr. Bleeker has described the following known species, Silur. Surin. in Natuurk. Verh. Holl. Maatsch. Wet. Haarlem, 1864: *Aspredo batrachus* (L.),

p. 93; *A. cotylophorus* (Bl.), p. 95; *A. (Platystacus) nematophorus* (Blkr.), p. 96, tab. 1. fig. 1; *A. tibicen* (C. & V.), p. 98, tab. 2. fig. 1.

Heptapterus surinamensis (Blkr.) has been figured by Bleeker, Silur. Surin. tab. 15. fig. 1.

SCOPELIDÆ.

Dr. Günther (Catal. Fish. v. p. 393) has restricted the limits of this family, retaining in it those forms only which have the entire margin of the upper jaw formed by the intermaxillary. He has arranged them thus:—

A. SAURINA, with the genera *Saurus*, *Saurida*, *Harpodon*, *Aulopus*, *Chlorophthalmus*, *Scopelus*, *Scopelosaurus*, and *Odontostomus*.

B. PARALEPIDINA, with the genera *Paralepis* and *Sudis*.

C. ALEPIDOSAURINA, with the genus *Alepidosaurus*.

Saurus altipinnis, sp. n., from China. Günth. Fish. v. p. 397.

Saurida grandisquamis, sp. n., from the Louisiade Archipelago. Günth. Fish. v. p. 400.

Scopelus. Dr. Günther has described the following new species: *Sc. parvimanus* from the Southern Pacific (v. p. 406); *Sc. macrochir* (p. 408); *Sc. subasper* from the Pacific (p. 411).

Myctophum megalops, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 393, from Cape Horn.

Paralepis borealis (Reinh.). For this species a generic name—*Actozenus*—has been proposed by Mr. Gill, Proc. Acad. Nat. Sc. Philad. 1864, p. 188.

STERNOPTYCHIDÆ.

This family has been established by Dr. Günther (Catal. Fish. v. p. 384) for those of Müller's Scopeloids which have the margin of the upper jaw formed by the maxillary and intermaxillary, both of which are toothed; none of these fishes have a barbel. They are divided into three groups:

A. STERNOPTYCHINA, with the genera *Argyropelecus* and *Sternoptyx*.

B. COCCINA, with the genera *Coccia* (= *Ichthyococcus*, Bonap.) and *Maurolucus*.

C. CHAULIODONTINA, with the genera *Gonostoma* and *Chauliodus*.

STOMIATIDÆ.

This small family has been established by Dr. Günther (Catal. Fish. v. p. 424) for some pelagic fishes which by some authors had been placed among the Scopeloids. He characterizes it thus:

Skin naked, or with exceedingly fine scales; a hyoid barbel. Margin of the upper jaw formed by the intermaxillary and maxillary, which are both toothed; opercular apparatus but little developed. Gill-opening very wide; pseudobranchiæ none. (Air-bladder absent?) Adipose fin absent or present. The eggs are enclosed in the sacs of the ovarium, and excluded by oviducts.

A. ASTRONESTHINA, with the genus *Astronesthes* (Richards.).

B. STOMIATINA, with the genera *Stomias* (Cuv.), *Echiostoma* (Lowe), and *Malacosteus* (Ayres).

CYPRINIDÆ.

The following species are mentioned as occurring in Finland by Dr. Malmgren, Wiegman. Arch. 1864, pp. 306-321: *Cobitis barbatula* and *C. tænia*; *Carassius vulgaris*, *Tinca vulgaris*, *Gobio fluviatilis*; *Abramis brama*, *A. vimba*, and *A. blicca*; *Pelecus cultratus* (Lake Ladoga); *Alburnus lucidus*, *Aspius rapax*, *Idus melanotus*, *Scardinius erythrophthalmus*, *Leuciscus rutilus*; *Squalius cephalus* and *Squ. leuciscus*; *Phoxinus phoxinus*.

Carpoides asiaticus, from China, is a new species described by Dr. Bleeker, and interesting as an Asiatic representative of an American family. Nederl. Tydschr. Dierk. 1864, p. 19.

Cyprinus. Hr. Jackel mentions hybrids between a variety of the common Carp (*C. macrolepidotus*) and the Crucian Carp (*C. carassius*), which he names *Carpio sieboldii*. Fische Bayerns, p. 21.

Cyprinus maillardi, sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 14, from Bourbon.

Carassius vulgaris, Nilss. var. *capensis*, Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 393.

Garra ceylonensis, sp. n., Bleeker, Cob. et Cypr. Ceyl. p. 8, tab. 1. fig. 4.

Scaphiodon sieboldii, sp. n., Steindachner, Verh. Zool.-Bot. Ges. Wien, 1864, p. 224, from Amasia in Asia Minor. According to the same gentleman, *Sc. socialis* (Heck.) is identical with *Sc. capoëta* (Heck.).

Barbus eques (Bonap.) and *Barbus plebejus* (Bonap.) are considered to be specifically identical by Prof. Canestrini, Arch. per la Zool. 1864, p. 110.

Barbus bocagei, sp. n., Steindachner, Catal. prélim. p. 3, from Spain and Portugal; *Barbus comizo*, sp. n., Steindachner, ibid. p. 4, from the Tajo.

Barbus serra, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 394, from the Cape of Good Hope.

Barbus (Capoëta) afer, sp. n., Peters, l. c. p. 395, from the same locality.

Labeobarbus tor (B. H.) is described and figured by Bleeker, Cob. et Cypr. Ceyl. p. 10. tab. 2.

Puntius phutunis (B. H.) is described and figured by Bleeker, Cob. et Cypr. Ceyl. p. 12, tab. 4. fig. 4; *Puntius chrysopoma* (C. & V.), ibid. p. 15, tab. 3. fig. 1; *Puntius pleurotænia*, sp. n., ibid. p. 13, tab. 3. fig. 2.

Puntius proctozyson, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 197, from Siam. The description will be republished in Versl. en Mededeel. Akad. Wet. Amsterd. vol. xvii., where the species will be figured.

Catla buechanani. Prof. Hyrtl has discovered that this fish has the upper part of the oesophagus exceedingly narrow, the lower pharyngeals being very short. On this occasion, he states that he coincides with Prof. Owen's opinion that the Cyprinoids are ruminant animals. Sitzungsber. Acad. Wiss. Wien, 1864, vol. 49. p. 161, with a plate.

Gnathopogon javanicus, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 137,

from Java; *Gnathopogon bimaculatus*, sp. n., Bleeker, Cob. et Cypr. Ceyl. p. 17, tab. 4. fig. 1.

Rasbora. Dr. Bleeker refers *Leuciscus teretiusculus* (Basil.) to this genus. Nederl. Tydschr. Dierk. 1864, p. 26; he describes a new species from Java (Krawang), *Rasbora macrocephalus*, l. c. p. 139; and, finally, describes and figures *Rasbora dandia* (C. & V.) in Cob. et Cypr. Ceyl. p. 18. tab. 1. fig. 3.

Danio micronema, sp. n., Bleeker, Cob. et Cypr. Ceyl. p. 21, tab. 4. fig. 2; *Danio lineolatus* (Blyth?), ibid. p. 19, tab. 4. fig. 3.

Pimephales milesii, sp. n., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 282, from Michigan.

Campostoma callipteryx, *C. mormyrus*, and *C. gobioninum*, from Michigan, and *C. hippops*, from Kansas, are new species described by Cope, l. c. p. 284.

Hybognathus stramineus and *H. volucellus*, from Michigan, and *H. procne*, from the Conestoga, are new species described by Cope, l. c. p. 283.

Algansea antica, sp. n., Cope, l. c. p. 282, from Texas.

Hypsilepis frontalis (Agass.) and *H. cornutus* (Baird). Mr. Cope makes some remarks on varieties of these species, l. c. p. 279.

Plargyrus americanus, sp. n., Cope, l. c. p. 281, from Michigan.

Gobio heterodon, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 26, from China.

Tinca vulgaris. Dr. Malmgren fixes 62° lat. N. as the northern limit of the Tench in Finland. Wieg. Arch. 1864, p. 310.

Chrysomus eos. Its differences from *Chr. erythrogaster* are pointed out by Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 281.

Rhinichthys lunatus, from Michigan, and *Rh. maxillosus*, from Kansas, are new species described by Cope, l. c. p. 278.

Acanthobrama simoni, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 25, from China.

Paracanthobrama guichenoti, g. et sp. n., Bleeker, l. c. p. 23, from China.

Parabramis is a new genus founded by Dr. Bleeker on *Abramis pekinensis* (Basil.); it is characterized thus:—Corpus oblongum valde compressum, squamis magnis vestitum. Rostrum convexum. Os parvum symphysi nec hamatum nec tuberculatum. Os suborbitale anterius subpentagonum, apice sursum spectans. Oculi subposterii. Linea lateralis leviter curvata. Pinna dorsalis brevis post ventrales rejecta, basi alepidota, spinis 2 osseis edentulis armata, spina posteriore magna crassa. Pinna analis valde elongata, multi-radiata. Dentes pharyngeales compressorii 2.5.3 | 3.5.2. Vesica natatoria trilobata.—The species is described. Nederl. Tydschr. Dierk. 1864, p. 21.

Blicopsis has been established by Prof. v. Siebold for *Leuciscus abramo-rutilus* (Holandre), which he believes to be a hybrid fish. Hr. Jackel has examined numerous similar fishes, and distinguishes two forms: 1, the true *Blicopsis abramo-rutilus*, which he believes to be produced by *Abramis blicca* and *Leuciscus rutilus*, and 2, *Blicopsis erythrophthalmoides* (Jackel), a hybrid between an *Abramis blicca* and a *Scardinius erythrophthalmus*. Fische Bayerns, p. 42.

Alburnus alborella (De Fil.) var. *lateristriga*, or *A. fracchia* (Heck. & Kner),

may be a hybrid between *A. alborella* and *Leucos aula*. Canestrini, Arch. per la Zool. 1864, p. 103.

Alburnus oligaspis, sp. n., Cope, Proc. Acad. Nat. Sc. Philad. 1864, p. 282, from Kansas.

Hybopsis phaëna, sp. n., Cope, l. c. p. 279, from the Delaware.

Pogonichthys (Platygobio) gulonellus, sp. n., Cope, l. c. p. 277, from Michigan.

Ceraticthys cyclotis, *C. micropogon* and *C. stigmaticus*, sp. n., Cope, l. c. pp. 277 & 278, from Michigan.

Leuciscus agassizii. Prof. Canestrini considers *Telestes muticellus* (Bonap.) and *Telestes savignyi* (Bonap.) to be varieties of *Telestes agassizii*. Arch. per la Zool. 1864, p. 108.

Leuciscus erythrophthalmus. Prof. Canestrini considers *Scardinius macrophthalmus* (Heck. & Kner), *Scard. scardafa* (Bonap.) and *Scard. plotizza* (Heck. & Kner) synonymous with *Scard. erythrophthalmus*. Arch. per la Zool. 1864, p. 105.

Cyprinella. Mr. Cope refers *Leuciscus kentuckiensis* (Kirtl.) to this genus. Proc. Acad. Nat. Sc. Philad. 1864, p. 279.

Alburnops heterodon and *A. plumbeolus*, sp. n., Cope, l. c. p. 282, from Michigan.

Squalius proriger from Michigan, *S. photogenis* from Philadelphia, and *S. hyalope* from the Conestoga, are new species described by Cope, l. c. p. 280.

Elopichthys. Dr. Bleeker corrects the characters of this genus, which he had established without knowing the species. Nederl. Tydschr. Dierk. 1864, p. 27.

Culter erythropterus (Basil.) has been examined by Dr. Bleeker, who corrects the specific and generic characters previously given. Nederl. Tydschr. Dierk. 1864, p. 27.

Paralaubuca typus, g. et sp. n., Bleeker, l. c. p. 15, from Bangkok.

Pseudolaubuca sinensis, g. et sp. n., Bleeker, l. c. p. 28, from China.

Pelotrophus, g. n., Günther, Proc. Zool. Soc. 1864, p. 314: distinguished from *Leuciscus* by the form of the anal fin, the anterior part of which is much elevated, whilst the posterior is very low, both parts being abruptly divided.—The genus is founded on two new species from Lake Nyassa, *P. microlepis* and *P. microcephalus*.

Cobitis barbatula and *C. tænia*. The geographical distribution of these two species in Scandinavia is remarkable. The former species is entirely absent in Denmark and the Scandinavian peninsula, but common in Finland, whilst, on the other hand, *C. tænia* is rare and very local in Finland, but generally distributed throughout Denmark and the southern half of Sweden. Malmgren, in Wieg. Arch. 1864, p. 306.

Cobitis galilea, sp. n., Günther, Proc. Zool. Soc. 1864, p. 493, from the Lake of Galilee.

Cobitis (Lepidocephalichthys) thermalis (C. & V.) is described and figured by Bleeker, Cob. et Cypr. Ceyl. p. 6, tab. 1. fig. 1.

Botia modesta, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 11, from Siam.

Nemacheilus nudus, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 12,

from China; *Nemacheilus notostigma*, sp. n., Bleeker, Cob. et Cyprin. Ceyl. in Nat. Verh. Holl. Maatsch. Wet. Haarlem, 1864, p. 5, tab. 1, fig. 2.

CHARACINIDÆ.

This is the second family treated of in the fifth volume of Dr. Günther's Catalogue of Fishes. It is adopted with the same limits which were assigned to it by Müller and Troschel. The number of generic and specific forms, however, has been much increased since the time of the publication of the 'Horæ Ichthyologicæ,' especially through the labours of Valenciennes and Kner. Dr. Günther has also been able to make numerous additions to the knowledge of this family, as will be seen from the following systematic synopsis:—

First group: ERYTHRININA.

1. *Macrodon* (M. & Tr.) with 9 species, five of which are doubtful. Two have been described as new: *M. intermedius* and *M. microlepis* (p. 282).
2. *Erythrinus* (Gronov.) with 7 species, two of which are new: *E. longipinnis* and *E. brevicauda* (p. 285).
3. *Lebiasina* (C. & V.) with 1 species.
4. *Pyrrhulina* (C. & V.) with 1 species.
5. *Corynopoma* (Gthr.) with 4 species.

Second group: CURIMATINA.

6. *Curimatus* (Gthr.) with 15 species, four of which are new: *C. spilurus* (p. 288); *C. troschellii* (p. 290); *C. essequibensis* (p. 291); *C. schomburgkii* (p. 291).
7. *Prochilodus* (Agass.) with 12 species, two of which are new: *P. humeralis* (p. 294) and *P. oligolepis* (p. 295).
8. *Cænotropus* (Gthr.) = *Chilodus* (M. & Tr.) with 2 species.
9. *Hemiodus* (M. & Tr.) with 9 species, two of which are new: *H. microcephalus* (p. 298) and *H. gracilis* (p. 299).
10. *Saccodon* (Kner) with 1 species.
11. *Parodon* (C. & V.) with 2 species.

Third group: CITHARININA.

12. *Citharinus* (M. & T.) with 2 species.

Fourth group: ANOSTOMATINA.

13. *Anostomus* (Gronov.) with 8 species.
14. *Rhytiodus* (Kner) with 2 species.
15. *Leporinus* (Spix) with 15 species, four of which are new: *L. megalepis* (p. 307); *L. affinis* (p. 308); *L. margaritaceus* (p. 309); *L. melanopleura* (p. 310).

Fifth group: TETRAGONOPTERINA.

16. *Piabucina* (C. & V.) with 2 species, *P. unitæniata* being new (p. 311).
17. *Alestes* (Gthr.) with 4 species.
18. *Brachyalestes* (g. n.) with 6 species. *Myletes nurse* (Rüpp.) is the type; two species are new: *B. ruppellii* from the Upper Nile (p. 315) and *B. longipinnis* from West Africa (p. 315).
19. *Tetragonopterus* (Cuv.) with 39 species, the following of which are new: *T. compressus* (p. 319); *T. polylepis* (p. 320); *T. brevirostris* (p. 321);

T. microstoma (p. 323); *T. microphthalmus* (p. 324); *T. panamensis* (p. 324); *T. brevimanus* (p. 325); *T. petenensis* (p. 326); *T. humilis* (p. 327); *T. oligolepis* (p. 327); *T. chrysargyreus* (p. 328); *T. affinis* (p. 329); *T. caudomaculatus* and *T. polyodon* (p. 330).

20. *Scissor* (g. n.): *Sc. macrocephalus*, sp. n., probably from Surinam (p. 331).
21. *Pseudochalceus* (Kner) with 1 species.
22. *Chirodon* (Girard) with 2 species.
23. *Chalceus* (Cuv.) with 1 species.
24. *Brycon* (M. & Tr.) with 14 species, four of which are new: *B. nattereri* and *B. bahiensis* (p. 334); *B. orthotenia* and *B. brevicauda* (p. 335).
25. *Chalcinopsis* (Kner) with 4 species.
26. *Bryconops* (Kner) with 2 species.
27. *Creagrutus* (g. n.); type, *Leporinus mülleri* (Gthr.).
28. *Chalcinus* (C. & V.) with 4 species, *Ch. elongatus* being new (p. 342).
29. *Gastrolepis* (Gronov.) with 3 species, *G. strigatus* being new (p. 343).
30. *Piabuca* (M. & Tr.) with 2 species, *P. spilurus* being new (p. 344).
31. *Agoniales* (M. & Tr.) with 1 species.

Sixth group: HYDROCYONINA.

32. *Anacyrtus* (Gthr.) = *Epicyrus* (M. & Tr.) with 8 species, two of which are new: *A. pauciradiatus* (p. 346) and *A. guatemalensis* (p. 347).
33. *Hystericodon* (Gthr.) with 1 species (*Exodon paradoxus*, M. & Tr.).
34. *Salminus* (M. & Tr.) with 3 species.
35. *Hydrocyon* (M. & Tr.) with 3 species, *H. brevis* from the Nile being new (p. 351).
36. *Sarcodaces* (g. n.); type *Salmo odœ* (Bl.).
37. *Oligosarcus* (g. n.): *O. argenteus*, sp. n., from Brazil (p. 353).
38. *Xiphorhamphus* (M. & Tr.) with 7 species.
39. *Xiphostoma* (Spix) with 5 species.
40. *Cynodon* (Spix) with 3 species.

Seventh group: DISTICHODONTINA.

41. *Distichodus* (M. & Tr.) with 7 species, four of which are new: *D. rostratus* (p. 360), *D. engycephalus* (p. 361), and *D. brevipinnis* (p. 361) from the Nile; *D. macrolepis* from the river Shire (p. 362).

Eighth group: ICHTHYBORINA.

42. *Ichthyborus* (g. n.): the two species known are *Characinus besse* (Joannis) and *I. microlepis*, sp. n. (p. 363), both from the Nile; the latter species has been meanwhile described by Prof. Kner under the name of *Psalidostoma caudimaculatum* (Sitzgsber. Acad. Wiss. Wien, 1864, 50. p. 39, with a plate).

Eighth (bis) group: PHAGONINA*.

- 42 bis. *Phago* (g. n.): *Ph. loricatus*, sp. n., from Old Calabar.

* In introducing this form here, we anticipate the Record of next year, as it has been described in Ann. & Mag. Nat. Hist. 1865, March, pl. 5; but we think it useful to mention it in the place which it will take in the system. This group may be characterized thus:

PHAGONINA. Characinoids with an adipose fin, with a short dorsal, with the gill-membranes attached to the isthmus, with the belly rounded, and with both jaws very moveable, their lateral halves being united into one piece.

Ninth group: CRENUCHINA.

43. *Crenuchus* (Gthr.) with 1 species.

Tenth group: SERRASALMONINA.

44. *Mylesinus* (C. & V.) with 1 species.

45. *Serrasalmo* (Lacép.) with 16 species, two of which are new: *S. scapularis* (p. 368) and *S. gymnogens* (p. 371).

46. *Myletes* (Gthr.) with 27 species, two of which are new: *M. parma* (p. 374) and *M. ellipticus* (p. 375).

47. *Catoprion* (M. & Tr.) with 1 species.

CYPRINODONTES.

Pacilia. Prof. Peters does not agree with Dr. Bleeker in considering that the West-African *Pacilia* described by A. Duméril are generically distinct from the American species; he describes two new species from Liberia—*Pacilia bensonii* (p. 395) and *Pacilia sexfasciata* (p. 396), and reunites *P. surinamensis* (C. & V.) with *P. vivipara* (Bl., Schn.), adding a few remarks on the typical specimen of the latter. Monatsber. Acad. Wiss. Berl. 1864, p. 395.

MORMYRIDÆ.

Dr. Marcusen has chosen this family for the subject of a separate monograph, which is published in the seventh volume of the Mém. Acad. Sc. St. Pétersb. 1864. It is divided into a larger, anatomical part, and a smaller, zoological one. The former is illustrated by five plates.

In the anatomical part very detailed descriptions of the various organs are given, and particular attention is paid to their modifications in the different species. With regard to the peculiar cerebral appendage of the fishes of this family, Dr. Marcusen is of opinion that it is a special organ, which does not correspond homologically to any part of the brain of other fishes; however, its intimate connexion with the brain and its uninterrupted continuity with the cerebellum tend to show that it is really a part of the brain, and not merely an organ annexed to it. If we look for an homologous part in the brain of other *Teleostei*, it is the cerebellum alone which can be considered such.

The zoological part does not contain the latest additions to our knowledge of this family, but gives original descriptions of the more common species of the Lower Nile; and the other species described by Valenciennes and Peters are also characterized. Dr. Marcusen adopts four genera: 1. *Mormyrus* (*M. oxyrhynchus*, *M. anguilloides*, &c.); 2. *Mormyrops* (*M. cyprioides*); 3. *Phagrus* (*Ph. dorsalis*); 4. *Petrocephalus* (*M. bane*, &c.). The Recorder's own researches on this family have led him to a somewhat different division of the species, as will be shown in our next Report.

Dr. Günther has described a new species of *Mormyrus*, *M. tamandua*, from West Africa, Proc. Zool. Soc. 1864, p. 22; it is figured on plate 2, together with another species lately described, *M. petersii* (Gthr.).

SCOMBERESOCIDÆ.

Scomberesox camperi. Prof. Nilsson reports on the occurrence of this species in the Scandinavian seas. Öfvers. Svensk. Vetensk. Acad. Förhandl. 1864, p. 501.

GALAXIDÆ.

Mesites gracillimus, sp. n., Canestrini, Arch. per la Zool. 1864, p. 100, tav. 4. fig. 2. from Chile.

HAPLOCHITONIDÆ.

This small family has been established by Dr. Günther (Catal. Fish. v. p. 381) for *Haplochiton* (Jenyns) = *Farionella* (C. & V.), and for a new genus from Southern Australia—*Prototroctes*, which genera remind us of the Salmonoids of the northern hemisphere. Whether they can remain in the same family, further researches must show, as the Australian form is known from a skin only, and differs from *Haplochiton* in being covered with scales. The new species has been named *Pr. maræna*, and the characters of this family have been fixed, for the present, as follows:—Body naked or scaly. Margin of the upper jaw formed by the intermaxillary; opercular apparatus complete. Barbels none. Gill-opening wide; pseudobranchiæ well developed. Air-bladder simple. Adipose fin present. Ovaries laminated; the eggs fall into the cavity of the abdomen, there being no oviduct. Pyloric appendages none.

SALMONIDÆ.

Mag. H. Widegren has written a long paper, in which he attempts to show that the River-Trout, Lacustrine Trout (*S. lacustris*, *S. ferox*, *S. microps*, &c.), and the Sea- or Salmon-Trout are all one and the same species, which assumes a different appearance according to the locality inhabited by the several individuals (Öfvers. Vetensk. Akad. Förhandl. 1863). He names this species *Salmo trutta*. In a second paper (ibid. 1864, p. 279) he enters into an examination of the development of young examples of the three different forms of this *Salmo trutta*, showing that the form of the caudal fin and the coloration are connected with the development of the sexual organs. According to his observations, sterile individuals of these fishes do not remain in this condition throughout their life, as is maintained by Prof. v. Siebold, but some attain to maturity at a much earlier period of their growth than others, without the cause of this difference being apparent. Sterility is, according to Hr. Widegren, only a temporary, transitory immaturity. During the period of immaturity, all the forms named have the caudal fin more deeply emarginate, and are more silvery, than specimens of the same age and size which have ova or semen developed. As regards River-Trout, no specimen less than 110 mm. long is able to

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propagate its species; males which are one or two years old are from 110 to 175 mm. long, and about one half of their number are sexually developed, whilst the other half are in an immature state. On the other hand, females of the same age, and from 156 to 163 mm. long, are only exceptionally fertile, by far the greater part remaining sterile for a longer period; in the sterile females the longest caudal rays are twice as long as the shortest, whilst in a mature female (163 mm. long) the longest caudal rays were 21 mm. long, and the shortest 11 mm.; and in another (156 mm. long) the longest rays were $23\frac{1}{2}$ mm., and the shortest 14 mm. The depth of the incision of this fin remains relatively the same during the growth of the individual, until the period of the sexual development arrives.

The same variations in the development may be observed in the migratory forms (in those which migrate to the sea, as well as in those which go into some large freshwater lake) and in the Salmon. However, fertile specimens of these forms have been found, in which the caudal fin was more deeply emarginate than usual, and *vice versa*. Some other specimens, from two to three years old, appeared to have remained in the rivers beyond the usual time. Sterile specimens of the Salmon cannot be externally distinguished from fertile ones of the same age.

Towards the end of the paper the author makes some remarks on immature specimens of the Scandinavian Charr. He distinguishes two forms of Charr—a larger one from Lapland, Lake Wetter and other large lakes, and a smaller one from the smaller lakes of Jemtland, Wermland, Småland and Norway; but he is inclined to regard them as modified forms of one and the same species, analogous to those of the River-, Lake-, and Migratory Trout.

The paper is accompanied by eight plates illustrative of the changes of the sexual organs and caudal fin. Entire figures of a male of a River-Trout and of a Migratory Trout are given on taf. 13. Fig. 1 of taf. 14 is said to represent a young fertile male of *Salmo salar*, but we should never have recognized in it the British *Salmo salar* of the same age and sex. It is not impossible that British and Continental naturalists may treat of very different fishes, although they use the same names.

Hr. Malmgren has examined the Salmonoids of Finland, entertaining the same opinion as Mag. Widegren with regard to the specific identity of the different European Salmonoids; but he considers it improper to refer these "varieties" to one species, without taking due notice of, and recording, the different forms occurring in nature*. Thus, what has been called a

* It would have been very proper if Hr. Malmgren had been guided by the same principle in his notes on Charr (Wiegman. Arch. 1864, p. 331).

species is represented as a variety by this author, who does not hesitate, as we shall see, to use binominal nomenclature for these "varieties." It is to be regretted that no serviceable descriptions are added, so that the species of that country remain in the same obscurity as before. He distinguishes

1. *Trutta salar* with two varieties :

a. The migratory form, ascending the rivers from the Gulfs of Bothnia and Finland, as well as from the White Sea.

b. A large lacustrine Salmonoid of Lake Ladoga had been compared with one of the Salmonoids of Lake Wener (*Salmo salar*, var. *lacustris*, Hardin) by Mag. Widegren, who declared them to be identical, and of the same species as the common Salmon. Hr. Malmgren agrees with him, inasmuch as he considers both to be the descendants of the Salmon of some former period; specimens of this Salmon remained in those lakes when they became separated from the sea; and the race of these individuals thus shut up from the sea underwent certain changes "in the course of thousands of years," which ought not to be overlooked, and which induce the author to propose for "this variety of *Trutta salar*" the name of *Trutta relictæ*.—The characters by which this "variety" is distinguished by Dr. Malmgren are of too trivial a nature to deserve space in this Record, except one, viz. that the ova of *Trutta relictæ* are considerably smaller than those of the Salmon.

2. *Trutta trutta* with three varieties.

a. The migratory form (*S. trutta*, auct.).

b. *Trutta lacustris*, with *S. ferox*, *S. microps*, &c. as synonyms. Differences in the size of the scales and of the teeth are of no value; the former vary much in different individuals, and the size of the teeth depends entirely on the particular food taken by the fish.

c. *Trutta fario*. Large examples and, again, young ones of the common Trout cannot be distinguished from specimens of the Sea-Trout of the same size; therefore the two species cannot be seriously maintained.

We might have been satisfied with giving a simple record of these novel views, if they had been written for ichthyologists only, who would at once perceive the fallaciousness of conclusions based upon facts which (as regards the Salmonoids mentioned) have evidently not been thoroughly examined, not perfectly understood, and which at all events have not been proved. But as they will be read by men less conversant with ichthyology, who may perhaps make use of them for their own special study, we cannot allow them to pass without comment.

According to Hr. Malmgren, the criterion of species would be the unity of characters as they appeared in a group of individuals living at a remote period, say in the Glacial period; not all

species retained the purity of their characters, but some of them, becoming exposed to a change of external conditions, underwent a corresponding change in a part of the original characters. Now, as this may have happened to only a certain number of the individuals of a species, the altered form of the present day is not entitled to the rank of species, but is to be considered a *variety*. Although we doubt very much whether zoologists would ever make practical use, for the distinction of species, of this doctrine even if it should prove true, we do not find it supported by the facts bearing upon this question.

1. According to the excellent researches of Professor Lovén, quoted above (p. 137), a certain number of arctic marine animals still survive in great depths of the Scandinavian lakes, from the period at which those lakes were separated from the Glacial Ocean; *they have not changed their characters*, but are smaller in size.

2. Profiting by this discovery, Hr. Malmgren finds that a number of certain marine fishes still inhabit the gulf of Bothnia, being the remnants of the arctic fauna of the period when the Baltic was a gulf of the Glacial Ocean. *They agree, in spite of the change of the water, with their brethren in the White Sea in every character, except in size.*

3. Therefore these two facts directly contradict the hypothesis that two Salmonoids inhabiting those lakes are the *modified* descendants of marine fishes, the true types of which are continued to the present day in those forms which, propagating their species under the original conditions, have remained unaltered.

Yet it may be said that some species changed their original characters, whilst others preserved them under all circumstances. To this we have no other method of replying than of entering into an examination of the characters which must have been affected in those lacustrine forms.

We have not seen specimens of the "*Trutta relicta*" from Lake Ladoga, but they are stated to be identical with those of Lake Wener, of which we have received splendid examples through Mr. Wheelwright; and although we cannot place full confidence, as regards specific identification or distinction, in Messrs. Widegren and Malmgren, who are so apt to confound species, our Wener specimens answer our purpose quite as well as those from Lake Ladoga would do. Now the one considered to be the descendant of the Salmon differs from that species, first, in having much smaller scales, the large-sized scales of the tail being one of the principal and most constant characters of the Salmon; secondly, in the number of pyloric appendages; and thirdly—as Hr. Malmgren observes—in the size of the *ova*. The last character will be considered very significant by all who may have a more extensive knowledge of fishes, as the size

of the ova is not only invariably the same in individuals of whatever size, but, as far as our experience reaches, is even often characteristic of the species of a genus.—We are unwilling to discuss the question whether such characters may have been gradually acquired by a species in the course of time; but even assuming that this has been the case in the Wener Trout, there is not the slightest evidence to show that it is the descendant of the Salmon, and not of some other extinct Salmonoid.

Further, how is it to be explained that those lakes, and a number of others, all over the northern hemisphere, are inhabited by that, we might say, fancifully distributed group of Salmonoids, the Charr, the origin of which cannot be deduced from a marine species? How is it that the "*Trutta relictae*" are found in a number of lakes with broad outlets into the sea, some of which certainly existed from the first period of their separation from the salt water? How is it that not one of the "*Trutta relictae*" has ever returned to the habits of its "fore-fathers," and descended to the sea, which became again, and now is accessible? If a marine animal is gradually acclimatized in fresh water, it degenerates in size, but the lacustrine Salmonoids of the different European lakes do not show themselves much inferior to the marine forms in this respect; and where they have perceptibly diminished in size, as in the Lake of Geneva, this has been the case within a very late period, and is the consequence of an increased destruction of them by man.

As regards the two lacustrine forms mentioned by Hr. Malmgren, the description of their characters is of the poorest kind. Important internal characters are not taken notice of at all; the difference in the size of the scales—one of the most constant and important characters in Salmonoids—is considered of no value; that of the size of the teeth is disposed of as being dependent on the food (all sportsmen will agree with him)! To have lumped together *Salmo trutta*, *S. ferax*, *S. lacustris* from the Lake of Constance, *S. microps*, &c. as varieties of *S. trutta*, is a proof that the author has not entered very deeply into the subject; we should go too far did we stop to point out here the distinctions, and may omit them, as the descriptions of these Salmonoids will form the subject of a separate publication.

Finally, as regards *Salmo fario*, we (and probably most ichthyologists) have again the misfortune to entirely disagree with Messrs. Widegren and Malmgren, who regard it as a degenerate variety of the Sea-Trout. The reason they assign, that young and very old River-Trout cannot be distinguished from Sea-Trout of the same age, may lie in the individuality of the observer. We confess to not having yet overcome the difficulties of distinguishing the different Sea-Trout (*S. trutta*, *S. cambricus*, &c.) in the Parr-state; but a young River-Trout may always be

distinguished from the Parr-state of any migratory Trout, at least as far as the British species are concerned. The two Scandinavian naturalists have not paid any attention to hybridism in the species observed by them, and as hybrids are probably of as common occurrence in Scandinavia as elsewhere, they may perhaps have examined hybrid specimens which confused their ideas altogether. It was long ago observed that in natural groups of animals the species of inferior size retain through their whole life characters which are peculiar to the young state only of the larger and more fully developed species. This is beautifully illustrated in the genus *Salmo*, and *S. fario* is one of those species in which characters of the young Sea-Trout and of the young Salmon are retained throughout life.

Salmo alpinus. Hr. Malmgren (Wieg. Arch. 1864, p. 328) calls the Scandinavian Charr *Salmo salvelinus*, being of opinion that the various Charr of Scandinavia are specifically identical with the "Sælbling" of South Germany; *S. umbla* is also referred as a synonym to *S. salvelinus*. He is surprised that Prof. Siebold asserts that *S. alpinus* from Lapland is different from *S. salvelinus*, but explains this by the circumstance that Prof. Siebold never had an opportunity of examining a Lap specimen. On p. 350, he denounces the British species established by the Recorder as so many additions to the synonymy.

If the author had been satisfied to give the results of his examinations of the Scandinavian fishes we should have felt ourselves bound to respect his opinion as to the specific unity of the Scandinavian Charr, of which we have seen very little, particularly if he had shown how he arrived at this opinion. But as he not only puts forward his assertions unsupported by a single fact, but also ventures upon ground entirely unknown to him (he has not had extra-Scandinavian specimens for comparison), his opinion may be considered to be of the same weight as that of Prof. Siebold on *S. alpinus*. It is a misfortune that, when the knowledge of the Salmonoids first began to be developed, a number of nominal species were created simultaneously with others which are really distinct; in consequence of this, Naturalists look with distrust upon every step in a similar direction. Add to this that it certainly requires good material, patient inquiry, and an experienced eye, to discover specific characters among the multitude of accidental and other variations, and we cannot be surprised that many zoologists will prefer to adopt Agassiz's opinion uttered in 1834, that all the Charr of Europe are specifically the same. If there are many more species of *Salmo* than Hr. Malmgren is inclined to admit (as the Recorder has been compelled to believe, from a long study of them "in nature," as well as in the collection), this will be merely an instance analogous to that of the genus *Coregonus*, of which numerous Scandinavian species are described by Hr. Malmgren. But then it is easier to perceive the characters of the species of the latter genus than those of *Salmo*, although one would scarcely have expected that the slightest doubt could be entertained as to the specific distinctness of the Irish Charr.

Osmerus eperlanus. The Smelt is found in all the larger lakes of Finland, and is common along the sea-shores. Malmgren, in Wieg. Arch. 1864, p. 339.

Coregonus. The Finnish species of this genus have been determined by

Hr. Malmgren (Wieg. Arch. 1864); on the whole he agrees with Mag. Widegren, that the Scandinavian species are more numerous than has been hitherto supposed, and that their synonymy is much confused; the species as distinguished by Mag. Widegren are adopted, excepting in one instance where two have been confounded; all the species are described: *C. lavaretus* (L.), p. 322; *C. oxyrhynchus* (L.), p. 323; *C. maræna* (Bl.), p. 324; *C. widegreni*, sp. n., p. 325, from the lakes Ladoga and Wetter; *C. nilssonii* (Val.), p. 326; *C. albula* (L.), p. 327; *C. megalops* (Widegren), p. 349; *C. pachycephalus*, sp. n., from Lake Ladoga, is only mentioned, not described, p. 350.

Percopsis hammondi, sp. n., Gill, Proc. Acad. Nat. Sc. Philad. 1864, p. 151, from Kansas.

CLUPEIDÆ.

Hr. Malmgren (Wieg. Arch. 1864, p. 341) enumerates the following species as occurring on the Finnish coasts:—*Cl. sprattus*, on the southern and south-western coasts; *Cl. harengus*, on the northern coasts; *Cl. harengus*, var. *membras*, commonly called "Strömling," in the White Sea and in the Gulfs of Bothnia and Finland; a larger variety of the "Strömling," perhaps a distinct species, on the southern and western coasts.

Harengula spilura, sp. n., Guichenot, in Maillard, Notes sur l'île de la Réunion, App. p. 16, from Bourbon.

Scleropyges is the name of an Australian genus of fishes, described by Dr. Günther in Ann. & Mag. Nat. Hist. 1864, xiv. p. 195, closely allied to, or identical with, the Bornean *Osteoglossum*. *Scl. leichardti*, sp. n., p. 196, pl. 7, from Queensland.

SCOMBERESOCES.

Eurocætus californicus, sp. n., Cooper, Proc. Calif. Acad. Nat. Sc. iii. p. 93, fig. 20.

MURÆNIDÆ.

Dr. Bleeker, simultaneously with the fourth volume of his great work, containing the Eels, has published a revision of the systematic arrangement and of the synonymy of this family (Nederl. Tydschr. Dierk. 1864, p. 113). This new arrangement differs considerably from that proposed by Dr. Kaup, as regards the divisions and subdivisions; quite a large number of genera established by the latter gentleman have been rejected by Dr. Bleeker, who, as we stated above, is in the habit of creating genera in the most liberal manner. The *Symbranchidæ* are excluded as not being true Eels. As the 'Atlas Ichthyologique' contains the most complete view of the subject, we give the following abstract from this work, without referring to the memoirs mentioned. All the species described, 132 in number, are beautifully illustrated.

- I. ANGUILLOIDEI, with the genus *Muræna* = *Anguilla* (auct.).
- II. SYNAPHOBANCHOIDEI, with the genus *Synaphobranchus* (Johns.).
- III. PTYOBANCHOIDEI, with three genera: *Moringua* (Gray) = *Rataboura*

(Gray)=*Ptyobranchus* (M'Cl.); *Pseudomoringua*, g. n. (type *Moringua lumbricoidea* (Richards.); *Aphthalmichthys* (Kaup).

IV. CONGROIDEI.

A. *Nemichthyiformes*, with the genus *Nemichthys* (Richards.)=*Leptorhynchus* (Lowe)=*Belonopsis* (Brandt).

B. *Nettastomiformes*, with the genus *Nettastoma* (Rafin).

C. *Congriformes*.

Phalanx a. *Murænesoces*, with four genera: *Hoplunnis* (Kaup); *Oxyconger* (Blkr.), type *Conger leptognathus* (Blkr.); *Murænesox* (M'Cl.); *Brachyconger* (Blkr.), type *Conger savanna* (Cuv.).

Phalanx b. *Congri*, with four genera: *Conger* (Klein); *Ophisoma* (Swains.)=*Congermuræna* (Kaup); *Uroconger* (Kaup)=*Congerodon* (Kaup)=*Gnathophis* (Kaup); *Neoconger* (Girard).

D. *Myriiformes*, with three genera: *Myrophis* (Lütken); *Myrus* (Kaup)=*Echelus* (Rafin.); *Murænichthys* (Blkr.).

V. OPHISUROIDEI.

Phalanx a. *Leptognathi*, with the genus *Leptognathus* (Swains.)=*Leptorhynchus* (Smith), type *Ophisurus serpens* (Lacép.).

Phalanx b. *Brachysomophides*, with four genera: *Brachysomophis* (Kaup); *Achirophthichthys* (g.n.), type *A. typus*; *Mystriophis* (Kaup); *Crotalopsis* (Kaup).

Phalanx c. *Ophisuri*, with six genera: *Cirrhimuræna* (Kaup); *Leinramus* (Blkr.)=*Stethopterus* (Blkr.), type *Muræna colubrina* (Bodd.); *Ophichthys* (Ahl), including the following Kaupian genera—*Centrurophis*, *Pæcilocephalus*, *Microdonophis*, *Cæcilophis*, *Herpetoichthys*, *Elapsopsis*, *Echiopsis*, *Scytalophis*, *Leptorhinophis* et *Cryptopterus*; the author describes 20 species, one of which is considered to be new, viz. *Ophichthys singapurensis*, p. 52; *Pisoodonophis* (Kaup), with a new species, *P. moluccensis*, p. 72, from Amboyna; *Ophisurus* (Lacép. part.), type *O. ophis* (Lacép.); *Callechelys* (Kaup).

Phalanx d. *Sphagebranchi*, with two genera: *Sphagebranchus* (Bl.)=*Anguisurus* et *Lamnostoma* (Kaup); *Apterichthys* (Dum.)=*Ophisurophis* (Kaup).

VI. GYMNOTHORACOIDEI.

Phalanx a. *Murænoiphides*, with five genera: *Echidna* (Forst.)=*Pæcilocephis* (Kaup); *Gymnothorax* (Bl.)=*Muræna* (Cuv.), including the following Kaupian genera—*Sidera*, *Enchelynassa*, *Eurymyctera*, *Enchelycore*, *Limamuræna*, *Thyrsoidea* (part.), *Polyuranodon*, et *Tæniophis*; *Priodonophis* (Kaup)=*Pseudomuræna* (Johns.); *Strophidon* (M'Cl.), type *Str. brummeri* (Blkr.); *Thyrsoidea* (Blkr.), type *Th. macrurus* (Blkr.).

Phalanx b. *Ichthyophides*, with two genera: *Gymnomuræna* (Lacép.)=*Ichthyophis* (Less.)=*Uropterygius* (Rüpp.); *Channomuræna* (Richards.).

Anguilla vulgaris. Hr. Malmgren fixes 64° 30' lat. N. as the northern limit of the Eel in Finland. Wieg. Arch. 1864, p. 303.

[*Anguilla*] *Muræna manillensis*, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 31, from Manilla.

Saurenehelys cancrivora, g. et sp. n., allied to *Nettastoma*, but with the

posterior nostril situated above, and not behind, the eye. Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 397; hab. — ?

Myrophis punctatus (Lütken) is identical with *Myrophis longicollis* (Cuv.), according to Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 397.

Echelus microchir, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 40, from Celebes.

Muraenichthys macrostomus, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 38, from Amboyna; *Muraenichthys microstomus*, sp. n., Bleeker, *ibid.* p. 39, from Celebes.

Ophichthys polyophthalmus, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 43; *Ophichthys melanochir*, sp. n., Bleeker, *ibid.* p. 44; *Ophichthys amboinensis*, sp. n., Bleeker, *ibid.* p. 45: all three from Amboyna.—*Ophichthys amoyensis*, sp. n., Bleeker, *ibid.* p. 61, from Amoy.

Pisodonophis oligodon, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 59, from Amoy.

Ophirus californiensis, sp. n., Garrett, Proc. Calif. Acad. Nat. Sc. iii. p. 66, fig. p. 98, from Lower California.

Sphagebranchus lumbricoides, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 46, from Timor.

Gymnothorax. Dr. Bleeker has described the following new species in Nederl. Tydschr. Dierk. 1864: *G. rhodocephalus* from Amboyna, p. 50; *G. formosus* from Ceram, p. 51; *G. chilospilus* from various islands, p. 52; *G. margaritophorus*, from Amboyna, p. 53.

Priodonophis moluccensis, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 48, from Amboyna.

Strophidon polyodon, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 47, from Amboyna.

Gymnomuraena macrocephalus, sp. n., Bleeker, Nederl. Tydschr. Dierk. 1864, p. 54, from Amboyna.

Gymnotus. Mr. Gill names now the Electric Eels *Electrophorus*, retaining the name of *Gymnotus* for *Carapus*. Proc. Acad. Nat. Sc. Philad. 1864, p. 151.

LEPTOCEPHALI.

In anticipation of a more extended memoir, Mr. Gill expresses his unqualified belief in the opinion that these fish are simply larval forms. He is almost certain that the typical *Leptocephali*, at least, are the young of Congers, and that *L. morrisii* is the young of *Conger vulgaris*. *Hyopropus messinensis* (Köll.) appears to be the larval form of *Nettastoma melanura*. *Stomiasunculus* resembles, in general features, a larval Clupeoid, about three days old, in which the ventral fins have not yet appeared. *Esunculus* is likewise a larva, and *Porobronchus* (Kaup) is, perhaps, related to *Fierasfer*. Proc. Acad. Nat. Sc. Philad. 1864, p. 207.

Leptocephalus (*Diaphanichthys*) *brevicaudus*, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 399, from the sea between Maybata and Luzon.

Prof. Peters considers the question settled, that the *Leptocephali* are not the larvæ of *Cepola* or of other "Band-fishes."

PLECTOGNATHI.

Mola. Prof. Steenstrup and Dr. Lütken have critically examined the species of this genus and their history, on the occasion of a gigantic specimen of *Mola nasus* (Rafin.) being thrown on shore near Sevede in Denmark. They admit only two other well-determined species, viz. *Mola retzii* (Rañz.) and *Ranzania truncata* (Retz.). Young specimens differ from the old ones in form, physiognomy, and surface of the integuments, which circumstance has induced Swainson, Dekay, and Gill to form distinct genera and even families for them (*Molacanthus*, *Acanthosoma*, *Molacanthidæ*). Cefvers. Dansk. Vidensk. Selsk. Förhandl. in 1863, p. 36.

Pilonotus amboinensis, sp. n., Bleeker, Tydschr. Nederl. Ind. 1864, p. 180, from Amboyna.

LOPHOBRANCHII.

Hr. Malmgren mentions *Syngnathus typhle* and *Nerophis ophidion* as occurring on the Finnish coasts. Wiegman. Arch. 1864, p. 343.

GANOIDEI.

Lepidosteus. Prof. Winchell enumerates 15 species of this genus, one of which is described as new — *Cylindrostheus oculatus* from Michigan. Proc. Acad. Nat. Sc. Philad. 1864, p. 183.

SQUALIDÆ.

M. du Bocage, Proc. Zool. Soc. 1864, June 14, enumerates the sharks of Dr. Gray's group *Acanthiana*, which are found on the coast of Portugal, and describes the following new species and genera:—

Centrophorus lusitanicus, p. 260, fig. 1; *C. crepidalbus*, p. 261, fig. 2; *C. crepidater*, p. 261, fig. 3.

Centroscymnus, g. n., p. 263: Teeth of the upper jaw very similar to those of *Scymnus*; those of the lower jaw as in *Centrophorus*. Dorsal fins narrow, short, with inconspicuous spines. *C. cælolepis*, sp. n., fig. 4.

Scymnodon, g. n., p. 263: Teeth of the upper jaw as in *Scymnus*; lower jaw with a single median tooth, the teeth adjoining it erect, and those towards the angle of the mouth gradually decumbent. Dorsal fins narrow, short, with minute spines. *S. ringens*, sp. n., fig. 5.

Crossorhinus tentaculatus, sp. n., Peters, Monatsber. Acad. Wiss. Berl. 1864, p. 123, from Adelaide.

Carcharias menisorrhæ (Müll. & Henle) is the type of a distinct genus, according to Mr. Gill, Proc. Acad. Nat. Sc. Philad. 1864, p. 264. He names it *Platypodon*, and refers to it *Squalus tiburo* (Poey), *S. acronotus* (Poey), and *S. obscurus* (Les.).

Galeus. Mr. Gill mends this name into *Eugaleus*, Proc. Acad. Nat. Sc. Philad. 1864, p. 148.

Mustelus. Mr. Gill describes two new species, viz. *M. californicus* and *M. dorsalis*, the latter from Panama, and proposes for *M. lævis* the name of *Pleuracromylon lævis*. Proc. Acad. Nat. Sc. Philad. 1864, p. 148.

Triakis. According to Mr. Gill, *Mustelus felis* (Ayres) should be referred to this genus. Proc. Acad. Nat. Sc. Philad. 1864, p. 149.

Polyprosopus (Couch). Mr. Gill expresses his conviction that this fish belongs to the genus *Cetorhinus* or *Selache*, and that the differences observed are probably due to distortion or defective observation. Proc. Acad. Nat. Sc. Philad. 1864, p. 207.

Cestracion phillipii. A detailed description with figures of the Port Jackson Shark has been given by Strüver, Nov. Act. Acad. Carol. Leop. Nat. Cur. xxiii. 1864.

Notorhynchus (Ayres). Mr. Gill makes some remarks on this genus, and distinguishes a *Notorhynchus borealis* besides *N. maculatus*. Proc. Acad. Nat. Sc. Philad. 1864, p. 149.

RAJIDÆ.

Raia batis. Prof. Wyman has made investigations into the development of this species, Mem. Amer. Acad. 1864, ix. p. 31. The more important conclusions arrived at are stated as follows at the close of the paper (reprinted in Ann. & Mag. Nat. Hist. 1864, xiv. p. 399):—

(1.) The yolk-case is formed in the glandular portion of the oviduct, and is begun previously to the detachment from the ovary of the yolk which is to occupy it.

(2.) The embryo, before assuming its adult form, is at first eel-shaped and then shark-shaped.

(3.) The embryo is for a short time connected with the yolk by means of a slender umbilical cord; the cord afterward shortens, and the young skate remains in contact with the yolk until the end of incubation.

(4.) There are seven branchial fissures at first: the foremost of these is converted into the spiracle, which is the homologue of the Eustachian tube and the outer ear-canal; the seventh is wholly closed up, and no trace remains; the others remain permanently open.

(5.) There are no temporary branchial fringes or filaments on the first and seventh arches; on the others the fringes are developed from the outer and convex portion of the arch, and are not at first prolongations of the internal gills.

(6.) The nostrils, as in all Vertebrates, consist at first of pits or indentations in the integuments; secondly, a lobe is developed on the inner border of each; and finally the two lobes become connected, and thus form the homologue of the fronto-nasal protuberance. The transitional stages correspond with the adult conditions of them in other species of Selachians.

(7.) The nasal grooves are compared with the nasal passages of air-breathing animals, and the cartilages on either side of these to the maxillary and intermaxillary bones.

(8.) The foremost part of the head is formed by the extension of the facial

disk forward. While this extension is going on, the cerebral lobes change their position from beneath the optic lobes to one in front of them.

(9.) Two anal fins, one quite large and the other very small, are developed, but both are afterwards wholly absorbed.

(10.) The dorsals change position from the middle to the end of the tail. At the time of hatching, however, there is still a slender terminal portion of the tail, which is afterwards either absorbed or covered up by the enlarged dorsals, as they extend backward.

Raja clavata. M. Gervais has observed a case of notomely in this species; the specimen had a pair of supernumerary pectoral fins on its back. Compt. Rend. 1864, ii. p. 802.

Pteroplatea marmorata, sp. n., Cooper, Proc. Calif. Acad. Nat. Sc. iii. p. 112, fig. 25, from the coast of California.

Urolophus halleri, sp. n., Cooper, Proc. Calif. Acad. Nat. Sc. iii. p. 95, fig. 21, from the Coast of California.

Trygonoptera javanica, sp. n., Martens, Monatsber. Acad. Wiss. Berl. 1864, p. 260. The genus *Trygonoptera* (Müll. & Henle) was known from a drawing only; Dr. von Martens, having discovered this second species, says that the teeth of this genus are not exactly acute, and that it has a rayed terminal caudal fin.

LEPTOCARDII.

Myxine glutinosa. Prof. Steenstrup has discovered a female specimen, in which the eggs present a very different appearance from those hitherto found in these fishes, and are evidently in a state of maturity. They are proportionally much thicker and shorter, ovate in form, about 15^{mm} long, and 8^{mm} broad, enveloped in a horny case which at each end is provided with a bundle of short threads, each thread ending in a treble hook. The eggs are attached to each other by means of these hooks, and after being deposited they probably fix themselves by the same means to other objects. Œfvers. Dansk. Vidensk. Selsk. Förhandl. in 1863, pp. 233-238, with a woodcut.

Branchiostoma lanceolatum. Prof. Steenstrup observes, with regard to the account given of this fish in the third edition of Yarrell's British Fishes, 1, that the specimen from the Moray Firth, stated to have been 7 inches long (p. 4), cannot have been a *Branchiostoma*, but was either a *Leptocephalus morrisii*, or more probably a young *Myxine*; 2, that the whole article of Mr. Wilde on the habits of this species, inserted on pp. 6 & 7, refers not to a fish, but to a *Salpa*, probably *Salpa runcinata* (Cham.). Œfvers. Dansk. Vidensk. Selsk. Förhandl. in 1863, p. 238.

MOLLUSCA

BY

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By far the greater portion of the publications on this class of animals is devoted to descriptions of species belonging to types more or less previously known, and more especially of their shells, as is usually the case in this department of Zoology. Fortunately the number of species described as new, but without indication of their habitat, is not very large, so that our knowledge of the geographical distribution of the Mollusks is also advanced by most of these papers, especially by those in which an enumeration of all the species found in the same district is added. The faunas of Eastern Asia and Australia have been more particularly enriched in the course of last year. The systematic arrangement has not been essentially changed, but a considerable number of new genera (perhaps rather too many) have been introduced into science.

A. THE GENERAL SUBJECT.

1. *General Works in Progress.*

REEVE, L. *Conchologia Iconica*, or figures and descriptions of the shells of molluscous animals, illustrated chiefly from the Cumingian Collection. London, L. Reeve & Co., 4to.

As far as we know, four double parts have been issued in the year 1864, viz. Nos. 236-243, containing the genera *Venus*, *Tapes*, *Meroë*, *Cytherea* (*Cytherea* in a restricted sense = *Meretrix* of Gray and Deshayes), *Circe*, *Dione*, *Solarium*, *Marginella*, *Ancillaria*, and *Sigaretus*.

The character of this work, which no conchologist can dispense with, is so well known, that a description of its object and extent is unnecessary. We have been obliged to enumerate as new all those species to which no reference is added in the letter-press, although we have reason to believe that some of them at least have been previously described elsewhere, under the same name.

Dr. H. G. BRONN's *Klassen und Ordnungen des Thierreich's*, wissenschaftlich dargestellt in Wort und Bild. Fortgesetzt von W. KEFERSTEIN. Leipzig und Heidelberg, 8vo.

Parts 32-38 of volume iii., containing the *Malacozoa*, bear the date of 1864. They contain the history, development, and classification of the *Gasteropoda Prosobranchiata* (Vorder-Kiemer).

The author commences with the *Chitonidæ*, and treats of the *Cyclobranchia*, *Ctenobranchia*, *Neurobranchia* (= *Pulmonata operculata*), of their habits, geographical and geological distribution, and of the general characters and classification of the *Pulmonata* (i. e. *Pulmonata inoperculata*). These parts are illustrated by 17 plates (one of which is a geographical map), and form a judicious and most instructive manual of malacology in its present state, which will be very useful, not only to the beginner, but to every one who wishes to inform himself of the latest discoveries in this branch of science.

2. Papers published in Journals.

a. Development and Growth.

LALLEMANT, CH. Sur le développement et l'acclimatation de quelques coquilles marines. Bull. Soc. Climatol. Algérienne, 1^{ère} année 1864, no. 1; and in Journ. Conchyl. p. 306.

Venus verrucosa is supposed to be adult at an age of eight months, having a length of 4-5 cm. The author has continued his observations for eight years; he observed that small examples thrown on the beach after a gale of wind never exceeded a length of 10 mm. in the month of December; in February they were larger, 2-2½ cm. long; and, finally, in the months of April and May specimens of the normal size only are found.

FISCHER, P. Note sur la rapidité de l'accroissement des *Mytilus*. Journ. Conch. 1864, pp. 5-7.

Mytilus edulis attains, under favourable circumstances, the size of 100 mm. within a year.

AUCAPITAINE, H. Note sur le développement des mollusques dans le port de Toulon. Journ. Conch. p. 314.

Oysters of 8-12 mm. in length, and Balani of 8-10 mm. at the base, were found in a basin of the docks of Toulon, which had been filled with water for thirty-two days only; the rapid growth of these animals is probably to be attributed to the quality of the water, which receives all the effluvia of the town, and nourishes a large number of little Crustaceans.

b. Teratology.

FISCHER, P. Note sur une monstruosité de l'animal du *Patella vulgata*. Journ. Conch. 1864, p. 89.

This case is founded on an observation by M. Bert. The tentacle and the eye of the left side were double. Duplicity of the tentacles has also been observed by others in the family of *Limnæacea*, and duplicity of the eyes by Hr. Fischer himself in *Submarginula*. The present case is remarkable, because the monstrosity is confined to one side only.

c. *Geographical Distribution and Migration.*

MARTENS, E. VON. Bemerkungen über natürliche Gruppierung und geographische Vertheilung der gedeckelten Land-schnecken. [Remarks on the geographical distribution of the *Pulmonata operculata*.] Malac. Blätt. 1864, pp. 131-144.

With regard to the contents of this paper, and of another by Mr. BLANFORD, we refer to p. 197, and to p. 237 of the systematic part of this Record.

AUCAPITAINE, H. Expérience sur l'expansion possible de quelques mollusques terrestres au-delà des eaux salées. Separate publication (8vo, pp. 12) from the Gazzetta ufficiale del regno d'Italia. Torino, March 9, 1864; communicated in Journ. Conch. pp. 302-304.

One hundred land-shells were kept immersed in sea-water during a fortnight, and twenty-seven of them revived afterwards. The presence of an operculum seems to be important in this respect, as out of twelve *Cyclostoma elegans* eleven revived, whereas of all the other species, which were inoperculated land-shells, more than half of the number of specimens subjected to the experiment perished, except *Pupa cinerea*, of which five specimens out of six revived (this may be ascribed to the numerous teeth round the aperture). It is remarkable that a considerably smaller number of the larger species survived the experiment than of the smaller ones, and it is especially worthy of note that no specimen of the genus *Helix*, not even one out of six of *Helix aperta*, shut up by their solid epiphragma, stood the test. Notwithstanding these experiments, M. Crosse appears to be right in attaching but very slight importance, as far as the distribution of the species of Land-snails is concerned, to such adventitious occurrences as their falling into the sea and being transported by currents to other shores.

The immigration of *Dreissena polymorpha* into parts of Europe where it was originally unknown, has continued during the year 1864. Its occurrence in tributaries of the Rhine, Mosel, and Main is recorded by Messrs. Noll, Mandel, and Greim (Zoolog. Gart. Frankf. 1864, pp. 30, 89, and 124), with the addition of the dates of its first detection (1855-61); its presence in the middle part of the Rhine, at Knielingen near Carlsruhe, is testified by Hr. Kreglinger (Verh. ntrw. Verein. Karlsru. vol. i.); its appearance higher up in the Rhine, near Huningue, where it was found by Hr. Seul, is announced by Hr. P. Merian (Verh. ntrf. Ges. Basel, iv. 1864, p. 94); and, finally, its immigration into the Loire near Orleans, by way of canals, in 1864, has been observed by Capt. Morlet (Journ. Conch. pp. 309-314). Towards the end of last year the Recorder collected all the facts and observations

concerning the immigration (or rather importation) of this mollusk which had come to his notice, but the paper was not published until this year (Zool. Gart. Frankf. 1865, pp. 50-59, 89-97).

Dreissena is, according to Hr. Merian (l. c.), accompanied by *Neritina fluviatilis* in the Upper Rhine, where it never occurred before. The Recorder is enabled to confirm this by a communication from Prof. Braun, who says that it was not found in the Rhine near Carlsruhe some twenty years ago.

Hr. Kreglinger, in his List of the Shells of Baden, states that *Helix austriaca* (Mhlfd.), a species peculiar to Eastern Europe, was once found alive in a garden at Carlsruhe, having been evidently imported by some accident. On the other hand, he mentions *Margaritana margaritifera* (L.) as occurring near Heidelberg, and as "originally imported." This, we think, is also the case with *Clausilia itala*, var. *brauni* (Charp.), which has been long known to occur in one locality of the warmest part of the country, Weinheim, where an excellent wine is grown.

B. BIBLIOGRAPHY.

BINNEY, W. G. Bibliography of North American Conchology previous to the year 1860, prepared for the Smithsonian Institution. Part I. American authors. Smithsonian Miscellaneous Collections, vol. v. Washington, 1864, 8vo.

The object and contents of this extensive publication may be given in the author's own words:—"It is intended to give a full account of the writings of American conchologists generally, separated into three sections: A. American descriptions of North American mollusks; B. American descriptions of foreign mollusks; C. Descriptions of foreign species by American authors in foreign works. It will be seen that each separate work or paper on the recent conchology of North America is taken up, its title and date given, its author's name, and a *list of species therein described, or in any important manner referred to*, indicated, together with their synonymy, locality, and the volume, page, plate, and figure relating to them. For their value as contributions to our knowledge of geographical distribution I have also quoted all the local lists of species without descriptions. The geographical limits to which I have confined my work are the whole continent of North America, including Greenland and the Arctic regions on the north and in the south the Mexican States of Chiapas and Tabasco, excluding the fauna of Panama and the West Indies."

RAFINESQUE, C. S. The complete writings of Constantine Smaltz Rafinesque on recent and fossil Conchology. Edited by W. G. BINNEY and G. W. TRYON. New York, 1864, 8vo, pp. 104, with 3 plates.

In this reprint even the original pagination is retained. It will be of value to all who regard the restitution of priority as one of our principal duties, however obscure and incorrect the author, and however small his influence upon his contemporaries may have been.

C. CONTRIBUTIONS TO FAUNAS.

a. Land and Freshwater Mollusca.

1. Europe.

MÖRCH, O. A. J. Synopsis Molluscorum terrestrium et fluvialium Daniæ; or Fortegnelse over de i Dannemark forekommende Land- og Forskvandsbløddyr. Naturh. Foren. Vidensk. Meddel. for 1863. Kjöbenh. 1864.

A most elaborate and instructive paper, not only with regard to the local occurrences, but also to the arrangement of genera and the distinction of varieties. Particularly surprising and new is the occurrence of *Cyclostoma elegans* in Jutland; hitherto only dead specimens have been found.

KREGLINGER, C. Verzeichniss der lebenden Land-und Süsswasser-Conchylien des Grossherzogthums Baden [List of the living land and freshwater shells of the Grand Duchy of Baden]. Verhandl. naturwiss. Vereins Karlsruhe, vol. i. 4to, pp. 10: written at the same time as a little work with similar contents, by A. GYSSER, Die Mollusken-Fauna Badens. Heidelberg, 1863, 8vo, but published a little later.

One hundred and twenty species, not including the slugs, of which eleven species are enumerated by Hr. Gysser. The following species which are not generally distributed over Germany are of particular interest: *Cyclostoma elegans*, *Pomatias maculatus*, *Helix carthusiana* (Müll.), *H. sylvatica* (Drap.), *H. villosa* (Drap.), *H. cobresiana* (Alten), *Clausilia itala* var. *braunii* (Charp.). *Pupa quadridens* is added by Hr. Gysser. A comparative list of the shells of two neighbouring countries shows that Baden has seventeen species more than Würtemberg, and two more than Nassau. For, on the one hand, it possesses several species which properly belong to the Alpine and Subalpine Fauna, and probably have been carried down by the Rhine, as, indeed, in Baden they are not found beyond a certain distance from the banks of the river; for instance, *Helix villosa*, *H. cobresiana*, and *H. sylvatica*. On the other hand, some other species which have a wide geographical distribution in western and southern Europe, are very local in Germany, occurring chiefly in the mild climate of the valley of the Middle Rhine; such species are *Cyclostoma elegans*, *Helix carthusiana*, and *Pupa quadridens*.
1864. [VOL. I.]

TASLÉ. Catalogue des mollusques observés dans le département de Morbihan (Brittany). Vannes, 1864, 8vo, pp. 24; from Bulletin Polymathique du Morbihan.

Contains sixty-one land-mollusks and thirty-nine freshwater shells. Three species of *Testacella* are mentioned.

BOURGUIGNAT, J. R. Malacologie de la grande Chartreuse (Dauphiné). Paris, 1864, gr. 8vo, with 9 lithographic views of the country, and 8 coloured plates representing shells and animals.

Eighty species are enumerated, six of which are new. All the publications on the mollusks of this country are critically reviewed. Descriptions of the anatomy of *Helix alpina*, *fontenillii*, and *depi-lata* are added.

BOURGUIGNAT, J. R. Malacologie d'Aix-les-Bains (Savoy). Paris, 1864, 8vo, with 3 plates.

The author gives first a physico-geographical sketch of the country, and reviews the publications of his predecessors; then follows a very detailed synopsis of the molluscous animals of this part of Savoy, which is very rich in freshwater species. Three new species are described. Of the rarer ones we may mention the following:—

Limax silvaticus (Drap.), *Vitrina major* (Fér.) = *audebardi* (Pfr.), *Zonites pilaticus* (Bourg., described in the previous year in "Malacologie du lac des Quatre-cantons"), *Z. dumontianus* (Bourg.), *Z. subterraneus* (Bourg.), *Helix silvatica* (Drap.), *H. carthusiana* (Müll.), *H. lavandulae* (Bourg.), *Balea deshayesiana* (Bourg.), *Clausilia lineolata* (Held), *Pupa multidentata* (Oliv.) = *variabilis* (Drap.), *P. umbilicata*, var. *sempronii* (Charp.), *Carychium tridentatum* (Risso), *Planorbis crosseanus* (Bourg.), *Cyclostoma elegans* very common, *Neritina fluviatilis* absent in most parts of Switzerland. Ten species of *Unio* are distinguished!

STABILE, J. Mollusques terrestres vivants du Piémont. Milan, chez l'auteur, Rue St. Maurizio, no. 3422. 1864, 8vo, pp. 142, with 2 plates.

Peculiar to this country are *Clausilia diodon*, *alpina*, *thomasi*, *mella*, and *Pupa mortilleti*; *Testacella*, *Daudebardia* and *Pomatias* are absent.

MARTENS, E. VON. Some remarks on the specific determination of the land and freshwater shells collected in the Balearic Islands by Mr. Homeyer. Mal. Blätt. p. 161.

WALDERDORFF, COUNT DE. Systematisches Verzeichniss der im Kreise Cattaro im südlichen Dalmatien, mit Ausnahme der Biela Gora, und in einigen angrenzenden Theilen von Montenegro und Türkisch Albanien vorhandenen Land-

und Süßwasser-Mollusken. Verh. zool. bot. Ges. Wien, 1864, pp. 503-514. [Systematic list of land- and fresh-water-shells found in Cattaro (a district of Southern Dalmatia), with the exception of the Biela Gora, and in some of the adjoining parts of Montenegro and Turkish Albania.]

PFEIFFER, L. Descriptions of seven new species of land-shells from the collections of H. Cuming, Esq. Proc. Zool. Soc. 1864, pp. 603-605.

Species of *Helix* and *Clausilia* from the island of Crete.

2. Northern Africa and Western Asia.

BOURGUIGNAT, J. R. Malacologie de l'Algérie, ou histoire naturelle des animaux mollusques terrestres et fluviatiles recueillis jusqu'à ce jour dans nos possessions du nord de l'Afrique. Quatrième fascicule, Janvier 1864, et cinquième fascicule, Avril 1864. Paris, 4to, with 22 plates representing all the species mentioned*.

We mention here some of the species, the occurrence of which in Algeria was not yet, or at least not generally, known: *Bulimus fasciolatus* (Olivier), pl. 1. figs. 22-24 (this is the shell which has been taken by some other authors for *B. radiatus*); *B. decollatus* (L.), attaining to 25-30 mm. in length and to 10-11 in diameter, pl. 1. figs. 1-21; *Clausilia bidens* (L.) var. *virgata* (Jan) and *Cl. letourneuxi*, sp. n., both found near Algiers in the alluvial soil of the little ravine of Chabet-Beinan near Cape Cascino by Messrs. Letourneux and Poupillar; a third *Clausilia* of Northern Africa is *Cl. tristrami* Pfr.; [a fourth, *Cl. plicatula*, Drap., is found on the borders between Marokko and Algiers, as stated by Morelet, Journ. Conch. p. 135].

The following European species of *Pupa* have been found in Algeria:—

P. polyodon (Drap.), with a var. *minor* (= *ringicula*, Mich.), pl. 5. f. 14-18; *P. Brauni* (Rossm.), f. 28-34; *P. gonistoma* (Küster), f. 35-38; and *P. muscorum* (L.), pl. 6. f. 20-24; also *Vertigo minutissima* (Hartm.) = *muscorum* (Drap.), pl. 6. f. 28-32. Three species of *Cyclostoma* have been long known as Algerian: *C. sulcatum* (Drap.), *C. mamillare* (Lam.) = *voltzianum* (Mich.) (*Leonia*, Gray), and *C. ferrugineum*, Lam. (*Tudora*, Gray): the first inhabits almost the whole eastern part of Algeria, the second seems peculiar to the province Oran, the third has never been received by M. Bourguignat directly from the French possessions in Northern Africa. The following European species of *Limnæus* are also Algerian: *L. auricularius* (L.), including as variety *L. trencleonis* (Gassies), *L. limosus* (L.) = *ovatus* (Drap.), *L. palustris* (Müll.), *L. glaber* (Müll.) = *elongatus* (Drap.), and *L. truncatulus* (Müll.) = *minutus* (Drap.). Eleven species of *Ancylus* are distinguished by the author, all having been described in former papers, and not figured in the parts we have seen: *simplex* (Buchoz), Bourg. = *fluviatilis*, auct.; *striatus* (Webb et

* We have not seen the sixth and last fasciculus, which will contain the introduction, the text of the *Melaniadæ*, the *Bivalvia*, and the plates representing *Ancylus*, *Cyclostoma*, *Pahudinidæ*, and *Sphæriadæ* (*Cycladæ*).

Berthelot) = *costulatus* (Küster), *strictus* (Morelet), *caliculatus*, *gibbosus*, *raymondi*, *platylenus*, *brondeli*, *epipedus*, and *peraudieri*.

Further may be mentioned as Algerian our common *Bithynia tentaculata* (L.) and the Indo-African *Melania tuberculata* (Müll.).

The numerous species of *Ferussacia* [*Cionella*], *Cæcilianella*, *Planorbis*, *Physa*, and *Valvata*, and some others, being either new or doubtful, will be mentioned hereafter in the special part of our Record.

BOURGUIGNAT, J. R. Mollusques terrestres et fluviatiles recueillis par M. H. Duveyrier dans le Sahara. Paris, 1864, gr. 4to, with 6 plates, forming part of the Supplement to the work of M. Duveyrier entitled "Les Touaregs du Nord."

Most of the species observed in the Sahara and in the southern part of the vice-royalty of Tunis are nearly allied to forms of the Mediterranean fauna. The number of species and specimens is not large; some of them have been found in a sub-fossil state only. The traveller has been more and more impressed, during his progress into this desert, with the probability of the supposition that, at a period not very remote from ours, it was covered by the ocean.

BOURGUIGNAT, J. R. Mollusques nouveaux, litigieux ou peu connus. Quatrième fascicule, imprimé à 100 exemplaires. Paris, Mars 1864, 8vo, with 7 plates.

Contains descriptions and good figures of *Helix ehrenbergi* var., *Helix spiriplana* (Olivier) and of some species nearly allied to it, and finally some species of *Ferussacia* with a complete list of the species of this genus as understood by the author. Most of the new species are from Syria.

3. Central Asia.

MARTENS, E. von. Drei centralasiatische Schnecken [collected by the Russian traveller Semenov]. Pfr. Mal. Blätt. pp. 114-119.

ARCHER, S. Letter to Mr. Woodward, dated from Rawal Pindee in the Himalayas. Proc. Zool. Soc. 1864, p. 69.

Vitrina flemingi, *Bulimus* sp. [probably *buliminus*, allied to *siamensis*], *Limnaea stagnalis*, and *Cyrena* sp. occur at an elevation of about 5000 feet.

4. China and Japan.

CROSSE, H., et DEBEAUX. Description d'espèces nouvelles de Shanghai et du nord de la Chine. Journ. Conch. 1864, pp. 316-320.

MARTENS, E. VON. *Helix friedeliana* from Japan. Monatsb. Akad. Wiss. Berlin, 1864, July, p. 523.

5. Continental India.

BLANFORD, W. T. On the Classification of the *Cyclostomacea* of Eastern Asia. Ann. & Mag. Nat. Hist. 1864, xiii. pp. 441-465.

This paper coincides in time, and partly in its contents, with one published by the Recorder in the "Malacoz. Blätter," pp. 131-144, on the same subject, but has a more systematic tendency. According to the experience gathered by the Recorder in the East-Indian archipelago, he considered the boundary-line between the Eastern and the Europæo-African series of Cyclostomacea more sharply defined than appears to be the case from the latest discoveries, by which the presence of the European genus *Pomatias* in the Transgangetic peninsula, and of the African *Otopoma* in Western India, is proved. Nevertheless the Recorder does not believe that the distinction pointed out in his paper is overthrown by a few exceptions.

THEOBALD, W. Notes on the variation of some Indian and Burmese *Helicidæ*, with an attempt at their rearrangement, together with descriptions of new Burmese Gasteropods. Journ. As. Soc. Beng. 1864, pp. 238-250.

The author proposes to unite into one species, but to distinguish as varieties with separate names, the following species of *Helix*, previously established by himself or others as quite distinct:—

1. *Helix similis* (Fér.)—Varr. *H. sculpturita* (Bens.), *peguensis* (Bens.), *zoraster* (Theobald), *pilidion* (Bens.) (*similis*, Fér.), *bolus* (Bens.), *cestus* (Bens.). The author observes that although this species has long been known as an example of a land-shell with a world-wide distribution, the degree of difference in form by no means coincides with the degree of local distance.

2. *Helix rotatoria* (Busch.)—Varr. *H. tapeina* (Bens.), *phayrei* (Theobald), *arakanensis* (Theobald), *akowtongensis* (Theobald), *huttoni* (Bens.), *oldhami* (Bens.).

3. *Helix fallaciosa* (Fér.)—Varr. *H. nagporensis* (Pfr.), *unicincta* (Bens.) = *propinqua* (Pfr.), *asperella* (Pfr.) (*fallaciosa* proper), *ruginosa* (Fér.), *crassicostata* (Bens.), *helferi* (Bens.).

4. *Helix climacterica* (Bens.)—Varr. *H. geiton* (Theob.), *pansa* (Bens.), *ornatissima* (Bens.), *anopleuris* (Bens.), *submissa* (Bens.).

5. *Helix infrendens* (Gould)—Varr. *H. capescens* (Bens.), *tickelli* (Theob.), *castra* (Bens.), *sanis* (Bens.).

6. *Helix tranquebarica* (Fabr.)—Varr. *H. semirugata* (Beck), *ligulata* (Fér.), *vitellina* (Pfr.), *bullata* (Hutt.).

7. Finally, the variability in shape of *H. vittata* is exemplified, and its affinity to *H. fallaciosa*, already maintained by Mr. Blanford, indicated.

BENSON, W. H. Characters of *Coilostele*, an undescribed genus of *Auriculacea*?, and of species of *Helix*, *Pupa*, and *Ancylus* from India, West Africa, and Ceylon. Ann. & Mag. Nat. Hist. 1864, xiii. pp. 136-140.

BENSON, W. H. Characters of new land-shells from the Mahabaleshwar Hills and from Agra in the North-west provinces of India. Ibid. pp. 209-211.

BENSON, W. H. Note on some shells of Southern India. Ibid. p. 496 (*Helix* and *Cyrena*).

MORELET, A. Descriptions de coquilles inédites. Journ. Conch. 1864, pp. 155-159.

6. *Indian Archipelago.*

MARTENS, E. VON. Diagnosen neuer Heliceen und Cyclostomaceen aus dem indischen Archipel. Monatsb. Akad. Wiss. Berl. 1864, February, pp. 116-121, April, pp. 264-270, July, pp. 523-529.

CROSSE, H. Description d'une espèce nouvelle. Journ. Conch. p. 321 (*Cyclophorus*).

SEMPER, O. Descriptions of new species of mollusks, of the genera *Rhegistoma* and *Pupina*. Proc. Zool. Soc. 1864, pp. 251, 252.

7. *New Caledonia.*

CROSSE, H. Etude critique sur les Bulimes auriculiformes de la Nouvelle Calédonie et des terres voisines. Journ. Conch. pp. 105-151.

These rather large species, the number of which has been increased so much of late years by the researches of French residents, inhabit the series of archipelagoes extending from the fifth to about the fortieth degree of southern latitude, viz. the Salomon Islands, New Hebrides, New Caledonia, Feejee Islands, and New Zealand. With regard to the occurrence of the same species in more than one of these groups, the author thinks (without doubt justly) that errors in the statements of their habitats, and probably also accidental introductions and acclimatizations may have occurred.

GASSIES, J. B. Addition à la faune conchyliologique de la Nouvelle Calédonie. Bordeaux, 1864, 4to, pp. 2, from Actes de la Société Linnéenne de Bordeaux, vol. xxv.

Contains the diagnosis of a new *Melania*.

8. *Australia.*

COX, J. C. Catalogue of the specimens of the Australian land-shells in the collection of James C. Cox. Sydney, 1864, 16mo.

A rather rich catalogue, enumerating 133 species of *Helix*, 17 *Bulimus*, 12 *Vitrina*, 8 *Succinea*, 6 *Pupa*, 1 *Vertigo*, 1 *Balea*, 1 *Diplommatina*, 1 *Truncatella*, 1 *Blanfordia*, 2 *Cyclostoma* (both of doubtful origin), 1 *Leptopoma*, 3 *Cyclophorus*, 7 *Pupina*, 2 *Pupinella*, 1 *Callia*, 1 *Hydrocena*, 5 *Helicina*. The new species are described. It is to be regretted that no attempt is made at a natural arrangement of the Australian *Helices*, the 133 species being enumerated in one continuous series. One of them is European and probably introduced, *H. nitida*, Müll. (*Hyalina* or *Zonitoides*). *Helix similaris* and *Leptopoma vitreum* may be mentioned as widely spread species.

The same author published descriptions of 5 other species in Proc. Zool. Soc. 1864, p. 594, and of 26 others in Ann. & Mag. Nat. Hist. xiv. 1864, pp. 180-185.

LEHMANN. Neue Nacktschnecke aus Australien. [A new slug from Australia.] Mal. Blätt. pp. 145-149.

MORELET, A. Descriptions de coquilles inédites. Journ. Conch. pp. 286-290.

9. *Pacific Islands.*

PEASE, W. H. Descriptions of new species of land-shells from the islands of the Central Pacific. Proc. Zool. Soc. 1864, pp. 668-676.

A rather large number of specimens supposed by the author to be new were sent to London, and compared with those in the Cumingian collection; those considered by Mr. Cuming as new are described by Dr. P. P. Carpenter; a list of the remainder, with the synonyms as determined by Messrs. Cuming and H. Adams, is given for persons who may have received them with Mr. Pease's manuscript names.

Localities are given in only a few cases; probably the greater part are from the Sandwich group (or Tahiti?).

PEASE, W. H. Remarks on the species of *Succinea* inhabiting the Tahitian Archipelago, with description of a new species. Proc. Zool. Soc. 1864, pp. 676, 677.

10. *Africa.*

DE CASTELLO DE PAIVA. Beschreibung einer neuen *Helix*. [Description of a new *Helix*.] Pfr. Mal. Blätt. p. 51. (*H. galeata* from Madeira).

PFEIFFER, L. Ueber die neueren Entdeckungen von Molluskenarten auf den Madeira-Inseln. [On the species of Mollusca recently discovered in the islands of Madeira.] Mal. Blät. pp. 52-56.

DOHRN, H. List of the shells collected by Captain Speke during his Second Journey through Central Africa. Proc. Zool. Soc. 1864, p. 116.

Twenty-seven species, one of which is recognized as new: two (*Limicolaria*) are known from the coast of Guinea; seven are South African types; four (*Limicolaria nilotica*, *Achatina spekei*, *Cyclostoma calcareum*, and *Ampullaria speciosa*) appear to belong to the equatorial parts of East Africa; one (*Navicella*) found at Johanna Island, Zanzibar, is a well-known species from Madagascar; the remainder are known from the Nile. It is much to be regretted that the exact localities of several of them could not be given, in consequence of which it remains doubtful whether some well-known species from the Nile are found only in tributaries of that river or also more southwards, and whether some South African species inhabit also the uppermost part of the Nile. *Lanistes boltenianus* (*Ampullaria carinata*, Olivier, sp.), *Paludina unicolor*, and *P. bulimoides*, the three most common and most characteristic freshwater Gasteropods of the Nile, are stated to inhabit the Lake Victoria N'yanza; *Etheria caillaudi* is said to be confined to the Upper Nile.

GRAY, J. E. On *Urocyclus*, a new genus of terrestrial gasteropodous Mollusca from Africa. Proc. Zool. Soc. 1864, p. 250, with a woodcut.

MORELET, A. Descriptions de coquilles inédites. Journ. Conch. pp. 155-159, 286-290.

BENSON, W. H. Descriptions of some new species of *Helix* and *Pupa* from the Colony of the Cape of Good Hope. Ann. & Mag. Nat. Hist. 1864, pp. xiii. 491-496.

11. Tropical America.

PFEIFFER, L. Zur Molluskenfauna von Cuba. Contributions to our knowledge of Cuban Mollusca. Mal. Blät. pp. 2-19, 102-114, 123-131, 157-161.

These reports on the latest collections made by Messrs. Wright, Arango, and Gundlach in Cuba contain not only descriptions of new species, especially of numerous *Macroceramus* and *Cylindrella*, but also new localities, and descriptions of the external soft parts of species previously known and belonging to the families *Helicidae*, *Cyclostomidae*, and *Helicinidae*.

GUPPY, R. J. LECHMERE. Descriptions of new species of fluviatile and terrestrial operculate Mollusca from Trinidad. Ann. & Mag. Nat. Hist. 1864, xiv. pp. 243-248.

MARTENS, E. VON. Ein neuer *Cyclotus*. Mal. Blätt. p. 113. (From Costa Rica.)

DUNKER, W. Ein neuer *Bulimus*. Mal. Blätt. p. 156. (From Peru.)

12. North America.

MORSE, E. S. Observations on the terrestrial Pulmonifera of Maine, including a catalogue of all the species of terrestrial and fluviatile Mollusca known to inhabit the State. Portland, 1864. 8vo, pp. 63.

We have not seen this work, but only a single sheet entitled "Synopsis of the fluviatile and terrestrial Mollusca of the State of Maine;" we have been informed that the work has since been published with the title given above. The paper is one of great interest on account of the systematic arrangement, which appears to have been founded on new observations of the teeth and jaws of the American species.

PFEIFFER, L. Zwei neue Landschnecken von Bermuda. Mal. Blätt. p. 1.

LEA, J. Observations on the genus *Unio*. Vol. x.

TRYON, G. W. Synopsis of the species of *Goniobasis* and *Schizostoma*. Proc. Acad. Nat. Sc. Philad. 1864, pp. 24 & 92.

b. Marine Mollusca.

1. Europe.

WALLER, E. On a new British species of *Rissoa*. Ann. & Mag. Nat. Hist. 1864, xiv. pp. 136-138.

TASLÉ. Catalogue des Mollusques observés dans le département du Morbihan. Vannes, 1864, 8vo, pp. 24; from Bull. Polymath. du Morbihan.

A list of 227 marine species, some of which are inadmissible as decidedly exotic; 8 species of *Mangelia*, 4 of *Scalaria*.

FISCHER, P. Diagnose d'une nouvelle espèce d'*Odostomia* des côtes de France. Journ. Conch. 1864, p. 70.

MACANDREW, R. Species of Mollusca obtained in Corunna Bay. Ann. & Mag. Nat. Hist. 1864, xiv. pp. 232-234.

A list of 152 species, of which 19 only are not British; those

which we should have expected least are *Cypræa candidula*, *Cassissaburon*, and *Solemya mediterranea*.

HELLER, C. Horæ Dalmatinæ. Bericht über eine Reise nach der Ostküste des adriatischen Meers. [Report on a voyage to the east coast of the Adriatic.] Verh. Zool.-Bot. Ges. Wien, 1864, xiv. p. 17.

This report contains a list of animals collected in the southern part of the Adriatic Sea, with 99 species of *Conchifera*, 2 of *Brachiopoda*, 137 of *Gasteropoda*, and 3 of *Cephalopoda*.

The fauna of littoral mollusca in the upper part of the Adriatic (at Venice and Trieste) is somewhat different from that of Naples and Sicily; therefore it is very interesting to see from this list how far the fauna of the southern part of the Adriatic approaches that of the Mediterranean.

WEINKAUFF, H. C. Additions au Catalogue des Coquilles marines recueillies sur les côtes de l'Algérie. Journ. Conch. pp. 7-11.

Twelve species are to be added to, and six to be erased from, a former catalogue by the same author (Journ. Conch. 1862); among the addenda there are some species not hitherto found on the European shores of the Mediterranean, although they have been known from the Atlantic coast of Africa, viz. *Murex gibbosus* (Lam.) and *Littorina punctata* (Gmel. sp.).

WEINKAUFF, H. C. Observations sur quelques espèces de la Méditerranée. Journ. Conch. pp. 11-16. (*Tritonium*, *Natica*, *Cancellaria*.)

CROSSE, H. Note sur les Psammobies des côtes de l'Algérie. Journ. Conch. pp. 16-19.

2. Japan and Northern China.

ADAMS, A. Notes on some molluscan animals from the seas of China and Japan. Ann. & Mag. Nat. Hist. 1864, xiii. pp. 140-144.—Observations on the soft external parts, and some remarks on the synonymy of the species.

ADAMS, A. On some new genera and species of mollusks from the seas of China and Japan. Ibid. pp. 307-310.

ADAMS, A. List of the species of *Fenella* found in the seas of Japan. Ibid. pp. 39-41.

ADAMS, A. On the species of *Neæra* found in the seas of Japan. Ibid. pp. 206-209.

3. Indian Seas.

ALDER, J., and HANCOCK, A. Notice of a Collection of Nudi-

branchiate Mollusca made in India by WALTER ELLIOT, Esq., with descriptions of several new species and genera. Trans. Linn. Soc. v. (1864) pp. 113-147, with six plates.

CROSSE, H., et FISCHER, P. Faune malacologique de Cochinchine. Premier supplément. Journ. Conch. pp. 322-338.

Additions to a list of shells of Cochinchina published in the preceding volume of the same periodical. Fifty-three species, most of them marine, are enumerated; several are new.

4. *Australia.*

SOVERBIE, S. M., et MONTROUZIER, R. T. Descriptions d'espèces nouvelles de l'Archipel Calédonien. Journ. Conch. pp. 41-42, 261-275.

A continuation of papers in preceding volumes of the same journal, containing submarine and marine shells. M. Montrouzier is missionary in New Caledonia.

JOUAN. Additions à la faune de la Nouvelle Calédonie. Mém. Soc. Sc. Nat. Cherbourg, 1864, x. pp. 301-311.

This paper contains some general observations on the molluscous animals of the Archipelago of New Caledonia. Species of *Trochus*, *Pterocera*, *Pecten*, *Spondylus*, *Tridacna*, *Pinna*, *Malleus*, and *Venus* are eaten in large quantities by the natives; oysters are common; also the pearl-oyster [*Meleagrina*] is not rare, but no pearls of any value are found.

CROSSE, H. Description d'espèces nouvelles provenant de l'Australie méridionale. Journ. Conch. pp. 339-346 (with figures).

CROSSE, H., et FISCHER, P. Diagnoses molluscorum Australiæ meridionalis. Journ. Conch. pp. 346-350.

CROSSE, H. Diagnoses d'espèces nouvelles de l'Australie méridionale. Journ. Conch. pp. 275-279.

ANGAS, G. Fr. Observations on the geographical distribution of the genus *Voluta*. Proc. Zool. Soc. 1864, pp. 50-54.

An enumeration of 35 species of *Voluta* and *Melo* inhabiting the seas of Australia, including those of New Caledonia, New Zealand, and the adjacent islands, which "may well be regarded as the metropolis of the Volutidæ."

SOWERBY, G. B. Diagnose d'une nouvelle espèce de *Volute* de l'Australie. Journ. Conch. p. 338.

ADAMS, H., and ANGAS, G. F. Descriptions of new genera and species of *Chitonidæ* from the Australian seas, in the collection of G. Fr. Angas. Proc. Zool. Soc. 1864, pp. 192-194.

- ANGAS, G. F. Description d'espèces nouvelles appartenant à plusieurs genres de Mollusques Nudibranches des environs de Port Jackson, accompagnée de dessins faits d'après nature. Journ. Conch. pp. 43-70, with 3 coloured plates.

This most valuable paper is a translation from the English original, with some additional notes by M. Crosse. Twenty-nine new species are described, one of which is the type of a new genus established and named by M. Crosse in honour of Mr. Angas. Four genera were previously known from Australia by the researches of Quoy and Gaimard.

5. California.

- CARPENTER, P. P. Diagnoses of new forms of Mollusca collected at Cape St. Lucas by Mr. Xantus. Ann. & Mag. Nat. Hist. 1864, xiii. pp. 311-315, 474-479; xiv. 1864, pp. 45-49.

- CARPENTER, P. P. Diagnoses of new forms of Mollusca from the Vancouver District. Ibid. xiv. pp. 423-429.

- CARPENTER, P. P. Descriptions of new marine shells from the coast of California. Proc. Calif. Acad. Nat. Sc. iii. pp. 155-159.

- BAIRD, W., and LORD, J. K. Remarks on a species of shell belonging to the family *Dentaliidae*, with notes on their use by the natives of Vancouver Island and British Columbia. Proc. Zool. Soc. 1864, pp. 136-138.

Dentalium pretiosum (Nuttall) lives buried in soft sand, at a depth of from 3 to 5 fathoms, always with the larger extremity directed upwards and close to the surface of the ground. This shell was formerly used by the natives as money, and *D. striolatum* (Stimpson) as ornament.

D. GENERA AND SPECIES.

The systematic arrangement of the following part of our Record is that of Messrs. H. and A. Adams, proposed in their 'Genera of Recent Mollusks,' except in the *Helicidae*, where we follow the system proposed by ourselves in the second edition of Albers's 'Heliceen.' The names used by authors are conscientiously retained, even in the cases where we hold a different opinion, limiting our suggestions to a few words within brackets [].

CEPHALOPODA.

Nautilus macromphalus (Owen). This species, which is rather rare in European Collections, is frequently found on the shores of New Caledonia,

thrown out by the sea; it has also been found several times alive, and the shell is said to form the object of a small trade. Jouan, Mém. Soc. Sc. Nat. Cherbourg, 1864, x. p. 301.

No other publication on CEPHALOPODA and PTEROPODA, within the year 1864, has come to our knowledge.

GASTEROPODA.

Order PECTINIBRANCHIATA.

Suborder PROBOSCIDIFERA.

MURICIDÆ.

Murex longicornis, Dunker, Pfr. Mal. Blätt. p. 99. Amboyna.

Trophon paiva, Crosse, Journ. Conch. p. 278, pl. 11. f. 7. York Peninsula, S. Australia.

Pisania elata, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 49. California.—*Pisania billeheusti*, Petit (Journ. Conch. v. and vi.), variety? *P. artensis*, Montrouzier, Journ. Conch. p. 266. Art-Island, New Caledonia.

Fusus (Pisania) demoulinsi, Montrouzier, Journ. Conch. p. 268, pl. 10. f. 3. Art-Island, New Caledonia.

PLEUROTOMIDÆ. See below under *Toxifera*.

TRITONIIDÆ.

Triton [Tritonium] waterhousei, Ad. et Ang., Proc. Zool. Soc. 1864, p. 35. Port Lincoln.—*T. [T.] strangei*, id. l. c. Moreton Bay.

Triton [Tritonium] succinctum (Lam.), notes on the synonymy by Wein-kauff, Journ. Conch. p. 11. The proper name for the Mediterranean species, *parthenopeus*, is erroneously rejected, as the author believed that it had been published in a "simple catalogue" by Dillwyn; but it is given by Salis, 'Reisen in verschiedene Provinzen des Königreichs Neapel'. Zürich und Leipzig, 1793, 8vo, where it is described, p. 370, and sufficiently well figured, pl. 7. f. 4.

BUCCINIDÆ.

Buccinum angasi, Crosse, Journ. Conch. p. 275, pl. 11. f. 5. South Australia.—*B. adelaidense*, id. l. c. p. 276, pl. 11. f. 6. Port Adelaide.—*B. filiceum*, Crosse et Fischer, Journ. Conch. p. 346. York Peninsula, S. Australia.

Eburna japonica; its soft parts described by A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 142.

Truncaria eurytoides, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 47. California.

Nassa tringa, Souverbie, Journ. Conch. p. 272, pl. 10. f. 7. New Caledonia.—*Nassa acuticosta*, Montrouzier, Journ. Conch. p. 273, pl. 10. f. 8. Art-Island, New Caledonia.—*Nassa munierriana*, Crosse, Journ. Conch. p. 345, pl. 13. f. 6. South Australia.

Neritula (Callomphala) lucida, Adams and Angas, Proc. Zool. Soc. 1864, p. 35. New South Wales.

Amycta undata, Carpenter, Proc. Calif. Acad. iii. p. 159. California.

Sistrum (? *ochrostoma*, var.) *rufonotatum*, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 48. California.

Latiaxis tectum-sinense (Desh. sp.). Some remarks by Weinkauff, Journ. Conch. p. 14.

Leptoconchus rostratus, A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 310. Japan.

OLIVIDÆ.

Ancillaria. Mr. Reeve figures the following species (nearly all without known habitat) in Conch. Ic. :—*A. contusa*, f. 31; *A. marmorata*, f. 32; *A. sarda*, f. 33; *A. monilifera*, f. 36, Swan River; *A. bullioides*, f. 37; *A. oryza*, f. 43; *A. fasciata*, f. 44.

VOLUTIDÆ.

Mr. Angas enumerates 35 species of *Voluta* and *Melo* as indigenous in Australia. Proc. Zool. Soc. 1864, p. 50.

Amoria. Some observations on this genus, with descriptions of some new varieties (of *A. turneri*), by J. E. Gray. Ann. & Mag. Nat. Hist. 1864, xiv. p. 236.

Voluta ellioti, Sowerby, Journ. Conch. 1864, p. 338, figured in the following volume (xiii. 1865), pl. 3. f. 19. From Australia.

MITRIDÆ.

Mitra timorensis, Dohrn in Pfr. Mal. Blatt. p. 56. Timor.—*Mitra michauxi*, Crosse et Fischer, Journ. Conch. p. 337 = *M. rigida*, Reeve, Conch. Icon. n. 169, not Swains. Pulo Condore.

Columbella regulus, Souverbie, Journ. Conch. p. 41 = *pumila*, Souverbie, Journ. Conch. 1863 (not Dunker). New Caledonia.—*Columbella saint-pairiana*, Cailliet, Journ. Conch. p. 279, pl. 11. f. 4. Island of Marie-galante, West Indies.—*Columbella articulata*, Souverbie, Journ. Conch. p. 271, pl. 10. f. 5. Art-Island.—*Columbella (Pisania?) sublaevis*, Montrouzier, Journ. Conch. p. 270, pl. 10. f. 4. Art-Island, New Caledonia.

Nitidella millepunctata and *N. denselineata*, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 48. California.

Anachis tinctoria and *A. fuscostrigata*, Carpenter, Ann. & Mag. Nat. Hist. xiv. pp. 48 & 49. California.

MARGINELLIDÆ.

Marginella. Mr. Reeve has figured the following species in Conch. ic. :—*M. newcombi*, f. 15, from the Agulhas Bank, South Africa; *M. vittata*, f. 17, and *M. quadrilineata*, f. 48, with the habitat unknown.

NATICIDÆ.

Natica millepunctata (Lam.); see on its synonymy Weinkauff, Journ. Conch. p. 14. The old specific names, *punctata* (Karsten), *stercus muscarum* (Gmel.), and *hebræa* (Martyn), which have each been reestablished in some

modern monographs, are rejected, because they refer either to the juvenile state or to a variety.

Sigaretus. Mr. Reeve has figured the following species in Conch. ic. :—*S. coarctatus*, f. 17, Singapore; *S. tumescens*, f. 18, hab. —?; *S. nitidus*, f. 20, Philippines; *S. oblongus*, f. 21, hab. —?; *S. eximius*, f. 22, Malacca; *S. pellucidus*, f. 23, Malacca; *S. pictus*, f. 24, South Australia; *S. argenteus*, f. 25, Australia; *S. fibula*, f. 26, hab. —?

SCALARIDÆ.

Scalaria delicatula and *Sc. consors*, Crosse et Fischer, Journ. Conch. p. 347. St. Vincent Bay, S. Australia.

Acirsa menesthoides, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 478. Cape St. Lucas, California.

Opalia exquisita, A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 310. Gotto Islands, Japan.—*Opalia crenatoides*, Carpenter, ibid. xiv. p. 47. California.

PYRAMIDELLIDÆ.

Obeliscus variegatus, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 46. California.

Chrysallida angusta, Carpenter, l. c. p. 47. California.

Odostomia moulinsiana, Fischer, Journ. Conch. p. 70. "Bassin d'Arcachon" (near Bordeaux?).

Odostomia (Evalea) aquisulpta and *O. delicatula*, Carpenter, Ann. & Mag. Nat. Hist. xiv. pp. 46 & 47. California.

EULIMIDÆ.

Eulima fuscostrigata, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 47. California.

STYLIFERIDÆ.

FISCHER, P. Monographie des genres *Stylifer* et *Entoconcha*. Journ. Conchyl. pp. 91–105.

The author gives the history of these genera and diagnoses of the 16 species known, which are distributed into three groups:—

- a. Spire short, last whorl very globose: *St. astericola* (Brod.), *turtoni* (Brod.), *ovoideus* (H. et A. Adams), *orbignyanus* (Hupe).
- b. Spire moderately short, shell thick: *St. mitrei* (Petit), *eburneus* (Desh.), *apiculatus* (Souverbie), *robustus* (Pease), *fulvescens* (A. Adams).
- c. Spire elongated, shell slender, form of *Eulima*: *St. corallinus* (Chemn.), *subulatus* (Brod.), *acicula* (Gould), *barronii* (A. Adams), *exaratus* (A. Adams), *subangulatus* (A. Adams), *paulucciæ* (Fischer), sp. n., p. 102, pl. 7. f. 3. Red Sea.

Some doubtful species are added. The genus extends throughout the Indian and Tropical Pacific Oceans, from the Red Sea to the Galapagos Islands. Three species are indicated as indigenous in the West Indies, and acknowledged to be of doubtful origin. All the species appear to dwell on Echinodermata, Asteridæ or Echinidæ.

JEFFREYS, J. G. Remarks on *Stilifer*, a genus of quasiparasitic mollusks, with particulars of the European species. Ann. & Mag. Nat. Hist. xiv. pp. 321-334.

Two specimens of *Stilifer turtoni* have been observed alive; they always occupied the upper surface of an Echinus, near the vent, whilst *Montacuta substriata* inhabits the under surface near the mouth; they are not fixed, but creep about and seem to pass their whole life on the Echinus; there is no predilection for a particular species of Echinus. A description of the animal and shell in its adult and young state is given.—The author knows 16 species.

Cythnia asteriophila, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 478. From Cape St. Lucas, California.

Entoconcha. Although there is no other affinity between this curious animal and *Stylifer* than the similarity of parasitic life, we follow the arrangement of Messrs. Adams, and insert here an abstract of a memoir by A. BAUR, "Beiträge zur Naturgeschichte der *Synapta digitata*—Dritte Abhandlung: Die Eingeweide-Schnecke (*Helicosyrinx parasita*) in der Leibeshöhle der *Synapta digitata*." Nov. Act. Ac. Cæs. Leop. Carol. Nat. Cur. xxxi. 1864. By the organization of the adult and by its parasitic life in the interior of another animal, this mollusk is distinguished not only from *Stylifer*, but from any other known family of Gastropoda.

The author devoted two months, at Zaule near Trieste, to observing and investigating this animal, which, years ago, had been the wonder of Joh. Müller; but in consequence of its rarity (it does not occur more than once in 100 individuals of *Synapta*), he has not had the good fortune to discover new facts with regard to its development. However, he came to the conclusion that the seeming insertion of the "shell-bearing bag" in the cephalic part of the *Synapta*, where also the genital organs are situated (as observed by Müller), is only the result of the violent contractions of the *Synapta* during capture, and that, therefore, the idea of a genetic relation between *Synapta* and the "shell-bearing bag" must be abandoned. He thinks that the bag is to be regarded as a distinct, entire individual, belonging to the *Nudibranchiata*, and reduced by retrogressive metamorphosis to a kind of bag containing, besides the well-developed male and female organs of generation, a blind intestine only. He creates for it the name of *Helicosyrinx parasita*, as, in his opinion, that of *Entoconcha* cannot be applied to an animal which, in an adult state, is without shell. The young ones are provided with a shell, like those of all other *Nudibranchiata*, and pass the first period of their existence in the abdominal cavity of *Synapta*; in consequence of the rupture which so frequently takes place in *Synapta*, they become free, and are thus enabled to immigrate

after some time into other Synaptae. How far they are developed before this immigration takes place, and how they enter the Synapta, is not yet known. Probably only very young Synaptae are invaded by this parasite, the size of the latter being always proportioned to that of the former, and the parasite being fixed, in every case, to that part of the intestine which is first developed in the young Synapta.

Suborder TOXIFERA.

CONIDÆ.

M. Boivin describes and figures the following species of *Conus* in Journ. Conch. 1864:—*C. consul*, p. 33, pl. 1. figs. 5, 6; *C. dalhne*, p. 35, pl. 1. figs. 7, 8, "Indian Ocean;" *C. licor*, p. 36, pl. 1. figs. 1, 2; *C. dolium*, p. 38, pl. 1. figs. 3, 4; *C. miser*, p. 39, pl. 1. fig. 9, Cape Verde.

PLEUROTOMIDÆ.

Pleurotoma apiculata, Montrouzier, Journ. Conch. p. 264. pl. 10. f. 2. Art Island, New Caledonia.

Pleurotoma undatiruga (Bivona) has been found in a recent state, at Algiers, where it is not very rare, by M. Weinkauff. Journ. Conch. p. 15.

Drillia appressa, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 46. California.

Eithara fusconotata, Carpenter, ibid. California.

Mangelia subdiaphana, Carpenter, ibid. p. 45. California.

Suborder ROSTRIFERA.

CYPRÆIDÆ.

Cypræa candidula (Gaskoin) in Corunna Bay, hitherto not known as European. M'Andrew, Ann. & Mag. Nat. Hist. xiv. p. 232.

CANCELLARIIDÆ.

Cancellaria cancellata (L. sp.). The living animal, found on sandy ground in a depth of only 25–30 feet, is described by Weinkauff, Journ. Conch. p. 13.

Cancellaria spengleriana. Soft parts described; no operculum. A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 143.

CERITHIIDÆ.

Cerithium monachus, Crosse et Fischer, Journ. Conch. p. 347. Port Adelaide.

Bittium nitens, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 478. Cape St. Lucas, California.

MELANIIDÆ.

Melania psorica, Morelet, Journ. Conch. p. 287, Madagascar; and *M. soriculata*, Morelet, ibid., Great Bassam, W. Africa; *Melania plumbea*, Brot, Journ. Conch. p. 19, pl. 2. f. 1, New Guinea?; *Melania montrouzieri*, Gassies, Actes Soc. Linn. Bordeaux, xxi. 1864, New Caledonia; this species had been figured, without description, in the same author's previous work on the Mollusks of New Caledonia.

Goniobasis. Mr. G. W. Tryon gives a synopsis of the species of the genus 1864. [VOL. I.]

Goniobasis (*Ceriphasia*, Adams). Proc. Acad. Nat. Sc. Philad. 1864, p. 24. All the species are American; the synonymy is carefully given.

Melama (*Hemisinus*) *wesseli*, Brot, Journ. Conch. p. 20, pl. 2. f. 2; locality doubtful.

Schizostoma. Mr. G. W. Tryon gives a synopsis of the species of the genus *Schizostoma* (Lea) = *Melatoma* (Anthony) = *Gyrotoma* (Shuttl.). Proc. Acad. Nat. Sc. Philad. 1864, p. 92.

Melanopsis maroccana, Chemnitz, sp. (*dufourii*, Fér.), Bourg. Mal. Alg. v. pl. 15. f. 12-26, pl. 16. f. 1-14, including several varieties. Enlarged figures of the living animal (f. 15, 16) are given; it resembles much that of *Melania*.

Melanopsis maresi, Bourg. l. c. pl. 16. f. 21-24. This species, hitherto known in a fossil state only, has been found alive in the country south of Tunis by M. Duveyrier. Bourg. Mollusques de la Sahara.—*Melanopsis tingitana*, Morelet, Journ. Conch. p. 155. Marokko.

LITORINIDÆ.

Litorina pullata, Carpenter, Ann. & Mag. Nat. Hist. xiii. 1864, p. 477. Cape St. Lucas, California.

Risella. M. Crosse has published a monograph of this genus, Journ. Conch. pp. 225-243, enumerating nine species (two of which were not known to Philippi when he published his monograph in the Malakozoologische Zeitschrift, 1846). The author figures three species: *R. melanostoma* (Gmel. sp.), pl. 11. f. 1; *plana* (Q. G. sp.), f. 2; *bruni* (sp. n., Crosse), from Spencer Bay, S. Australia, f. 3, p. 241. All the species are from Australia.

Lacuna porrecta, L. (? *solidula*, var.) *compacta*, and *L. variegata*, Carpenter. Ann. & Mag. Nat. Hist. xiv. p. 428. Vancouver district.

Fossarus. M. Récluz has published "Observations sur le genre *Fossarus* (*Fossarus*)," Journ. Conch. pp. 247-251. An examination of the soft parts of the animal leads to the distinction of two sections within this genus, the one including the typical species, *F. adansonii* (Phil.), with the margin of the mantle entire and with a distinct velum in front of the tentacles; the other, *Clathrella*, with the margin of the mantle crenulated and without velum, including *F. costatus* (Brocchi, sp.) and *F. minutus* (Mich.).

Hr. Fischer adds a "Note sur le genre *Fossarus*, suivie du catalogue des espèces," *ibid.* pp. 252-260. He gives a short history of the genus, and proposes to retain it in the family of Litorinidæ, associating with it a new genus, *Ariadna*, for *Trichotropis borealis*, and enumerates 41 species, five of which are European, two being found in the Mediterranean, two in West Africa (one of them identical with a Mediterranean species), two in the West Indies, eight on the Pacific shores of America (Panama and Mazatlan), seven in the tropical Indo-Pacific Ocean from the Red Sea to the Sandwich Islands and New Caledonia, and no less than nineteen in the Japanese Islands, which are due to the researches of Mr. A. Adams.

Fossar parcipectus and *F. purus*, Carpenter, Ann. & Mag. Nat. Hist. xiii. pp. 476, 477. Cape St. Lucas, California.

Isapis fenestrata, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 429. Vancouver district.

RISSEOELLIDÆ.

Hyala rotundata, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 478. Cape St. Lucas, California.

Diala electrina, Carpenter, *l. c.*; Cape St. Lucas, California.

RISSOIDÆ.

Fenella. Mr. A. Adams has published a paper "on the animal and affinities of *Fenella*, with a list of the species found in the seas of Japan." Ann. & Mag. Nat. Hist. xiii. pp. 39-41. It is a genus of *Rissoidea*, with the shell turreted as in *Bittium* and *Cerithium*, but not emarginate in front. Most of the species have been described by the author in the same journal (1860) under the generic name of *Dunkeria*.

Fenella crystallina, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 477. Cape St. Lucas, California.

Rissoa. "Ueber die Familie der Rissoiden. II. *Rissoa*." By G. Schwartz von Mohrenstern. Denkschr. Acad. Wiss. Wien, xxiii. 1864, pp. 58, with 4 plates.

The author gives the history and fixes the principal characters of this genus, paying attention to the soft parts as well as to the operculum; then he proceeds to examine the affinities between the recent and fossil species, representing them by two schematic illustrations, in one of which it is shown that three types only of the tertiary period have branched off into the 30 recent species. However, the chief contents of this memoir are very exact descriptions of 47 species which are beautifully illustrated. The genus is retained with the same limits which have been assigned to it by Adams and others, the cancellated species (*Alvania*, Risso) being excluded and reserved for a future monograph, like the present one, and like that on *Rissoina* published by the same author some years ago. The recent species are chiefly European: out of thirty-four, 27 (26) are Mediterranean; no tropical or Australian species is known at present, the most southern locality in which they have been found being the Canary Islands.—This monograph is of great importance, and will be the standard work for subsequent researches.

Rissoa obscura (Phil.) = *parva*, var. (Schwartz v. Mohrenst.). It so happens that the Recorder is able to point out one little mistake which occurs in the memoir just mentioned, with regard to this species, which is stated to inhabit the Mediterranean and Sicily (p. 25). Although Philippi named, described, and figured it in his well-known work on the Mollusks of that island, he was unacquainted with its habitat, placing it in a foot-note, as he did the other exotic species recognized by him as new. Now the specimens described by Philippi were detected some years ago by Hr. Georg von Martens and Mr. Benz among the Algæ collected at Biaritz in the Bay of Biscay by the late botanist Endress. The species proved to be very common there, and the Recorder also found it afterwards on the coast of Norway; but among a

great number of Rissoæ collected at different localities of the Mediterranean, not a single specimen has occurred; so that we are much inclined to think that it does not inhabit that sea, although Schwartz mentions Corsica also as one of its habitats.

Rissoa subcostulata. This name is substituted by Schwartz von Mohrenstern for the British *R. costulata* (Alder) which is different from *R. costulata* (Risso).

Rissoa jeffreysi, Waller, Ann. & Mag. Nat. Hist. xiv. p. 136. Unst, Shetland. Near *R. cinicoides* (Forbes).

Rissoa albolineata, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 477. Cape St. Lucas, California.

Alvania reticulata and *A. filosa*, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 429. Vancouver district.

Hydrobia. M. Bourguignat (Malac. Algér. v.) describes and figures the following species from Algeria: *H. peraudieri*, *H. acerosa*, *H. brandeli* (= *H. acuta* of previous authors), *H. arenaria*, *H. sordida* (Küst. sp.).

Hydrobia duveyrieri, Bourguignat, Moll. terr. et fluv. de la Sahara.—*Hydrobia compacta*, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 478, an *H. barbeia*? From Cape St. Lucas, California.

Moitesseria. Dr. E. von Martens reported on this genus in Mal. Blatt. p. 162; it was established by M. Bourguignat in the preceding year for the so-called *Paludina* or *Acicula simoniana*; its systematic position cannot be determined at present with certainty, as neither the operculum, nor the soft parts, nor the radula are known. With regard to the shell, it closely approaches *Hydrobia*, from which it is distinguished by a notch in the outer lip of the aperture, similar to that in *Pleurotoma*.

PALUDINIDÆ.

Paludina. "Verzeichniss der Namen der fossilen und lebenden Arten der Gattung *Paludina* (Lam.), nebst jenen der nächststehenden, und Einreihung derselben in die verschiedenen neueren Gattungen," von G. v. FRAUENFELD. [List of the names of the fossil and living species of *Paludina* (Lam.) and of the genera allied to it, and their distribution among the various more modern genera.] Verhandl. Zool. Bot. Ges. Wien, xiv. pp. 361–672.

An alphabetical list of all the names of species belonging to the old genus *Paludina*, with the modern synonymy and numerous critical remarks. We beg to make a few additions to the latter:—

p. 571. *angularis* (Müll.), described in the "Historia Vermium" and figured by Chemnitz, is the Chinese *Pal. quadrata* (Bens.), and not the species of the Eastern Archipelago (as believed by Philippi and others), which is much nearer to *costata* (Q. & G.).—*P. carinata* (Val.) is very probably not from Mexico, but from the Philippines, just as *Nanina ovum* and *N. strophophora* were erroneously indicated by the same author as Mexican species.

p. 617. *ingallsiana* (Lea). This is the most common species in Siam; the locality "Japan," attached to specimens in Mr. Cuming's collection, seems to us very doubtful.

p. 622. *littorea* (Phil.). The figure of the animal given by Philippi in Wiegmann's Archiv and reproduced by Gray, Fig. of Moll. An. ii. pl. 125. f. 6, is not that of an animal belonging to the genus *Assiminea*.

p. 654. *thermalis* (L.). The locality given by Linné is not Abano (in Venetia), but Pisa in Tuscany; and his description cannot be applied to the well-known species of Abano, which is considered to be *thermalis* (L.) by most authors and even by Hr. v. Frauenfeld himself. Also Mr. Hanley appears to have had a different species, nearer to the true *Bithynia*. Therefore we think the species of Abano may retain the name *aponensis*, which we gave to it nine years ago, and which we have never cancelled (p. 578).

p. 660. *vivipara* (L.) and *vera* (Frauenfeld), p. 658. *Helix vivipara* (L.) includes, without doubt, the two species distinguished afterwards by O. Fr. Müller as *vivipara* and *fasciata*. Therefore we think these names should be retained. But if the name of *vivipara* should be rejected for the larger and more common species, it must be called *listeri* (Forbes), this name as well as that of *contecta* (Millet) having the priority before "*vera*, Frauenfeld."

p. 661. *vulgaris* (*Paludinella*), Oersted, is described in Oersted, "De regionibus marinis," Diss. Havniæ, 1844, 8vo, p. 69.

Vivipara eximia, Frauenfeld, Verh. Zool. Bot. Ges. Wien, xiv. 1864, p. 150. pl. 5. f. 2; Northern China. [Near *Paludina quadrata*, Bens.]

Bithynia numidica, Bourguignat, Malac. Algér. v. p. 225, c. fig. (= *B. ventricosa*, Morelet, Catal. Moll. Algér.). Near Calle and Bone.

Bithynia spiralis, Guppy, Ann. & Mag. Nat. Hist. 1864, xiv. p. 244, from Trinidad. [Is to be compared with *Paludina coronata* (Pfr.) from Cuba; there is also a very similar shell in the Lake of Valencia, Venezuela.]

Paludomus cyanostomus, Morelet, Journ. Conch. p. 288, from Siam.

VALVATIDÆ.

Valvata. Magnified figures of *V. alpestris* (Blauner), *piscinalis* (Müll.), *obtusa* (Brard), and *contorta* (Müll.) are given by Bourguignat, Malacologie d'Aix-les-Bains, pl. 1. f. 6-25. [The differences between them consist chiefly in the elevation of the spire and the corresponding narrowness of the umbilicus—characters which are known to vary considerably in every dozen of specimens found together on the shores of the larger lakes of Germany, and which, therefore, are of but little value for specific distinction.]

Valvata agglutinans, Guppy, Ann. & Mag. Nat. Hist. xiv. p. 245; from Trinidad.

AMPULLARIIDÆ.

Ampullaria palustris, Morelet, Journ. Conch. p. 158. Lake Ebrie, near Senegal.

Ampullaria purpurascens, Guppy, Ann. & Mag. Nat. Hist. xiv. p. 243, from Trinidad; allied to *A. chemnitzii*, and belonging to the genus *Pomus* (Adams).

Eggs of *Ampullaria* (*Marisa*) *effusa* are described by the same author, ibid. p. 244.

TURRITELLIDÆ.

Turritella spina, Crosse et Fischer, Journ. Conch. p. 347. S. Australia.

VERMETIDÆ.

Bivonia compacta, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 427. Vancouver district.

Serpulus adamsi (Mörch) = *Serpulorbis imbricatus* (Dunker) from Manchuria and Japan; soft parts described. A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 141.

CAPULIDÆ.

Hipponyx cranioides, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 427. Vancouver district.

VANIKORIDÆ.

Narica aperta, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 476. Cape St. Lucas, California.

Order SCUTIBRANCHIATA.

Suborder PODOPTHALMA.

NERITIDÆ.

Neritina. M. Bourguignat figures the following species in Malac. Algér. v. pl. 16: *N. numidica* (Recluz), figs. 25-28; *N. maresi* (Bourg.), figs. 29-33; and *N. fluviatilis* (L. sp.), figs. 34-41.

Neritina cristata, Morelet, Journ. Conch. 1864, p. 288, from the Gaboon.

Neritella (*Dostia*) *lifuensis*, Adams and Angas, Proc. Zool. Soc. 1864, p. 36, from Viti-Lifu, Feejee Islands.

[*Navicella*] *Catillus ornatus*, Adams and Angas, ibid., from Viti-Lifu.

TROCHIDÆ.

Phasianella angasi, Crosse, Journ. Conch. p. 344, pl. 13. f. 5. Port Elliot, S. Australia.

Eucosmia (new subgenus of *Phasianella*), Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 475, with the species *Eu. substriata*, p. 475, *Eu. punctata*, p. 475, and *Eu. cyclostoma*, p. 476; all from Cape St. Lucas, California.

Turbo naninus, Souverbie, Journ. Conch. p. 263, pl. 10. fig. 6, from Art Island, New Caledonia.

Liotia angasi, Crosse, Journ. Conch. p. 343, pl. 13. fig. 4, from South Australia.—*Liotia fenestrata*, Carpenter, Proc. Calif. Acad. Nat. Sc. iii. p. 158, and *L. acuticostata*, Carpenter, l. c. p. 159, both from California.

Haplocochlias, g. n., Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 476, near *Ethalia* [*Rotella*], "*Calloniam simulans*." Animal and operculum unknown. The typical species is *H. cyclophorus*, from Cape St. Lucas, California.

Trochus. M. Crosse describes the following South Australian species, Journ. Conch. 1864: *T. blandianus*, p. 339, pl. 13. f. 1; *T. abnormis*, p. 341, pl. 13. f. 2; *T. ramburi*, p. 342, pl. 13. f. 3.

Thalotia mundula, Adams and Angas, Proc. Zool. Soc. 1864, p. 37, from Sharks Bay, W. Australia.

Turciea (Trochus) instructa (Gould). Its soft parts are described by Mr. A. Adams, Ann. & Mag. Nat. Hist. 1864, xiii. p. 143.

Calliostoma formosum and *C. splendens*, Carpenter, Proc. Calif. Acad. Nat. Sc. iii. p. 156, from California.

Cantharidus decoratus, Adams and Angas, Proc. Zool. Soc. 1864, p. 37. York Peninsula, S. Australia.

Trochocochlea excavata, Adams and Angas, *ibid.* New Zealand.

Photinula quæsitæ (A. Adams), from Japan. Soft parts described. A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 140.

Omphalius pfefferi, Dohrn, Mal. Blätt. p. 56. New Hebrides.

Gibbula nitida, Adams and Angas, Proc. Zool. Soc. p. 36. Hokianga, New Zealand.—*G. picturata*, Adams and Angas, *ibid.*, from Port Jackson.

Gibbula parvipicta, *G. succincta*, *G. lacunata*, and *G. funiculata* are species from the Vancouver district, described by Carpenter, Ann. & Mag. Nat. Hist. 1864, xiv. pp. 426, 427.

Margarita acuticostata, Carpenter, Proc. Cal. Acad. Nat. Sc. iii. p. 157. from Santa Barbara, California.—*M. salmonea*, Carpenter, *l. c.* p. 158, from Monterey.—*M. cidaris*, A. Adams, Ann. & Mag. Nat. Hist. 1864, xiv. p. 426, from the Vancouver district.

Solariella peramabilis, Carpenter, Proc. Cal. Acad. Nat. Sc. iii. p. 156, from Catalina Island, California. *Solariella* is here used as a subgenus for species of *Margarita* with a large, crenated umbilicus, = *Minolia* of A. Adams.

Suborder EDRIOPHTHALMA.

FISSURELLIDÆ.

Fissurella. Messrs. Crosse and Fischer describe two South Australian species in Journ. Conch. p. 348: *F. omicron* from Spencer Bay, and *F. concatenata* from Port Lincoln.

Glyphis quadriradiata (Sow. sp.). Mr. A. Adams describes the soft parts, Ann. & Mag. Nat. Hist. 1864, xiii. p. 144.

Glyphis saturnalis, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 475, from Cape St. Lucas, California.

Emarginula thomasi, Crosse, Journ. Conch. 1864, pp. 43 & 152, pl. 7. fig. 1, from Aden.

TECTURIDÆ.

Acmaea. Mr. Carpenter has described two species, *A. atrata* and *A. strigatella*, from Cape St. Lucas, California. Ann. & Mag. Nat. Hist. 1864, xiii. p. 474.

Pilidium commodum (Middendorff) = *Capulus depressus* (A. Adams, Ann. & Mag. Nat. Hist. 1860), from Saghalien. A. Adams, *ibid.* 1864, xiii. p. 142.

PATELLIDÆ.

Patella calamus, Crosse and Fischer, Journ. Conch. 1864, p. 348, from South Australia.

Nacella peltoides, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 474, from Cape St. Lucas, California.

CHITONIDÆ.

Ischnochiton. Mr. Carpenter has described three species from Cape St. Lucas, California, in Ann. & Mag. Nat. Hist. 1864, xiii.: *I. parallelus*, p. 314; *I. prasinatus*, p. 314; and *I. serratus*, p. 315.

Lepidopleurus. Messrs. Adams and Angas have described three Australian species in Proc. Zool. Soc. 1864, p. 192: *L. variegatus*, from York Peninsula; *L. speciosus*, from Port Lincoln; and *L. liratus*, from York Peninsula.

Stenochiton (n. g.), Adams and Angas, *l. c.* p. 193, with the species *St. juvuloides*, from Holdfast Bay, S. Australia.

Chatopleura conspersa, Adams and Angas, *ibid.*, from Port Lincoln.

Lorica angasi, Adams, *ibid.*, from Rapid Bay, S. Australia.

Microplax, n. g., Adams and Angas; *l. c.* p. 194, with the species *M. grayi*, from Sydney Harbour.

Hanleya variabilis, Adams and Angas, *ibid.*, from York Peninsula.

Acanthochites carinatus and *A. costatus*, Adams and Angas, *ibid.*, from Sydney.

Mopalia (*kennerleyi*, var.) *swannii*, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 426, from the Vancouver District.

Order TECTIBRANCHIATA.

TORNATELLIDÆ.

Dr. v. Martens makes some remarks on *Buccinulus*, Adams, in Mal. Blätt. p. 165; he shows that Mr. Adams has erroneously rejected the name *Solidula* for a genus (or rather subgenus) of *Tornatellidæ*, and substituted for it that of *Buccinulus*, as Plancus described under this name a species which does not belong to this genus, being the well-known *Tornatella tornatilis* of the Mediterranean.

BULLIDÆ.

Alys casta, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 314. Cape St. Lucas, California.

Smaraudinella sieboldi, A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 310. Japan.

LOPHOCERCIDÆ.

Cylindrobulla fischeri, Adams and Angas, Proc. Zool. Soc. 1864, p. 37. South Australia.

Order NUDIBRANCHIATA.

Suborder ANTHOBRANCHIATA.

DORIDIDÆ.

Mr. Angas has described and figured the following South Australian species of *Actinodoris* and *Doris* in Journ. Conch. 1864:—

- | | |
|---|--|
| <i>A. australis</i> , p. 49, pl. 4. f. 8. | <i>D. arbutus</i> , p. 47, pl. 4. f. 4. |
| <i>D. variabilis</i> , p. 44, pl. 4. f. 1. | <i>D. pantherina</i> , p. 47, pl. 4. f. 5. |
| <i>D. denisoni</i> , p. 45, pl. 4. f. 2. | <i>D. nodulosa</i> , p. 48, pl. 4. f. 6. |
| <i>D. chrysoderma</i> , p. 46, pl. 4. f. 3. | <i>D. carneola</i> , p. 48, pl. 4. f. 7. |

Messrs. Alder and Hancock have described and figured the following species, most of which were discovered by Mr. W. Elliot at Waltair (Madras Presidency); Trans. Zool. Soc. v. 1864:—

- | | |
|---|--|
| <i>D. formosa</i> , p. 116, pl. 29. fs. 1-3. | <i>D. tristis</i> , p. 121, pl. 28. fs. 6, 7. |
| <i>D. ellioti</i> , p. 116, pl. 28. fs. 1, 2. | <i>D. apiculata</i> , p. 122, pl. 30. f. 8. |
| <i>D. pardalis</i> , p. 117, pl. 28. f. 3. | <i>D. carinata</i> , p. 122, pl. 29. fs. 5, 6. |
| <i>D. concinna</i> , p. 118, pl. 28. fs. 4-6. | |
| <i>D. fragilis</i> , p. 118, pl. 28. fs. 7, 8. | <i>D. striata</i> (Kelaart), pl. 29. f. 4. |
| <i>D. areolata</i> , p. 119, pl. 30. fs. 1-3. | <i>D. castanea</i> (Kelaart), pl. 28. f. 9. |
| <i>D. villosa</i> , p. 119, pl. 33. f. 1. | <i>D. osseosa</i> (Kelaart), pl. 28. fs. 10, 11. |
| <i>D. rusticata</i> , p. 120, pl. 30. fs. 4, 5. | <i>D. funebris</i> (Kelaart), pl. 30. fs. 9, 10. |

Of these the last four are from Ceylon, and were described in Journ. As. Soc. Beng. and in Ann. & Mag. Nat. Hist. 1858. The species named *Doris carinata* is not identical with that described by Quoy and Gaimard under the same name (*Atagema carinata*, Gray).

Chromodoris, Alder and Hancock, Trans. Zool. Soc. v. p. 122, differs from *Doris* by having the foot exposed, and linear, simply pinnate, retractile branchiæ. Evidently approaching *Goniodoris*. *Ch. zebrina*, Alder and Hancock, l. c. p. 123, pl. 29. f. 7, from Waltair.

Angasiella, Crosse, with tentacles of the true *Doris*, elongated form of *Goniodoris*, and three branchiæ only as in *Triopa*. *A. edwardsi* (Angas), Journ. Conch. p. 49, pl. 4. f. 9; from Port Jackson.

Goniodoris. Mr. Angas describes the following species in Journ. Conch.: *G. atromarginata* (Cuv.), p. 51; *G. bennetti* (Angas), p. 51, pl. 4. f. 10, from Port Jackson; *G. lorinqi* (Angas), p. 52, pl. 4. f. 11, from Port Jackson; *G. festiva* (Angas), p. 53, pl. 4. f. 12, from Vacluse Bay, South Australia; *G. daphne* (Angas), p. 54, pl. 5. f. 3, from Woolloomooloo Bay, South Australia; *G. crossei* (Angas), p. 54, pl. 5. f. 1, from Port Jackson; *G. splendida* (Angas), p. 55, pl. 5. f. 2, from Port Jackson; *G. verrucosa* (Crosse), p. 56, pl. 5. f. 4, from Port Jackson; *G. erinaceus* (Crosse), p. 57, pl. 5. f. 5, from Port Jackson.

Messrs. Alder and Hancock describe three species from Waltair, in Trans. Zool. Soc. v. p. 131: *Goniodoris aspersa*, pl. 33. f. 2; *G. citrina*, pl. 32. f. 1-3; *G. modesta*, pl. 28. f. 12.

Doridopsis, Alder and Hancock. A new genus, being the type of a distinct family, and characterized thus (Trans. Zool. Soc. v. p. 124):—Cloak large, without *spicula* or marginal appendages. Dorsal tentacles retractile, within cavities; no oral tentacles. Mouth suctorial, opening on the front margin of the foot; without tongue, jaws, or collar; with a retractile proboscis. The absence of a tongue, and the attenuated suctorial tube instead of powerful muscular buccal organs, form the chief peculiarity of this genus. The following new species from Waltair belong to it:—

Doridopsis fusca, p. 126, pl. 31. f. 3; *D. gemmacea*, p. 126, pl. 31. fs. 4-7; *D. clavulata*, p. 127, pl. 31. fs. 10-12; *D. pustulosa*, p. 128, pl. 31. fs. 8, 9;

D. atromaculata, p. 129, pl. 31. fs. 20-24; *D. punctata*, p. 129, pl. 31. f. 17; *D. miniata*, p. 130, pl. 31. fs. 18, 19.

Also the following species, previously described as *Doris*, belong to this genus, and are figured in the same paper :—

D. tuberculosa (Quoy and Gaimard), pl. 29. fs. 8-10; *D. carbunculum* (Kelaart), from Coromandel, is perhaps the same; *D. rubra* (Kelaart), pl. 31. fs. 1, 2, from Ceylon; *D. nigra* (Stimpson), pl. 31. fs. 13-16 = *Doris atrata* and *D. atroviridis* (Kelaart).

Polycera cooki, Angas, Journ. Conch. p. 58, pl. 5. f. 6, from Botany Bay.

Trevelyana bicolor, Alder and Hancock, Trans. Zool. Soc. v. p. 132, pl. 29. fs. 11, 12, from Waltair.

Plocamophorus ceylonicus (Kelaart), figured Trans. Zool. Soc. v. pl. 32. fs. 4-6. — *Plocamophorus imperialis*, Angas, Journ. Conch. p. 59, pl. 5. f. 7, from Vaucluse Bay, South Australia.

ONCHIDORIDÆ.

Kalinga, g. n., Alder and Hancock, intermediate between *Euplocamus* and *Plocamophorus*, with the branchial plumes separate as in *Hexabranchus*; *K. ornata*, Alder and Hancock, Trans. Zool. Soc. v. p. 135, pl. 32. fs. 7-10, from Waltair.

TRIOPIDÆ.

Triopa yatesi, Angas, Journ. Conch. p. 60, pl. 5. f. 8, from Watson Bay, South Australia.

Suborder ÆOLOBRANCHIATA.

TRITONIIDÆ.

Melibæa australis, Angas, Journ. Conch. p. 62, pl. 6. f. 2, from Watson Bay, South Australia.

Melibe fimbriata, Alder and Hancock, Trans. Zool. Soc. v. p. 138, pl. 33. fs. 6, 7, from Waltair. This genus is stated to be closely allied to *Tethys*; the digestive and reproductive organs have been examined. [It appears to us to be identical with *Chioræa leonina* (Gould), Adams, Gen. of Recent Moll. ii. p. 71, pl. 138. f. 1.]

Scyllæa marmorata, Alder and Hancock, l. c. p. 136, pl. 33. f. 3; and *Sc. viridis*, Alder and Hancock, ibid. fs. 4, 5; both from Waltair.

Bornella digitata (Adams), from Waltair, reexamined and figured by Messrs. Alder and Hancock, Trans. Zool. Soc. v. p. 139, pl. 33. fs. 8, 9. — *Bornella hermanni*, Angas, Journ. Conch. p. 61, pl. 6. f. 1, from Watson Bay, South Australia.

PROCTONOTIDÆ.

Janus sanguineus, Angas, Journ. Conch. p. 63, pl. 6. f. 5, from Watson Bay, South Australia.

Madrella, g. n., Alder and Hancock, differs from the other members of this group in the lateral position of the anus, and the absence of oral tentacles, unless the oral veil be considered such. *M. ferruginosa*, Alder and Hancock, Trans. Zool. Soc. v. p. 142, pl. 33. fs. 10-12, from Waltair.

ÆOLIDÆ.

Glaucus forsteri (Lam.), figured by Alder and Hancock, Trans. Zool. Soc. v. pl. 33. f. 13.

Æolis. Messrs. Alder and Hancock, *l. c.*, describe and figure the following species from Waltair: *Eolis unilineata*, p. 143, pl. 33. f. 14; *E. militaris*, p. 144, pl. 33. f. 15; and *E. ocellata*, p. 144, pl. 33. fs. 16, 17.

Mr. Angas describes two species from Port Jackson: *Æolis foulisi*, Journ. Conch. p. 64, pl. 6. f. 3; and *Æ. macleayi*, p. 65, f. 4.

Flabellina. Mr. Angas, *l. c.*, describes and figures three species from South Australia: *F. janthina*, p. 66, pl. 6. f. 6; *F. ornata*, p. 67, f. 7; and *F. newcombi*, p. 68, f. 8.

HERMÆIDÆ.

Phyllobranchus, g.n., Alder and Hancock, near *Hermæa*: branchiæ leaf-like, with distinct footstalks; anus lateral. *Ph. (Proctonotus) orientalis*, Kelaart, figured by Alder and Hancock, Trans. Zool. Soc. v. pl. 33. fs. 18, 19. Ceylon.

ELYSIIDÆ.

Elysia coodgeensis, Angas, Journ. Conch. p. 69, pl. 6. f. 9, from Coodgee Bay, South Australia.

Order HETEROPODA.

IANTHINIDÆ.

Dr. FRITZ MÜLLER has published his examinations of "*some peculiar structures in the seminal fluid of Ianthina*," Ann. & Mag. Nat. Hist. xiv. pp. 430-433. At the first glance they may be taken for parasitic worms with a head- and tail-portion, covered with hairs; but they were finally recognized by the author as an essential element of the semen, which may be compared to the spermatophora of other mollusks, the hairs mentioned being the seminal filaments (*spermatozoidia*).

Order PULMONIFERA INOPERCULATA.

Suborder GEOPHILA.

SANDERS, A. On the anatomy of *Helix adpersa*. Quart. Journ. Microsc. Sc. 1864, iv. pp. 146, 147.

The gland which is frequently named the ovary contains zoosperms in immense number, together with ova in all stages of development, and therefore must be regarded as testicle as well as ovary [as has been stated long ago by Siebold, Gegenbaur, and others].—Some objections against this view are raised by Mr. Lawson, *ibid.* p. 204, and answered by Mr. Sanders, pp. 294, 295.

M. BOURGUIGNAT also has expressed an opinion on the hermaphroditism of the animals of this order, in his 'Malacologie de la Grande Chartreuse,' p. 61: "Pour nous, les mollusques gas-

téropodes androgynes, comme les *Helix* par exemple, ne se fécondent pas mutuellement. Dans l'acte de l'accouplement, une Hélice joue tantôt le rôle de mâle, tantôt celui de femelle." After copulation, the genital organs show a difference in appearance, dependent on the circumstance of whether the snail has acted as male or female. The *sagitta amatoria* of the individual acting as female, is said to have the function of arresting the penis of the male, so that it does not penetrate too deeply. A more elaborate paper on this subject is promised by the author under the title "Etudes anatomo-physiologiques sur les Mollusques," 4to, with coloured plates; but we are not aware that it has been published. The statements made by the author in the memoir quoted above, appear to us to be too general and theoretical to be convincing.

Hr. LEHMANN has published a paper entitled "Beschreibung einiger Schnecken-thiere," in Pfeiff. Mal. Blätt. 1864, pp. 44-53, with one plate. He describes the external soft parts and the anatomy of the following species:—*Helix thyroides* (Say), *H. albolabris* (Say), *Bulimus (Limicolaria) adansonii* (Pfr.), and "*Bulimus undatus* (Brug.)," the latter from Costa Rica. The systematic position generally assigned to these shells is confirmed by the examination of the maxilla: viz., that the first two are true *Helices*, the third belongs to the subfamily including the African *Achatina* and the large American *Bulimi*, and that *Bulimus undatus*, or better *Orthalicus*, is distinguished by a maxilla composed of seven pieces.

Also M. STABILE in the memoir on the Mollusks of Piedmont, which we have quoted above, has given some very remarkable observations on the maxillæ and tongue of these mollusks. The systematic arrangement which he has based on the former nearly coincides with that proposed by Mörch. Several remarks on some exotic genera of Land-snails (*Tennentia*, *Parmarion*, *Helicarion*, *Camptonyx*) are added.

Hr. MÖRCH, who had given in the 'Malakozoologische Blätter' of the year 1859 an arrangement of the *Helicidæ* based upon the maxillæ, modifies it in the 'Synopsis Molluscorum terrestrium et fluviatilium Danicæ,' p. 5, thus:—

A. Orificium organorum generationis commune.

<i>Oxygnatha.</i>	<i>Aulacognatha.</i>	<i>Odontognatha.</i>
Maxilla lævis, acie simplice.	Maxilla sulcata, acie crenulata.	Maxilla costata, acie dentata.
Limacæ.	Arionidæ.	_____
Vitrinæ.	Leucozonæ.	Xerophilæ.
Zonitidæ.	Atæniæ.	Ariantidæ.
_____	_____	Pentatæniæ.
Clausiliæ.	Bulimi.	_____
Cæcilioides.	_____	_____

B. Orificia org. gen. externa discreta, in fundo sulci.

One division only; *Elasmognatha*.

Maxilla postice lamina expansa, acie medio producta.

Succiniere.

In a footnote the following genera are mentioned as forming another division, *Agnatha* (maxilla absent), without doubt belonging to A, viz. *Testacella*, *Daudebardia*, *Glandina*, *Streptaxis*, and *Cylindrella*. The *Leucozoonæ* correspond to the group *Fruticicola* in Albers's arrangement, or to the genus *Hygromia* in that of Adams; the *Ateniæ* include *Discus*, Fitz. (*Patula*, Held, *Acanthinula*, Beck), and *Vallonia*, Risso; in the *Xerophilæ*, the group so named by Held (= *Theba*, Risso part., Adams, and called *Jacosta* by Mörch) is somewhat singularly united with *Helix fruticum*; the *Pentateniæ* (the name is given by Ad. Schmidt) comprise *Tachea* = *Helicogena* (Risso) and *Pomatia* = *Helix* (Adams). However, in the principal part of his "Synopsis" the author does not adhere to the arrangement proposed by him, but retains that which is generally adopted at present, commencing with the shell-less snails and ending with the turreted shells.

Mr. MORSE, in the "Synopsis of the terrestrial and fluviatile Mollusca of the State of Maine," arranges the land-snails in the following manner:

Fam. 1. LIMACIDÆ, containing *Arioninæ* and *Limacinæ*.

Fam. 2. PHILOMYCIDÆ: *Tebennophorus*.

Fam. 3. HELICIDÆ, corresponding to *Helix* and *Vitrina* of Dr. Pfeiffer.

Subfam. 1. *Helicinæ*: the larger and more elevated species of *Helix*, including *H. alternata*.

" 2. *Vitrininæ* = *Vitrina*, Drap., Pfr.

" 3. *Helicellinæ*: corresponding to the genera *Hyalina* and *Macrocyclus* of the second edition of Albers's 'Heliceen.'

" 4. *Valloninæ*: corresponding to the groups *Patula*, *Vallonia*, and *Gastrodonta* of the work mentioned.

" 5. *Punctinæ*.

Fam. 4. ORTHALICIDÆ: a combination of the Recorder's subfamily *Orthalicæ* with *Succinea*.

Subfam. *Succininæ*.

Fam. 5. PUPADÆ: corresponding to the *Pupacea* of the Recorder, and including *Zna*, *Pupa*, and *Fertigo*.

The new generic names proposed by Mr. Morse are, as far as we are aware, the following:—

Anguispira for *Helix alternata* (Say); *Pseudohyalina* for *H. minuscula*, Binney [*Microphysa*, Albers]; *Striatura* for two new species; *Strobila* for *Helix labyrinthica* (Say); *Helicodiscus* for *Helix lineata* (Say) [*Strobila* and *Helicodiscus* = *Gastrodonta*, Albers]; *Planogyra* for a new species, near *Vallonia*; *Punctum* for *Helix minutissima* (Lea); *Zoogenctes* for *Pupa harpa* (Say), the name indicating that this is a viviparous species; *Pullifera* for *Tebennophorus dorsalis* (Binney).

M. STABILE, in an appendix to his work 'Mollusques terrestres vivants du Piémont,' p. 111, &c., gives a general arrangement of the Land-snails according to the known differences in the structure of their jaws; it is nearly identical with that given by Mörch, but more complete as regards genera and subgenera. On pp. 114-117 the author treats of the differences in the form of the teeth of the radula, which are either simple, or bi-, tri-, or quadrifid, giving examples of the number of teeth in a single row, and of rows of teeth. The arrangement of the genera is the following:—

Oxygnatha.

- a. Limax. Philomycus. Tennentia. Parmarion. Helicarion. Vitrina. Zonites.
- b. Macrocyclus.
- c. Simpulopsis, Pellicula.
- d. Omalonyx.

Aulacognatha.

- a. Ariophanta.
- b. Parmacella. Helix, sect. Delomphalus [Patula], Bradybæna, and Sagda. Bulimus, sect. Buliminus, Zebrina, Chondrula, Azeca, and Zua. Stenogyra, sect. Rumina and Subulina. Pupa. Balia. Clausilia.

Odontognatha.

- a. Arion. Ariolimax. Megapelta. Vaginulus. Helix, sect. Trigonostoma, Drepanostoma, Fruticicola part., and Xerophila part.
- b. Liguus.
- c. Achatina.
- d. Limicolaria.
- e. Helix, sect. Ulota (H. fruticum), Xerophila part., Isognomostoma, Arianta, Campylæa, Iberus, Macularia, Tachea, and Pomatia. Borus.

Goniognatha.

- a. Bulimulus.
- b. Orthalicus.

Agnatha.

- Testacella. Daudebardia. Glandina. Cylindrella.

The authors of the different essays on classification mentioned in the preceding pages agree in one point, viz. in regarding the structure of the maxilla as a character of the greatest importance, and, we have no doubt, justly so. But the time is distant when we shall be able to rearrange the groups which have been based upon the shell, according to that other more important character. In the following review the Recorder will follow the arrangement proposed by him in the second edition of Albers's 'Heliceen,' with a few alterations only which have been rendered necessary by the latest researches; and although convinced that it is not

in accordance with natural affinities to leave all the genera without external shell united in one subfamily, he is compelled to take this course by the incomplete state of our knowledge of the structure of the maxillæ of numerous genera.

LIMACEA.

DUBREUIL, E. Procédé pour la préparation des Limaciens. Journ. Conch. 1864, pp. 243-245.

The form and colours of a slug cannot be preserved in spirits. Therefore the author proposes to kill and wash the animal in pure water, to which, after six or eight hours, some salt should be added; then skin the animal and preserve the cleaned skin glued to a piece of pasteboard and varnished. There are three preparations to be made—the first showing the back, the second the foot, and the third the right side with the pulmonary orifice. To render each part complete, for each of them the body should be opened by a longitudinal slit along the opposite side.

M. Stabile states that the colour of some species of *Arion* (for instance of *A. rufus*) is not inherent in the skin, but in the mucus; when the latter is removed, the colour is destroyed. Moll. terr. Piém. p. 125.

Vaginulus birmanicus, Theobald, Journ. As. Soc. Beng. 1864, p. 243, from Rangoon, Pegu, &c.

Limax cinereo-niger (Wolf). Stabile, Moll. terr. Piém. pl. 1. figs. 1 & 2, gives a figure of this species, agreeing with Heynemann, who considers it distinct from *L. maximus*, *L. (cinereus)*, Müll.). He distinguishes two varieties: *albipes*, with the sole whitish; and *nigripes*, with the sole black-edged. He says that *L. lineatus* (Dumont) is not specifically different.

Limax alpinus (Studer, Fér.). M. Bourguignat is of opinion that no such species exists in the Alps of France or Switzerland, but that it may have been established for a species of *Krynckillus* from Eastern Europe. Mal. de la Grande Chartr. p. 27.

Limax erythrus, Bourguignat, *ibid.* p. 33, pl. 2, uniform red; and *L. eubalius*, Bourguignat, *ibid.* p. 35, pl. 1. figs. 5-8, black-spotted: both from the Grande Chartreuse.—*Limax schwabi*, v. Frauenfeld, Verh. Zool. Bot. Ges. Wien, 1864, pl. 20, blue, from Moravia; *Limax viridis*, Theobald, Journ. As. Soc. Beng. 1864, p. 244, from Pegu.

Milax. Hr. Lehmann has given a contribution to the anatomy of *Amalia marginata* (Drp.), from which it appears that this genus is better reunited with *Limax*. Malac. Blätt. 1864, pp. 149-156.

Limacus is a new genus proposed by Lehmann, Malac. Blätt. 1864, pp. 145-149; it is very closely allied to *Limax*, from which it differs only by the sculpture of the shield and back, and by the internal shell being a membranaceous plate which contains calcareous laminae. Descriptions of the internal as well as of the external parts are given. *L. breckworthianus* from Victoria (Australia).

Arion dupuyanus, Bourguignat, Mal. de la Grande Chartreuse, p. 30, pl. 6. f. 1-4. Back keeled. Dauphiné.

Urocyclus, g. n., J. E. Gray, Proc. Zool. Soc. 1864, pp. 250, 251 (with a woodcut). It seems to be allied to *Arion*; the "subcaudal" (rectius supra-

caudal) gland is large and circular; the hinder margin of the mantle has a round deep pit. *U. kirkii*, from Central Africa.

Plutonina, g. n., Stabile, Moll. terr. du Piémont, p. 121, proposed for *Viquesnelia atlantica* (Morelet), from the Azores.

Tennentia (Humbert) is said to be quite distinct from *Parmarion* (with which it has been confounded by some malacologists), but very closely allied to *Mariaella* (Gray). Stabile, *l. c.* pp. 120 & 121.

Hoplites, a new genus indicated by Mr. Theobald from memory only, without specimen or notes; similar to *Vitrina*, a tough membranaceous plate on the back, without shell or shelly plate inside. Pegu.

AGNATHA (TESTACELLEA).

Glandina. M. Bourguignat proposes to distinguish the following species of Southern Europe and Northern Africa:—

G. algira, Brug. 1792; Chemn. Ed. nov. Bul. 17, 19–21; Fér. Hist. Nat. 136, f. 7; Bourg. Mal. Alg. pl. 7. f. 1–12. Algeria, Sicily, and Southern Italy.

G. dilatata, Ziegl., Beck, 1837; Mal. Alg. pl. 8. fs. 1–3. Algeria, Sicily, Ionian Islands, Epirus. [*G. algira*, var. *intermedia*, Martens, Malac. Blätt. vi. 1859, p. 161.]

G. sicula, Bourg., n. sp. “Spire very elongate, columella much arcuate.” Sicily.

G. poireti, Beck; Pfr. Moll. Deutschl. iii. 7, 3. 4; Fér. Hist. Nat. 136, 1–5. Dalmatia, Illyria, Carniola. [*G. algira*, var. *angustata*, Martens, *l. c.* p. 162.]

G. delesserti, Bourg. “Established by ourselves for a specimen which unfortunately was too young, and described by M. Mousson in a more scientific manner (1859) under the name of *Glandina compressa*.” Ionian Islands.

Streptaxis blanfordi, Theobald, Journ. As. Soc. Beng. 1864, p. 245; near *Str. andamanica*, from the Arakan Mountains. *Str. birmanica* (Blanford, MS.), Theobald, *l. c.*, from Pegu. *Str. johswichi*, Martens, Monatsber. Acad. Wiss. Berl. 1864, p. 528, from Siam, appears to be a variety of *Str. mouhotii* (Pfr.).

Cylindrella. The following Cuban species are described in Pfeiffer, Malac. Blätt. 1864: *Cylindrella striatella* (Wright), p. 2; *C. arcuistriata* (Wright), p. 3; *C. vignalensis* (Wright), p. 3; *C. decolorata* (Gundlach), p. 4; *C. fortis* (Gundlach), p. 5; *C. fumosa* (Gundlach), p. 5; *C. artemisiæ* (Gundlach), p. 6; *C. soluta* (Pfr.), p. 6; *C. albocrenata* (Gundlach), p. 7; *C. vineta* (Gundlach), p. 7; *C. brunnescens* (Gundlach), p. 8; *C. concreta* (Gundlach), p. 8; *C. capillacea* (Pfr.), p. 9; *C. sexdecimalis* (Jimeno), p. 9; *C. notata* (Gundlach), p. 10; *C. obliqua* (Pfr.), p. 11; *C. guirensis* (Gundlach), p. 11; *C. fusiformis* (Wright), p. 12; *C. lirata* (Jimeno), p. 12; *C. coronadoi* (Arango) [quære coronati], p. 13; *C. blainiana* (Gundlach), p. 13; *C. affinis* (Pfr.), p. 127; *C. violacea* (Wright), p. 128; *C. trilamellata* (Pfr.), p. 128; *C. plumbea* (Wright), p. 129; *C. adnata* (Pfr.), p. 129; *C. angustior* (Wright), p. 130; *C. illamellata* [sic] (Wright), p. 130.

OXYGNATHA (VITRINEA).

Vitrina. Mr. Theobald has described two species in Journ. As. Soc. Beng. 1864: *V. penguensis*, p. 244, from Pegu; and *V. christianæ*, p. 245, from the Andaman Islands.

Vitrina brevis (Fér.) has been kept alive for some time by M. Stabile (Moll. terr. Piém.). It feeds on cabbage, but never touches meat, either fresh or in a state of decomposition. Its eggs are rather gelatinous and adhere to one another.

Nanina. Dr. E. von Martens has described the following species in Monatsber. Acad. Wiss. Berl. 1864: *N. sulfurata*, p. 264, from Batjan and Halmahera; *N. parcipila*, p. 264, from the island of Adenare, near Flores; *N. riedelii*, p. 264, from Celebes, an=*securiformis*, Desh. ?; *N. amphidroma*, p. 265, from Sumatra, = *Helix martinii*, Pfr.; *N. albersi*, p. 265, from Malacca, is identical with *N. janus* of most collections, but not with *N. janus*, Clessm.; *N. rugata*, p. 528, from Celebes.—*Nanina hyalina*, p. 266, from Borneo, *N. fulvo-carnea*, ibid., from Celebes, and *N. aurea*, ibid., from Sumatra, belong to the group *Orobis* (Alb.)—*Nanina parietalis*, Martens, Malac. Blatt. 1864, p. 167, from Bengal, has proved to be identical with *N. laidleyana* (Bens.).

[*Nanina*] *Helix geiton*, Theobald, Journ. As. Soc. Beng. 1864, p. 242, from the Khasi Hills. "A dwarf *Helix climacterica*."

[*Nanina*] *Helix weinkauffiana* (Crosse and Fischer), described in the preceding volume of the Journal de Conchyliologie, 1863, p. 350, is figured this year, vol. xii. 1864, pl. 12. f. 7, together with the allied [*N.*] *H. crossei*, f. 6. Cochinchina.

[*Nanina*?] *Helix basileus*, Benson, 1861=*titanica*, Pfeiffer, 1862, inhabits the higher mountains of Southern India, at an altitude of 3300 feet above the level of the sea. Benson, Ann. & Mag. Nat. Hist. xiii. p. 496.

[*Nanina*] *Helix isabellina* (Pfr.), hitherto known from Ceylon only, occurs also in Southern India. Benson, l. c.

[*Nanina*] *Helix exul*, Theobald, Journ. As. Soc. Beng. p. 245. Andaman Islands.

*Trochomorpha** *appropinquata*, Martens, Monatsber. Acad. Wiss. Berl. 1864, p. 267, from Borneo; near *Tr. approximata* (Guillou, sp.).—*Tr. lardea*, Martens, l. c., from Amboina; allied to *Tr. planorbis* (Less. sp.).—*Tr. bicolor*, Martens, l. c., from Sumatra and Borneo.

Hyalina amboinensis, Martens, Monatsber. Acad. Wiss. Berl. 1864, p. 266; Amboina.

[*Hyalina*] *Zonites dumontianus*, Bourguignat, Malacol. Grande Chartreuse, p. 43, pl. 3. fs. 9-14 (Dauphiné). Closely allied to *Hyalina radiatula*, which is figured on the same plate, fs. 15-20.

HELICACEA (AULACOGNATHA).

Helix. It is impossible to recognize the natural affinities of numerous species of *Helix* described as new from the descriptions given, and therefore we prefer to enumerate them in a geographical order.

* *Trochomorpha* (Albers), which includes *Vidua* (Adams), was formerly considered by the Recorder a subgenus of *Nanina*, and by Mr. Adams a subgenus of *Zonites*. It may be regarded as a separate genus.

European species :—

Species from Northern Italy, hitherto confounded under the names of *Helix zonata* and *Helix planospira*, are distinguished by Stabile, Moll. terr. du Piém. pp. 50-64, as follows:—

1. *Helix zonata* (Studer): Alps of Switzerland, Piedmont, and Upper Lombardy.
2. *Helix fætens* (Studer, non auct.).
 - α . *transalpina*: Canton Wallis.
 - β . *cisalpina* (pl. 1. fig. 6): Some valleys of Upper Piedmont and of Lombardy.
3. *Helix ichtthyomma* (Held) = *fætens* (Rossm.): Tyrol, Engadin, Krain.
 - β . *achates* (Ziegler) = *cingulina* (Desh.): Tyrol, Krain, and Schneeberg, in Austria.
4. *Helix umbilicaris* (Brunati).
 - α . *typica*: *zonata* (C. Pfeiffer).
 - α . *illyrica*: Frioul and Illyria.
 - β . *italica* = *planospira*, part. (Lam.): Environs of Verona, Vicenza, Belluno, Massa, and Livorno.
 - b . *padana* (pl. 1. fig. 5): Upper Valley of the Po.
 - β . *euganea*: Euganean hills, in Venetia.

M. Stabile also states that *Helix hexagyra* (Mhlf. & Villa) has been founded on large specimens of *H. strigella* (Drap.); and that *H. galloprovincialis* (Dupuy) is a good species, identical with *H. carthusiana* (Drap.), but distinct from *H. cantiana* (Mont.) as well as from *H. carthusiana* (Müll.).

Helix ammonis (A. Schmidt, in litt.) allied to, and replacing the *H. erice-torum* in Piedmont, Lombardy, and a part of Venetia; its distinctive characters pointed out by Stabile, *l. c.* p. 46.

Helix depilata (Drap. Tabl., not Pfr.) = *edentula* (Drap.). M. Bourguignat has given a description of the shell and anatomy in Moll. Grande Chartr. p. 56, pl. 7. fs. 1-12; he criticises rather severely the anatomical figure given by A. Schmidt for *H. depilata* (C. Pfr.), which species is considered by the author identical with the other on this occasion (p. 58), whilst both are declared to be different on p. 56.—This snail belongs to the species with two sagittæ.

Helix juriniana, Bourguignat, Malac. d'Aix, p. 32, pl. 1. fs. 1-5, from Savoy. Allied to *H. dolopida* (Jan) and *H. incarnata* (Müll.).

Helix unifasciata (Poiret), var. *H. candidula* (Studer), is said to be an alpine variation from the French type, with the striae stronger, and the lip less thickened. Bourguignat, *l. c.* p. 40. Most authors have considered them synonymous.

Helix phorochætia, Bourguignat, Malac. Grande Chartr. p. 52, pl. 6. fs. 9-14, from the Dauphiné; near *H. villosa*, but smaller.—*H. bourniana*, Bourguignat, *ibid.* p. 54, pl. 7. fs. 13-17, from the Dauphiné; near *H. cæolata* (Stud.).

Helix alpina (F. B.) and *H. fontenillii* (Mich.). M. Bourguignat has

given descriptions of the shells and of the anatomy, from which it would appear that the two species are distinct; *l. c.* pp. 66-80, pls. 4-6.

Helix zonella, Pfeiffer, Proc. Zool. Soc. 1864, p. 604, from Crete.

North African species :—

Helix cottyi, Morelet, Journ. Conch. 1864, p. 155, from the border country between Marocco and Algeria.—*Helix warneriana*, Bourguignat, Moll. terr. et fluv. de la Sahara, from the south of Tunis; *H. duveyriana*, Bourguignat, *ibid.*, from the Oasis Mechounech near Biskin.

Helix ehrenbergi, var. *chilembia*, Bourguignat, Moll. nouv. iv. p. 85, pl. 12, from Alexandria; a variety with the lip of the aperture much thickened.

Helix barbara (L.) is declared by M. Bourguignat to be identical with *Bulimus ventricosus*, Drap. [*Helix* (*Cochlicella*) *ventricosa*], and not with *Bulimus jeannoti*, Tewel, as has been believed by several other authors. Malac. Algér. iii. p. 12 & i. p. 86.

Madeiran species :—

M. de Paiva has described and figured the following species in Pfeiffer's Malacolog. Blatt. 1864: *H. galeata* (Paiva), p. 51, pl. 2. fs. 1-3; *H. tetrica* (Paiva), p. 53, fs. 4-7; *H. delphinuloides* (Lowe), fs. 14-17; *H. coronata* (Lowe), p. 55, fs. 8-11; the latter species has been known in a fossil state only. M. de Paiva found specimens alive, although slightly different from the fossil ones.

West Asiatic species :—

M. Bourguignat has described three species in Moll. Nouv. iv.: *Helix kurdistanica*, p. 87, pl. 13. fs. 1-4, from Kurdistan; *H. michoniana*, p. 89, pl. 14. fs. 5-8, from Kurdistan and Diarbekir; *H. escheriana* (Mousson, MS.), p. 105, pl. 15. fs. 8-11, from Mesopotamia, allied to *H. guttata* (Olivier), but with an open umbilicus, showing a similar relation to that species, as *H. campesina* to *H. alonensis*.

Central Asiatic species :—

Helix plectotropis, Martens, Mal. Blatt. p. 114, pl. 3. fs. 3-5, from the mountain Thianschan; somewhat similar to *H. nummus* and *H. trichotropis*; *H. semenowi*, Martens, *l. c.* p. 115, pl. 3. fs. 6-8, from the Thianschan, a *Xerophila* near *H. destituta*, Charp.

Chinese and Japanese species :—

Helix arcasiana, Crosse et Debeaux, Journ. Conch. xi. 1863, p. 386, and xii. 1864, p. 310, pl. 12. f. 4, from Shanghai; near *H. tourannensis*, Eyd. et Souleyet.—*H. yantaiensis*, Crosse et Debeaux, *l. c.* xi. 1863, p. 387, and xii. 1864, p. 317, pl. 12. f. 2, from Yantai near Cheefoo, Northern China; a toothed species, somewhat resembling *H. personata*.—*H. tschefouensis*, Crosse et Debeaux, *l. c.* p. 318, pl. 12. f. 5.—*H. munieriana*, Crosse, *l. c.* xi. 1863, p. 387, non *H. munieriana*, Desh.=*H. shanghaiensis*, Pfr.; from Cheefoo in Northern China.—*H. frilleyi*, Crosse et Debeaux, *l. c.* xi. 1863, p. 387, and xii. 1864, p. 319, pl. 12. f. 3, from Ki-tsen-soo near Cheefoo. (= *H. redfeldi*, Pfr.)—*H. primeana*, Crosse, Journ. Conch. p. 284, from China? near *H. pallasiana*, Pfr.—

H. bocageana, Crosse, l. c. p. 286, from China?—*H. friedeliana*, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 523, from Nagasaki, belonging to the group *Ægista*, Alb.

Species from Continental India and Ceylon:—

Helix palmaria, Benson, Ann. & Mag. Nat. Hist. 1864, xiii. p. 137, from Mysore.—*H. contracta* (Hutton, MS.), Benson, l. c., from Malwa; allied to *H. nilagirica* (Pfr.).—*H. neherensis*, Benson, l. c. p. 210, from Mahabaleshwar.—*H. humberti*, Brot, Journ. Conch. p. 21, pl. 2. figs. 5, 6, from Ceylon; figures of the allied species *H. erronea*, *ricolii* and *charpentieri* are given on the same plate.—*H. billeheusti*, Crosse et Fischer, Journ. Conch. p. 327, pl. 13. f. 8, from Cochinchina; allied to *H. infula* (Bens.)?

Helix bouyeri from Cochinchina. The name of this species is corrected into *H. bouyeri*. Crosse et Fischer, Journ. Conch. 1864, p. 326.

Helix similis, *H. fallaciosus*, *H. vittata*, etc. Mr. Theobald's paper on the varieties of these species has been mentioned above, p. 197.

Species from the Indian Archipelago:—

Dr. v. Martens has described the following species in Monatsber. Acad. Wiss. Berl. 1864:—

Helix quadrispira, p. 267, from Ceram.—*H. lutea*, p. 268, from Booroo; allied to *H. obscurata* (Adams).—*H. sumatrana*, p. 523, allied to *H. rotatoria* (Busch).—*H. conulus*, p. 523, from Sumatra.—*H. milium*, p. 524, from Amboyna.—*H. mendax*, p. 524, from Timor; allied to *H. argillacea* (Fér.) and *H. similis* (Fér.).—*H. unguiculastra*, p. 524, from Amboyna and Booroo, belonging to the group of *H. unguina* (L.), and very closely allied to *H. ceramensis* and *H. flexuosa* (Pfr.).—*H. mersispira*, p. 525, from the island of Moti, Moluccas; intermediate between the groups of *H. unguicula* and *H. zonaria*.—*H. biconvexa*, p. 526, from the island of Tawalli, Moluccas; allied to *H. scheepmakeri* (Pfr.).—*H. aurita*, p. 269, from the Moluccas; allied to *H. scheepmakeri* (Pfr.).—*H. anozona*, p. 269, from Batjan; perhaps identical with *H. expansa* (Pfr.).—*H. calcar*, p. 525, from Halmahera (Gilolo); allied to *H. rota* (Brod.).—*H. flaveola*, p. 525, from Southern Celebes; belonging to the group *Planispira* (Beck); [the specific appellation *flaveola* having been already given to another species of *Helix* by Krynicki in 1847 (reestablished by Mousson in 1863), the above name may be changed into *H. flavidula*.]—*H. endoptycha*, p. 268, from Ternate and Batjan, allied to *H. grate-loupi*.—*H. instricta*, p. 268, from Ternate, belonging to the group *Planispira* (Beck).

Helix peaseana, Pfeiffer, Proc. Zool. Soc. 1864, p. 603, from Timor.—*Helix brotii* and *H. sinistra*, Bonnet, Rev. Zool. no. 3, from Borneo [an *Nanina* ?].

Cochlostyla pubicepa, Martens, Monatsber. Akad. Wiss. Berl. 1864, p. 269, from Halmahera and Batjan; allied to *Helix granulata* (Quoy et Gaimard).—*C. sulcocincta*, Martens, ibid. p. 276, from Halmahera; allied to *H. illustris* (Pfr.).

South African species:—

Mr. Benson has described the following species from the Cape of Good Hope, Ann. & Mag. Nat. Hist. 1864, xiii. :—

Helix arnotti, p. 491; *H. phytostylus*, p. 492; *H. capsula*, p. 492; *H. hudsoniæ*, p. 493; *H. prionacis*, p. 493; *H. browningii*, p. 493; and *H. omphalion*, p. 494.

Australian species :—

Mr. Cox has published descriptions of the following species in his 'Catalogue of Australian Land-shells' and in the Ann. & Mag. Nat. Hist. xiv. pp. 180-184:

Helix blomfieldi, Catal. Austral. Land-shells, p. 19, Port Curtis; *H. mitchellæ*, p. 19, Clarence River; *H. mastersi*, p. 19, New South Wales; *H. stroudensis*, p. 20, Stroud, Port Stephens; *H. marmorata*, p. 20, Port Curtis, &c. (there exists already a *Helix marmorata*, Férussac): *H. strangeoides*, p. 20, Moreton Bay (nomen horribile dictu); *H. parramattensis*, p. 20, Parramatta; *H. lyndhurstensis*, p. 21, Lyndhurst, Sydney; *H. microscopica*, p. 21, Stroud (there exists already a *H. microscopica*, Krauss); *H. conoidea*, p. 21, Port Stephens (non *H. conoidea*, Draparnaud); *H. paradoxa*, p. 21, Stroud Road, Campbelltown; *H. krefftii*, p. 21, Cape York; *H. belli*, p. 22, Sydney; *H. mortii*, p. 22, Sydney; *H. leichardti*, p. 35, allied to *H. ptychomphala*; *H. saturni*, p. 35, and Ann. & Mag. Nat. Hist. 1864, xiv. p. 184, as *H. costulata*, Sydney; *H. alexandrae*, p. 35, Sydney; *H. scotti*, p. 36, Wollongong, New South Wales; *H. macleayi*, p. 36, Port Denison; *H. cerea*, p. 36, and Proc. Zool. Soc. 1864, p. 40, as *H. forbesi*, from Port Denison, allied to *H. incei*; *H. sydneyensis*, p. 37, Sydney; *H. murphyi*, p. 37, Wollongong; *H. lirata*, p. 38, Sydney, allied to *H. saturni*; *H. mariae*, Proc. Zool. Soc. 1864, p. 594, Clarence River; *H. assimilians*, ibid. p. 595, Clarence River, allied to *H. strangei*; *H. wilcoxi*, and *H. clarencensis*, ibid.

Helix seminigra, Morelet, Journ. Conch. p. 289, Queensland.

Species from the Islands of the Pacific :—

Helix (Corasia) anadyomene, Adams et Angas, Proc. Zool. Soc. 1864, p. 38, Guadalcanar, Solomon Islands; *Helix lieardiana*, Crosse, Journ. Conch. p. 282, Solomon Islands, allied to *H. leucothoë* (Pfr.); *H. hidalgoiana*, Crosse, ibid. p. 283, "Oceania," allied to *H. benigna* (Pfr.); *H. cailleti*, ibid. p. 285, "Oceania," allied to *H. murina* (Pfr.); *H. mabillei*, Crosse, ibid. p. 285, "Oceania," allied to the preceding.

Mr. Pease (Proc. Zool. Soc. 1864, pp. 669 & 670) has described the following species, which are probably from the Sandwich Islands :—

Helix obconica, *H. normalis*, *H. simillima*, *H. fabrefacta*, *H. ficta*, *H. sculptilis* (Mangier Island), *H. retusa*, *H. depressiformis*, and *H. prostrata*.

North American species :—

Not having seen Mr. Morse's memoir on the Mollusks of the State of Maine, we are only enabled to mention the following species described by him as new: *Striatura milium* and *Str. ferrea*, *Planogyra asteriscus* and *Hyalina binneyi*.

West-Indian species :—

Helix versicolor (Born). Specimens entirely agreeing with those figured by Férussac were found in Cuba. Pfeiffer, Malac. Blatt. 1864, p. 108.

Helix alauda (Fér.). Pfeiffer, l. c. p. 125, describes some remarkable varieties of this species from Cuba.

Helix brocheri (Gutierrez), Pfeiffer, l. c. p. 124, from Cuba, belonging to the group of *H. muscarum*.—*H. schwartziana*, Pfeiffer, l. c. p. 125, from Cuba.—*H. reiniana*, Pfeiffer, l. c. p. 1, from Bermudas.—*H. discrepans*, Pfeiffer, l. c., from Bermudas; allied to *H. circumfirmata* (Redf.).

South American species :—

Helix vitrea, Bonnet, Rev. Zool. no. 3. South America.

Bulimus, group Amphidromus.

Bulimus annamiticus, Crosse et Fischer, Journ. Conch. 1864, p. 329, pl. 12. f. 8, described in the preceding volume (xi.), 1863, p. 357, from Cochinchina.—*Bulimus leucozanthus*, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 526; locality unknown; closely allied to *B. atricallosus* (Gould).—*Bulimus suspectus*, Martens, l. c., from Timor; allied to *B. lævus* (Müll.).—*Bulimus sumatranus*, Martens, l. c., from Sumatra; allied to *B. porcellanus* (Mouss.).

Bulimus, group Placostylus, &c.

CROSSE, H. Etude critique sur les Bulimes auriculiformes de la Nouvelle Calédonie et des terres voisines. Journ. Conch. 1864, pp. 105–151.

Although this memoir does not contain descriptions of new species, it is nevertheless of great value, the author having given a complete list and comparative descriptions of twenty-three species and of some remarkable varieties which have been regarded by other authors as distinct species. It cannot be denied that they form a most natural series, although, at the first glance, the first and last of the series seem to be widely different from each other; they would form the groups named by Albers *Placostylus*, *Eumecostylus*, and *Charis*. Also M. Crosse refers the species to three subdivisions, which, however, do not exactly correspond to those proposed by Albers. The first with *B. fibratus*, and the second with *B. bovinus*, Brug. = *shongi*, Less., as types, are identical with *Placostylus*, whilst the third, including *B. cleryi*, *B. malleatus*, and *B. miltochilus*, would correspond to *Eumecostylus* and *Charis* of Albers.—Two species are figured: *B. fuliginus* (Pfr.), pl. 7. fig. 4, and *B.* (formerly *Partula*) *salomonis* (Pfr.), fig. 5.

Bulimus æthiops and *B. obsoletus*, Morelet, Journ. Conch. 1864, pp. 157 & 158, from West Africa [*Limicolaria*?].

Achatina spekei, Dohrn, Proc. Zool. Soc. 1864, p. 117, from Lake N'yanza; allied to *A. ustulata* (Lam.).

ORTHALICEA.

Bulimus moestai, Dunker, Malac. Blätt. 1864, p. 156, from Atacama, Peru. [*Bulimulus*, group *Plectostylus*.]

Balimus pictus and *B. amœnus*, Bonnet, Rev. Zool. no. 3, from Peru. [Like the preceding, these species perhaps ought to be referred to *Bulimulus*.]

Orthalicus. Prof. Troschel's description of the peculiar structure of the maxilla is confirmed by Lehmann, Malac. Blätt. 1864, p. 52.

PUPACEA.

We have proposed to place here all those species of *Bulimus* which, from their affinity to other better-known species, are supposed to have the maxilla slightly striated, adopting for them the generic name of *Buliminus*.

Buliminus spilozonus, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 527, from Celebes and Timor. [Group *Rhachis*, Albers.]

Bulimus walli, Cox, Catal. Austr. Land-shells, p. 24, from Rockhampton; *B. onslowi*, Cox, l. c. p. 25, from Shark's Bay; *B. jacksonensis*, Cox, l. c., from Port Jackson.—The same three species are described in Ann. & Mag. Nat. Hist. 1864, xiv. p. 185.

Bulimus electrinus, Morelet, Journ. Conch. 1864, p. 158, from Guinea [*Rhachis*?]; *B. ingenuus*, Morelet, l. c. p. 236, from Mayotte Island (Mossambique); *B. spinula*, Morelet, l. c. p. 287, from the Gaboon.

Bulimus letourneuxi, Bourguignat, Malac. Algér. iv. p. 9, pl. 2. figs. 5–8, representing the European *B. montanus* (Dr.); *B. numidicus*, Bourguignat, l. c. p. 15, pl. 2. figs. 29–32; *B. brondelianus*, Bourguignat, l. c. p. 16, pl. 2. figs. 23–28. [The two latter belong to the group *Napæus* (Beck) = *Ena* (Leach).]

Buliminus (Chondrula) lepidulus, Adams & Angas, Proc. Zool. Soc. 1864, p. 38, from Sharks' Bay.

[*Partula*] *Bulimus turgidus*, *B. argutus*, *B. annectens*, Pease, Proc. Zool. Soc. 1864, p. 670; perhaps from the Sandwich Islands.

Partula. Mr. Pease, l. c., describes the following species: *P. producta*, p. 671; *P. lignaria*, p. 671; *P. clara*, p. 671, perhaps identical with *P. hyalina* (Brod.); *P. attenuata*, p. 672; *P. planilabrum*, p. 672; *P. (? var.) lugubris*, p. 672, perhaps identical with *P. pacifica* (Pfr.); *P. garrettii*, p. 672. All these species are perhaps from the Sandwich Islands.

Lamellina lævis, Pease, l. c. p. 672; from the Sandwich Islands? (= *L. serrata*, Pease?).

Tornatellina aperta, *T. oblonga*, and *T. simplex*, Pease, l. c. p. 673, from the Sandwich Islands?

Cionella sumatrana, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 527, from Sumatra; belonging to the group *Glessula* (Mart.), near *C. oreas* (Bens.).

[*Cionella*] *Achatina arthuri*, Benson, Ann. & Mag. Nat. Hist. 1864, xiii. p. 209, from Mahabaleshwar.

Ferussacia [= *Cionella*]. M. Bourguignat enumerates the known species of this genus in Malac. Algér. iv. pp. 24–34, and

in Moll. nouv. litig. et peu conn. iv. pp. 117-130, referring them to four subdivisions:—

Sect. *Zua* (Leach); type *Z. subcylindrica* (L.) = *lubrica* (Müll.).

Sect. *Euferrussacia* (Bourg.).

Group *Folliculina* (Bourg.); type *F. folliculus* (Gron.).

Group *Procerulana* (Bourg.); type *F. procerula* (Morelet).

Group *Hohenwartiana* (Bourg.); type *F. hohenwarti* (Rossm.).

He describes the following Algerian species:—

Ferrussacia subcylindrica (L.); *F. amaurobia* (Bourg.), which was figured, but not described by him in 'Malacologie du Château d'If, 1860,' is described at length and compared with *F. regularis* (Bourg.) and *F. folliculus*, p. 37, pl. 3. figs. 10-12 (*F. regularis*, figs. 7-9; *F. folliculus*, figs. 4-6); *F. amblya*, p. 40, pl. 3. figs. 13-15; *F. forbesi* (*nitidissima*, Forbes, non Krynicki), p. 39, pl. 3. figs. 16-18; *F. procchia*, p. 44, pl. 3. figs. 26-28; *F. abromia*, p. 45, pl. 3. figs. 29-31; *F. agræcia*, p. 51, pl. 3. figs. 36-38; *F. (Pegæa) carnea* (Risso) = *Tornatellina fraseri* (Pfr.), p. 50, pl. 3. figs. 32-35; *F. charopia*, p. 54, pl. 4. figs. 8-10; *F. celosia*, pp. 32 & 57, pl. 4. figs. 14-16; *F. scaptoria*, p. 61, pl. 4. figs. 23-25; *F. terveri* (1856), p. 64, pl. 5. figs. 1-3 = *folliculus* of Michaud and Terver's Catalogue of Algerian shells; *F. abia*, p. 65, pl. 4. figs. 31-34; *F. eucharista*, p. 67, pl. 4. figs. 45-47; *F. bourguignatiana* (Benoit, 1862), p. 68, pl. 4. figs. 35-40; *F. thamnophila*, p. 69, pl. 4. figs. 41-44 (*F. gronoviana*, Risso, from Nice, is figured for comparison, pl. 3. figs. 19-21); *F. vescoi* (Pfr., 1849), pl. 3. figs. 22-25; *F. emychia*, pl. 4. figs. 17-19; *F. procerula* (Morelet), pl. 4. figs. 5-7; *F. debilis* (Morelet), pl. 4. figs. 20-22; *F. gracilentia* (Morelet), pl. 4. figs. 26-30.

Ferrussacia rothi, Bourguignat, Moll. nouv. iv. p. 108, pl. 19. figs. 13-16, from Jerusalem; *F. moussoniana*, Bourg. l. c. p. 111, pl. 19. figs. 5-8, from Jerusalem; *F. sauleyi*, Bourg. l. c. p. 113, pl. 19. figs. 9-12, from Sayda in Syria; *F. michoniana*, Bourg. p. 114, pl. 19. figs. 17-20, from Jerusalem.

Azeca. M. Bourguignat enumerates the known species of this genus, referring them to four groups, as proposed by him in *Amén. Malacol.* ii. 1859. One species, *A. psatyrolena* (Bourg.), without teeth, is found in Algeria. *Malac. Algér.* iii. p. 22, pl. 2. figs. 45-47.

Cæcilianella (Bourg. 1856) = *Acicula*, Risso. M. Bourguignat enumerates seventeen species of this genus, all from Europe and the adjacent regions, *Malacol. Algér.* iv. pp. 110-111. The following occur in Algeria: *C. nanodea* (Bourg. 1856), iv. p. 111, v. pl. 8. figs. 4-6; *C. letourneuri* (Bourg.) = *Achatina acicula*, Forbes in *Ann. & Mag. Nat. Hist.* 1838, non auct. iv. p. 112, v. pl. 8. figs. 10-12; *C. brondeli* (Bourg. 1856), iv. p. 113, v. pl. 8. figs. 13-15; *C. raphidia* (Bourg. 1856), iv. p. 115, v. pl. 8. figs. 7-9.

Cæcilianella uniplicata, Bourguignat, *Malacol. d'Aix-les-Bains*, p. 55, pl. 2. figs. 3-5, from Savoy.

Cæcilianella aciculoides (Jan, 1832) is fully described by Stabile (*Moll. terr. Piém.* p. 77), who compares it with *C. acicula*, and regards it as identical with *C. veneta* (Charp.), *C. jani* (Bielz), and *C. acicula* (Betta), whilst Betta's *C. aciculoides* proves to be the true *C. acicula*.

Macroceramus. The following species from Cuba are described by Pfeiffer, Malacol. Blatt. 1864: *M. pupoides* (Pfr.), p. 15; *M. variabilis* (Pfr.), p. 15; *M. crenatus* (Gundlach), p. 16; *M. costellaris* (Gundlach), p. 16; *M. denticulatus* (Gundlach), p. 17; *M. nigropictus* (Gundlach), p. 17; *M. latus* (Gundlach), p. 17; *M. elegans* (Gundlach), p. 18; *M. palenquensis* (Gundlach), p. 18; *M. simplex* (Pfr.), p. 19; *M. poeyi* (Pfr.), p. 126; *M. infradenticulatus* (Wright), p. 127.

Balea spelt *Balia* by Stabile (Moll. terr. Piém.), who derives it from βαλιός, spotted. In our opinion, the name is a nonsensical compound of letters, like other generic names introduced by Leach.

Clausilia laminata (Mont. sp.). Variations of coloration (greenish and purple) are figured by Bourguignat, Mal. de la Grande Chartreuse, pl. 8. figs. 1-8.

Clausilia alpina and *Cl. thomasiana*, var. *verbanensis*, both published by M. Stabile in the year 1857, are figured by him in Moll. terr. Piém. pl. 2. figs. 3 and 2. He establishes for them and for *Cl. diodon* a new section in the genus *Clausilia*, which he names *Charpentieria* (p. 80), distinguished from *Marpessa* (type *Cl. laminata*, Mont.) by not having the clausilium emarginate. *Charpentieria* appears to be very near to the section named *Fusulus* by Pfeiffer and the Recorder; but as the latter name was originally used by its author, Fitzinger, in a very much wider sense, there would be no serious objection to adopt the name proposed by M. Stabile even for a combination of those two sections. It is remarkable that *Cl. laminata* (Mont.), although widely spread in Europe, has not been found in Piedmont.

Clausilia mella, sp. n., Stabile, l. c. p. 89, pl. 2. fig. 1, from Piedmont; section *Plicaphora*.—*Clausilia proxima*, sp. n., Walderdorff, Verhandl. Zool. Bot. Ges. Wien, xiv. 1864, p. 508, from Cattaro, in Dalmatia.

Hr. Pfeiffer describes five species of *Clausilia* from Crete, in Proc. Zool. Soc. 1864, pp. 604, 605: *C. glabella*, *C. extensa*, *C. tenuicostata*, *C. rudis*, and *C. distans*.

Clausilia letourneuzi, Bourguignat, Malacol. Algér. iv. p. 75, pl. . f. : "Rufocornea, argute striatula, apertura basi subcanaliculata, plica lunata crassa, plicis palatalibus duabus," &c. From Algiers.—As regards the other Algerian species of this genus, we refer to our notes in the geographical part of our Record.

Clausilia masoni, Theobald, Journ. As. Soc. Beng. 1864, p. 246, from the Tonghoo Mountains, between Pegu and Martaban.

Clausilia sumatrana, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 270, from Sumatra; *Cl. moluccensis*, Martens, ibid., from Halmahera; *Cl. excurrens*, Martens, ibid. p. 527, from Sumatra.

Pupa secale, var. *bourguignat*, Bourguignat, Mal. d'Aix, p. 49, pl. 2. figs. 1, 2.

Pupa mortilleti, sp. n., Stabile, Moll. terr. Piém. p. 96, pl. 2. fig. 4, from the alpine region of the valley of Stura, closely allied to *P. variabilis* (Drap.), which is also figured, pl. 2. fig. 5, under the old name of *P. multidentata* (Oliv.), the correct identification of which must appear very doubtful. The Recorder referred some years ago *Bulimus cinereus* (Mortillet) to the genus *Pupa*, changing the name into *Pupa mortilleti*, because there exists already a *Pupa cinerea* (*P. quinquedentata* of others). Therefore the species described by M. Stabile must receive another name, and we propose for it that of *P. stabili*.

Pupa triplicata (Stud.), figured by Bourguignat, Mal. de la Grande Char- treuse, pl. 8. figs. 9-12, varying in the length of the shell.

Pupa thibetica, Benson, Ann. & Mag. Nat. Hist. 1864, xiii. p. 138, from Iskardo, Thibet, allied to *P. huttoniana*; *P. eurina*, Benson, l. c. p. 139, from Tribeni Ghat, River Gogra, East Indies, allied to *P. muscorum* (L.).

Pupa letourneuxi, Bourguignat, Malac. Algér. iv. p. 78, pl. 5. figs. 19-22, found with *Clausilia letourneuxi* and *bidens*; *P. lallemantiana*, Bourguignat, l. c. p. 80, pl. 5. figs. 23-27, found with the former; *P. brondeli*, Bourguignat, l. c. p. 88, pl. 5. figs. 43-47, allied to *P. michaudi*; *P. poupillieri*, Bourguignat, l. c. v. p. 89, pl. 6. figs. 4-7; *P. aucapitainiana*, Bourguignat, l. c. v. p. 95, pl. 6. figs. 17-19.

Pupa umbilicata (Drap.). Young and adult specimens from Algeria are figured by Bourguignat in Malac. Algér. v. pl. 6. figs. 8-16.

Pupa michaudi (Tewer), figured from the type by Bourguignat, l. c. iv. pl. 5. figs. 39-42.

Pupa fryali, *P. pampherodon*, and *P. dadion*, Benson, Ann. & Mag. Nat. Hist. 1864, xiii. p. 495, from the Cape of Good Hope.

Pupa kingi, Cox, Catal. Austral. Land-shells, p. 28, from Parramatta; *P. ramsayi*, Cox, ibid., from Port Lowly.—These two species are also described in Ann. & Mag. Nat. Hist. xiv. pp. 183 & 184.

Pupa nelsoni, Cox, Catal. Austral. Land-shells, p. 29, from Nelson's Bay (New South Wales); *P. mastersi*, Cox, ibid., from Wollongong (New South Wales).—*Pupa varia*, Bonnet, Rev. Zool. no. 3; Tasmania.

Pupa ofella, Benson, Ann. & Mag. Nat. Hist. xiii. p. 139, Ceylon [*Ennea*?].

Pupa ascendens, Martens, Monatsb. Akad. Wiss. Berl. 1864, p. 528, from Amboina. Approaching *Hypotrema*.

Vertigo. M. Stabile proposes for the species with the whorls turned to the right the sectional name of *Dexiogyra*, and for those turned to the left, that of *Vertilla*. Moll. terr. Piém. pp. 104 & 106.

Vertigo. M. Bourguignat figures in Malac. Algér. the *V. dupoteti* (Terver), v. pl. 6. figs. 25-27, and describes and figures the following new species: *V. numidica* (= *Pupa anglica*, Morelet, Cat. Moll. Alg.), iv. p. 100, v. pl. 6. figs. 33-35; *V. aprion*, iv. p. 101, v. pl. 6. figs. 36-38; *V. codia*, iv. p. 102, v. pl. 6. figs. 39-41; *V. microlena*, iv. p. 104, v. pl. 6. figs. 42-44; *V. discheilia*, iv. p. 105, v. pl. 6. figs. 45-47; *V. maresi*, iv. p. 106, v. pl. 6. figs. 48-50.

SUCCINEÆ.

Succinea. Mr. Cox has described four new species in his Catal. Austr. Land-shells, the three first being also described in Ann. & Mag. Nat. Hist. 1864, xiv. p. 183: *S. nortoni*, p. 27, from New South Wales; *S. macgillivrayi*, p. 27, from New South Wales; *S. rhodostoma*, p. 27, from Point Lowly, South Australia; *S. eucalypti*, p. 38, from New South Wales.

Succinea strigillata, Adams and Angas, Proc. Zool. Soc. 1864, p. 38, from Sharks' Bay (N.W. Australia); *Succinea costulosa*, Pease, ibid. p. 677, from Tahiti.

Suborder LIMNOPHILA.

AURICULACEA.

Alexia (Leach). M. Bourguignat enumerates twenty-one species, all being recent, and most of them European; some are from the Azores, Madeira, and Canary Islands. He includes the genus *Leuconia* (Gray) and some of Pfeiffer's *Marinula*, in which we agree with him. Four species have been found in Algeria, viz. *A. myosotis* (Drap.), Malac. Algér. v. pl. 8. figs. 20-22; *A. micheli* (Mittre), figs. 34-39; *A. firmini* (Payk.), figs. 40-44; and a new species, *A. algerica*, iv. p. 141, v. pl. 8. figs. 23-30, common in Algeria.

Marinula (an *Pedipes*?) *forestieri*, Montrouzier, Journ. Conch. p. 261, pl. 10. fig. 1; previously named *Pedipes forestieri* in the same journal, p. 41. From Art Island, New Caledonia.

Melampus tetricus, Morelet, Journ. Conch. p. 290, New South Wales.

Carychium. Also of this genus M. Bourguignat (Malac. Algér. iv. pp. 129-131) has enumerated the known species, which amount to ten recent and fifteen fossil ones, after those without eyes from the caves of Carniola (*Zospeum*) have been excluded. Two species are found in Algeria, viz. *C. minimum* (Müll.) and *C. tridentatum* (Risso, sp.).

Carychium boysianum, Benson, Ann. & Mag. Nat. Hist. 1864, xiii. p. 210, Agra.

Coilostele, g. n., Benson, Ann. & Mag. Nat. Hist. 1864, xiii. p. 136; the inner part of the whorls resorbed as in other *Auriculacea*; the characters given by the author are insufficient to distinguish this genus from, or to show its affinity to, the known genera of *Auriculidae*. *C. scalaris*, Benson, l. c., Bundelkund.

LIMNÆACEA.

Limnæus obliquus, Martens, Mal. Blatt. p. 116, pl. 3. figs. 9, 10. Lake Issyk-kul in Central Asia; allied to *L. ovatus*; very thick.

Physa. Seven species are enumerated and figured by Bourguignat, Malac. Algér. iv. pp. 169-178, from Algeria: viz., *acuta* (Drap.), pl. 10. figs. 34-36; *subopaca* (Lam.), f. 37; *contorta* (Mich.), figs. 38-40; *raymondiana* (Bourg. 1856), figs. 41, 42; *brocchi* (Ehrenberg), figs. 45, 46; *truncata* (Fér.), figs. 47-49; and *brondeli* (Bourg. 1856), figs. 43, 44.

Physa inflata, Adams and Angas, Proc. Zool. Soc. 1864, p. 39, Wakefield River, S. Australia.

Planorbis. M. Bourguignat, Malacol. Algér., distinguishes seventeen Algerian species:—

Group of *corneus*: *Pl. metidjensis* (Forbes), v. pl. 9. figs. 1-3; *Pl. dufouri* (Grælls) = *legatorum* (Rossm.) = *metidjensis* (Morelet, non Forbes), pl. 9. figs. 4-9; *Pl. aclopus* (Bourg. 1859), pl. 9. figs. 10-12; *Pl. euchelius*, Bourg. v. p. 150, pl. 9. figs. 13-16.

Group of *carinatus*: *Pl. complanatus*, L. (= *marginatus*, Drap., including as varieties *Pl. submarginatus*, Jan, et *Pl. marmoratus*, Mich.), figs. 17-26; and *Pl. subangulatus*, Phil., figs. 27-30.

Group of *vortex*: the two European *Pl. spirorbis* (L. sp., Müll.) and *Pl. rotundatus* (Poirét) = *leucostoma* (Millet, Rossm.), pl. 10. figs. 1-4 and 5-8.

Group of *albus*: *Pl. lævis* (Alder), pl. 10. figs. 18–21; *Pl. agraulus* (Bourg.) p. 159, pl. 10. figs. 22–25; *Pl. numidicus* (Bourg.), p. 160, pl. 10. figs. 26–29; *Pl. brondeli* (Raymond, Journ. Conch. 1853), p. 161, pl. 10. figs. 30–33.

Group of *imbricatus*: the two European species, *Pl. imbricatus* (Müll.) and *Pl. cristatus* (Dr.), pl. 10. figs. 9–13 and 14–17.

Group of *fontanus*: *Pl. euphæus* (Bourg.), v. p. 165, pl. 9. figs. 35–38; *Pl. diaphanellus* (Bourg.), p. 166, figs. 39–42; *Pl. raymondi* (Bourg.), p. 166, figs. 43–46.

Planorbis duceyrieri, *Pl. aucapitainianus*, and *Pl. maresianus* are new species found in a subfossil state only in the Sahara, on the road from El-Ouad to Ghadames, and described by Bourguignat, Moll. terr. et fluv. de la Sahara.

Planorbis billingsii, Lea, Proc. Acad. Nat. Sc. Philad. 1864, p. 111, from the Ottawa River, California; *Pl. newberryi*, Lea, ibid. p. 5, from California. — *Planorbis sinuosus*, Bonnet, Rev. Zool. no. 9, from New Mexico [= *glabratus*, Say?]. — *Planorbis schrummi*, Crosse, Journ. Conch. 1864, p. 153, pl. 7. fig. 2, from Guadeloupe.

Ancylus ceylanicus, Benson, Ann. & Mag. Nat. Hist. 1864, xiii. p. 139.

Ancylus ovalis and *A. borealis*, Morse, l. c. (p. 201), from Maine, U.S.

Brondelia drouetiana and *Brondelia gibbosa*, described by M. Bourguignat in 1853 and 1862, are figured in Malac. Algér. v. pl. 11. figs. 24–30 and 31–35. The genus *Brondelia* might, without inconvenience, be regarded as a subdivision of *Ancylus*, being only distinguished by a more minute apex which is bent towards the left.

Suborder THALASSOPHILA.

SIPHONARIIDÆ.

Siphonaria thersites, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiv. p. 425, from the Vancouver district.

Order PULMONATA OPERCULATA.

Dr. KEFERSTEIN proposes for this order the name of *Neurobranchia*, justly insisting upon the great differences which exist between the organization of these mollusks and that of the Pulmonata inoperculata, as was admitted by Cuvier. Bronn, Thierreich, pp. 1025 and 1061.

M. STABILE (Moll. terr. Piém. pp. 131–135) has systematically arranged the results obtained by Prof. Troschel in his researches on the teeth of the radula. The arrangement does not offer any new feature, with the exception of the new name of *Pseudorhipidiglossata*, which is proposed for the *Cyclostomacea* with an opercle of few whorls; this family, more properly named *Cyclostomacea* by Prof. Troschel, comprises the subfamilies *Licinea*, *Cyclostomea*, and *Cistulea* of Mr. Pfeiffer's monograph, first supplement.

Dr. E. VON MARTENS has published a paper, "Bemerkungen

über natürliche Gruppierung und geographische Verbreitung der gedeckelten Land-Schnecken." [Remarks on the natural arrangement and geographical distribution of the operculated Land-snails.] Pfeiff. Malacol. Blätt. 1864, pp. 131-144:

The *Cyclostomacea* form, with regard to their facies and their geographical distribution, two divisions: those with a round operculum of many whorls, most abundant in Eastern Asia and the adjoining archipelagos, some occurring also in Tropical America, but entirely absent on the continent of Africa and in Europe; and those with ovate operculum of few whorls, inhabiting Eastern Africa and the adjoining islands, Europe, Western Asia, and likewise very abundant in the West Indies, but represented by a few aberrant forms only (*Realia* and *Omphalotropis*) in Eastern Asia*, Australia, and the islands of the Pacific.

Helicina, like the first division, inhabits Eastern Asia and Tropical America; but these two regions are in some measure connected by the frequent occurrence of this genus in the Pacific islands. The operculated land-snails found beyond the tropics are few in number, and belong to very different genera in the different regions: *Cyclostoma*, *Pomatias*, and *Acicula* in Europe; *Cyclotus*, *Cyclophorus* [and *Helicina*] in Asia; *Helicina* in America. From Western Africa, the continent of Australia south of the tropics, and from the same portion of America no operculated land-snail is known up to the present time†.

The genus *Otopoma* might better be cancelled and its species distributed between *Cyclostoma*, *Cyclotus*, and others. *Hydrocena* is quite distinct from *Omphalotropis*; but the latter is scarcely worthy of distinction from *Realia*. Many of the species enumerated as *Omphalotropis* are *Assimineæ*.

CYCLOSTOMACEA.

New genera proposed by Blanford, Ann. & Mag. Nat. Hist. 1864, xiii. :—

Cyclotopsis, g. n., p. 447; type *Cyclotus semistriatus* (Sowerby, Pfr.). We cannot agree with the author, who places it in the *Cyclostomideæ* proper, that is, the *Cyclostomacea* with an operculum of few whorls.

Lagocheilus (Theobald, MS.), p. 452, a new subgenus for *Cyclophorus scissimargo* (Bens.).

Craspedotropis, p. 454, subgeneric name for some species of *Cyclophorus*, as *C. involvulus* (Müller) and others.

Leptopoma is regarded as a subgenus of *Cyclophorus*.

Opisthoporus is subordinated to *Spiraculum* as a subgenus.

Cyathopoma, g. n., p. 449; type *Cyclotus filocinctus* (Bens.).

Jerdonia, g. n., proposed in Journ. As. Soc. Beng. 1861, is now fully characterized, p. 448; type *J. trochlea*.

Cyclotus. The species arranged in natural groups by the Recorder in

* A true *Otopoma* and a *Pomatias* lately discovered by Mr. Theobald in Transgangetic India, would appear to form exceptions to the general rule established in our paper, but they cannot overthrow it, the contrast between Western and Eastern Asia remaining very striking.

† Mr. Cox mentions two species of *Cyclophorus* from S. W. Australia.

Malac. Blatt. p. 141. The American species appear to be distinguished by the sharp edge of their operculum from those of India and the Eastern islands, and may form a distinct subgenus with the name *Aperostoma* (Troschel).

Cyclotus bisinuatus, Martens, Mal. Blatt. 1864, p. 113, pl. 3. figs. 1, 2, from Costa Rica; distinguished by two notches in the peristome.—*Cyclotus trinitensis* and *C. rugatus*, Lechmere Guppy, Ann. & Mag. Nat. Hist. xiv. pp. 245 and 246, from Trinidad.

Cyclotus fasciatus, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 117, from Celebes; *C. reticulatus*, Martens, l. c., from Timor and Flores; *C. succinctus*, Martens, l. c., from Timor; *C. ptychorhaphe*, Martens, l. c., from Western Borneo; *C. liratus*, Martens, l. c., from Amboina; *C. bicarinatus*, Martens, l. c. p. 118, from Ceram; *C. carinulatus*, Martens, l. c., from Booroo.

Cyclotus latistrigus, Martens, l. c. p. 116, from Western Borneo [is an *Opisthoporus*].

Opisthoporus sumatranus, Martens, l. c. p. 116. Sumatra.

Pterocyclos sumatranus, Martens, l. c. p. 116. Sumatra.

Cyclophorus. The Indian species arranged in natural groups by Blanford, Ann. & Mag. Nat. Hist. 1864, xiii. pp. 452–454, and by the Recorder in Malac. Blatt. 1864, p. 139.

Cyclophorus arthriticus, Theobald, Journ. As. Soc. Beng. p. 246, Pegu.—*Cyclophorus debeauxi*, Crosse, Journ. Conch. 1864, pp. 42 and 321, pl. 12. fig. 1, from Singapore [= *aquila*, Sow. ?].

Cyclostoma biangulatum, Pease, Proc. Zool. Soc. 1864, p. 674, Sandwich Islands? [*Cyclophorus*? allied to *C. obligatus*, Gould.]

Leptopoma dohrni, Adams and Angas, Proc. Zool. Soc. 1864, p. 38. New Ireland.

Alycaeus. The known species arranged into natural groups by Blanford, Ann. & Mag. Nat. Hist. 1864, xiii. pp. 457–459.

Alycaeus longituba, Martens, Monatsb. Ac. Wiss. Berl. 1864, p. 120. Sumatra.

Rhaphaulus ceramicus, Martens, ibid. p. 118. Ceram.

Pupinella macgillivrayi and *P. whartoni*, Cox, Catal. Austral. Land-shells, p. 32, and Ann. & Mag. Nat. Hist. xiv. p. 184. Port Denison, Queensland.

Pupina blanfordi, Theobald, Journ. As. Soc. Beng. p. 247, Pegu; *Pupina difficilis*, Semper, Proc. Zool. Soc. 1864, p. 252, Palaos Islands, Philippines; *Pupina wilcoxi*, Cox, Catal. Austral. Land-shells, p. 32, and Ann. & Mag. Nat. Hist. xiv. p. 183, Clarence River; *Pupina cori*, Morelet, Journ. Conch. p. 289, Port Curtis, Australia (sub lente confertim striatula).

Rhegistoma. Dr. von Martens, in a paper entitled "*Helix problematica* der Jugendzustand von *Rhegistoma*," and published in Malac. Blatt. 1864, p. 109, has shown that the young shell of *Rhegistoma* (*grande* and *fuscum*) differs much from the adult in having a flattened form and open umbilicus, and in not having the peculiar glossy appearance of the adult, and that it has been described as *Helix problematica*. The supposition that the one is merely the young state of the other has been confirmed by opening several adult shells. Also Dr. Pfeiffer has convinced himself of the truth of this observation.

Rhegistoma ambiguum, Semper, Proc. Zool. Soc. 1864, p. 251, from Luzon.

Licina? *percrassa*, Pfeiffer, Mal. Blätt. p. 157, Cuba. The author adds a short review of the present state of our knowledge of the genus *Licina*.

Cyclostoma (*Choanopoma*) *wrighti*, Pfeiffer, Mal. Blätt. p. 102, from Cuba, allied to *Ch. hystriz*.

Choanopoma troscheli, Pfeiffer, ibid. p. 103, from Cuba.

Ctenopoma pulverulentum, Wright, Mal. Blätt. p. 103, from Cuba.

Ctenopoma? *bufo*, Pfeiffer, ibid. p. 104, from Cuba.

Adamsiella aripensis, Lechmere Guppy, Ann. & Mag. Nat. Hist. 1864, xiv. p. 246, from Trinidad.

Ottopoma hinduorum, Blanford, Ann. & Mag. Nat. Hist. 1864, xiii. p. 464, from Kattiwur, Western India.

Cyclostomus römeri and *C. heynemanni*, Pfeiffer, Mal. Blätt. p. 105, from Cuba.

Cistula jimenoi (Arango), Pfeiffer, Mal. Blätt. p. 160, from Cuba.

Pomatias. Catalogue des espèces appartenant au genre *Pomatias*, et description d'une espèce nouvelle, par M. H. CROSSE. Journ. Conch. pp. 23-33.

Twenty recent and two fossil species, the following being added to the fifteen species enumerated in Pfeiffer's Supplement (1858): *P. dalmatinus* (Pfr. 1863), *excisus* (Mouss.), from Janina; *hidalgovi*, sp. n., p. 24, pl. 2. fig. 3, from Biscay; *himalayæ* (Bens.), and *rayanus* (Bourg.) from North-western France. The range of the genus is now extended from the Himalayas through Southern and Central Europe to the Canary Islands.

Pomatias turritus, Walderdorff, Verh. Zool. Bot. Ges. Wien, 1864, p. 511, from Southern Dalmatia and Montenegro.—*Pomatias sabaudinus*, Bourguignat, Mal. d'Aix, p. 64, pl. 2. figs. 11-14, from Savoy.

Pomatias aprieus, Mouss. sp. (= *carthusianus*, Dupuy) and *P. septemspiralis*, Ratzumowsky (= *maculatus*, Drap. sp.) are figured by Bourguignat, Mal. de la Grande Chartreuse, pl. 8. figs. 13-20, and Mal. d'Aix-les-Bains, pl. 2. figs. 15-22 (same figures).

Pomatias peguense, Theobald, Journ. As. Soc. Beng. 1864, p. 248, from Pegu.

Realia and *Omphalotropis*. On the affinity of these two genera and their difference from the true *Hydrocena* see Martens, Malak. Blätt. pp. 142-144. The name *Hydrocena* belongs originally to a Dalmatian species, named by Pfeiffer *cattarcensis*, which, by the callous basis of the shell, the Neritina-like process of its opercle, and the Trochoid structure of its radula is widely separated from *Cyclostoma* and much nearer to *Helicina*; but the shells from the Eastern and Pacific archipelagos, also named *Hydrocena*, do not belong to this genus, but either to *Realia* and *Omphalotropis*, or to *Assiminea*.

Realia producta and *R. abbreviata*, Pease, Proc. Zool. Soc. 1864, pp. 673, 674, Sandwich Islands?

Omphalotropis bicarinata, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 118, from Amboina; allied to *O. rubens* (Q. & G.).

Hydrocena nitida and *H. ovata*, Pease, Proc. Zool. Soc. 1864, p. 674, Sandwich Islands? [*Assimineæ*, H. Adams.]

DIPLOMMATINACEA.

Diplommatina constricta, Martens, Monatsb. Akad. Wiss. Berl. 1864, p. 119, from Ternate, is the type of a new subgenus, *Dianeta*, the whorl before the last being constricted.

Pazillus rubicundus, Martens, *l. c.* p. 119, from Borneo.

TRUNCATELLACEA.

Acme, Hartm. (*Pupula* Agassiz, *Acicula* Pfr.). M. Bourguignat distinguishes seven European and two Algerian species, three of which are described for the first time in Malac. Algér. v.: viz., *Acme benoiti*, p. 218, from Sicily; *A. lallemanti*, p. 220, from Algeria; and *A. letourneuxi*, p. 221, from Algeria.

Truncatella scalaroides, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 119, from Amboina.

Blanfordia, g. n., near *Tomichia*, with two species, *B. japonica* and *B. ben-soni*, both from Japan. A. Adams, Ann. & Mag. Nat. Hist. xii. p. 404, pl. 7.

HELICINACEA.

Helicina sculpta, Martens, Monatsb. Acad. Wiss. Berl. 1864, p. 120, from Timor; *H. suturalis*, Martens, *l. c.*, from Amboina and Ceram; *H. borneensis*, Martens, *l. c.*, from Western Borneo.

Helicina gladstonensis, Cox, Catal. Austr. Shells, p. 34, and Ann. & Mag. Nat. Hist. 1864, xiv. p. 184, from Gladstone, near Port Curtis, Queensland.

Helicina solida, and *H. corrugata*, Pease, Proc. Zool. Soc. 1864, p. 673, Sandwich Islands?

Helicina alboriridis, Wright, Mal. Blätt. p. 108, from Cuba; *H. montana*, Wright, *ibid.* p. 160, from Cuba; *H. granulum*, Gundlach, *ibid.* p. 161, from Cuba.

Helicina zonata * and *H. barbata*, Lechmere Guppy, Ann. & Mag. Nat. Hist. 1864, xiv. p. 247, from Trinidad.

Georissa, g. n., Blanford, Ann. & Mag. Nat. Hist. 1864, xiii. p. 463; is the type of a distinct subfamily *Georissinæ*.—*G. pyxis*, Blanford, *l. c.* India.

Class CONCHIFERA.

Order INCLUSA, Cuv. (*Pholadacea*, Adams.)

ANATINIDÆ.

Periploma angasi, Crosse et Fischer, Journ. Conch. 1864, p. 349, S. Australia.

Asthenothærus, g. n., Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 311; near *Thracia*.—*A. villosior*, Carpenter, *l. c.*, Cape St. Lucas, California.

Eucharis reclusi, *Eu. gouldi*, and *Eu. stimpsoni*, A. Adams, Ann. Mag. Nat. Hist. 1864, xiii. pp. 309 & 310, from Japan.

* This specific name is already twice preoccupied in the same genus.

Neæra. On the species of *Neæra* found in the seas of Japan. By A. ADAMS. Ann. & Mag. Nat. Hist. 1864, xiii. pp. 206-209. —The species of this genus are referred to seven generic divisions.

1. *Neæra* proper, with *N. elegans*, Hinds=*malaccana*, Adams and Reeve, and three new species from Japan, *N. nobilis*, *N. hindsiana*, and *N. nasuta* (p. 207).

2. *Rhinomya*, g. n., with *Neæra philippinensis*, Hinds, and *N. rugata*, sp. n., p. 207, from Japan.

3. *Cardiomya*, g. n., with *Neæra gouldiana*, Hinds.

4. *Leptomya*, g. n., with *N. cochlearis*, Hinds, and *Scrobicularia adunca*, Gould.

5. *Leiomya*, g. n., with *N. adunca*, Gould.

6. *Theora*, with *N. iridescens*, Hinds, *fragilis*, Ad., and *nitida*, Gould.

7. *Endopleura*, g. n., with *Theora lubrica*, Gould.

Pandora. Contributions towards a monograph of the Pandoridæ. By P. P. CARPENTER. Proc. Zool. Soc. 1864, pp. 596-603. The author has recognized four generic types:—

1. *Clidiophora*, g. n., with internal linear process as in *Anatina* (named *clavicle* by the author) and with ossicle in the hinge; the most highly organized forms of the family. North American. Contains *Pandora claviculata* (Carpenter), *tabacea* (Meuschen), *trilineata* (Say), *nasuta* (Sow.), *punctata* (Conrad), *depressa* (Sow.), *cornuta* (C. B. Adams) (which name, because "calculated to mislead," is changed by the author into *acutedentata*), and perhaps also *P. discors* and *arcuata* (Sow.); and finally *Clidiophora cristata*, sp. n., p. 597, from the Gulf of California.

2. *Cælodon*, g. n., without clavicle and ossicle, but possessing a tent-shaped dentition in the left valve. East Indian. *Pandora ceylanica* (Sow.), *cumingii* (Hanley), *delicata* (A. Adams), *flexuosa* (Sow.), perhaps *unguiculus* (Sow.), and finally *Cælodon elongatus*, sp. n., p. 600, from China and Borneo.

3. *Pandora* (Lam.) is to be limited to the species without clavicle, tent, or ossicle, as the typical *rostrata* (Lam.), *obtusa* (Lam.), *brevifrons* (Sow.), *cistula* (Gould), *oblonga* (Sow.), *radiata* (Sow.), and *wardiana* (A. Adams).

4. *Kennerlia*, g. n., with ossicle, without clavicle. North Pacific and Arctic Oceans. Connects *Pandora* and *Myodora*. Named in honour of Dr. Kennerley, the late naturalist to the American North Pacific Boundary Survey. *Pandora glacialis* (Sow.) and two new species: *Kennerlia filosa*, p. 602, from Puget Sound, and *K. bicarinata*, p. 602, from Catalina Island, California.

Order CARDIACEA, Cuv. (*Veneracea*, Adams.)

MACTRIDÆ.

Mactra lüdorfii, Dunker, Mal. Blätt. p. 99, from Jesso in Japan; *Mactra amygdala*, Crosse et Fischer, Journ. Conch. p. 349, from S. Australia; *Mactra (Mulinia) pinguis*, Crosse et Fischer, l. c., from S. Australia. 1864. [VOL. I.]

TELLINIDÆ.

Psammobia weinkauffi, Crosse, Journ. Conch. p. 17, pl. 2. fig. 4, from Algeria.—*Psammobia regularis*, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 312, from Cape St. Lucas, California.

Tellina (Peronæoderma) ochracea, Carpenter, l. c. p. 311, Cape St. Lucas, California.

Angulus variegatus, Carpenter, l. c. xiv. p. 423, from Monterey.

Maera salmonea, Carpenter, l. c. p. 423, from San Francisco, resembling *Macoma crassula* (Desh.).

Donax saigonensis, Crosse et Fischer, Journ. Conch. p. 323, pl. 13. f. 7, from Saigon, CochinChina.

Iacra, g. n., H. et A. Adams, Ann. & Mag. Nat. Hist. 1864, xiii. p. 308. *I. japonica*, H. et A. Adams, from Japan.

Mesodesma obtusa, Crosse et Fischer, Journ. Conch. p. 350, from S. Australia.

VENERIDÆ.

Dr. ED. RÖMER*, who has occupied himself for many years with the special study of this family, published a paper in Pfeiffer's Malak. Blätt., entitled "Beschreibung neuer Arten von Venus" (Descriptions of new species of Venus), pp. 119–123; and a second, "Kritische Uebersicht sämmtlicher zur Gattung Venus gehörenden Arten des Subgenus *Katelysia*" (a critical synopsis of all the species of the genus *Venus* belonging to the subgenus *Katelysia*), pp. 169–176.

Ten species, among which are *Venus aphrodina* (Lam.) = *peronii* (Lam.), *V. exalbida* (Chemn.), and *V. astartoides* (Phil.). The subgenus was established by the author in a former publication, as early as 1857. H. and A. Adams placed these species with *V. gallina* (L.) in their subgenus *Chamelea*.

Mr. Reeve has figured the following species of *Venus* in Conch. Icon. As most of them are without description or illustration of the hinge or pallial impression, it would be hazardous to offer any opinion as to their natural affinities:—

Venus cuneiformis, 120, hab. — ?, approaching *V. aphrodina* (Lam.); *V. tasmanica*, 121, Tasmania, type of *V. mitis* (Desh.); *V. sallei*, 124, Bird's Island, Caribbean Sea; *V. irregularis*, 134, mouth of the Gaboon; *V. layardi*, 136, Ceylon, type of *V. mitis* (Desh.); *V. cerina* (C. B. Adams MS.) 140, hab. — ?; *V. globulus*, 141, hab. — ?

Callista accincta, Römer, Mal. Blätt. p. 121, from the Philippines.

Callista pollicaris, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 312, Cape St. Lucas, California (= *prora*, teste Reeve l. c. p. 340).—*Callista puella* (? *pannosa*, var.), Carpenter, l. c., from Cape St. Lucas.

* We may mention that Dr. Römer published a monograph of the genus *Dosinia* (*Artemis*), with very fine illustrations, in 1862; and is now engaged in the publication of a similar one of *Venus*, two parts of which have been issued now (May 1865), by Th. Fischer, in Cassel.

Tivela cora and *T. dunkeri*, Römer, in Pfr. Mal. Blätt. pp. 119 & 120; locality unknown.

Tivela (Trigona) subglobosa, Dunker, in Pfr. Mal. Blätt. p. 100; locality unknown.—*Tivela (Trigona) natalensis*, Dunker, l. c. p. 101; Natal.

Lioconcha sphragitis, Römer, Mal. Blätt. p. 122; Indian Ocean.

Tapes. Kritische Uebersicht sämmtlicher Arten der zur Gattung *Venus* gehörenden Untergattung *Tapes*, von E. RÖMER. [A critical synopsis of all the species belonging to *Tapes*, a subgenus of the genus *Venus*.] Pfr. Mal. Blätt. pp. 19–44, 58–98.

The author enumerates all the species known to him, carefully compiling the synonymy and adding critical and descriptive remarks to almost every species. He admits three sections in this division:—

1. *Textrix*, with the type *T. textrix* (Chemn.).

2. *Parembola*: *a*, testa sulcata, *T. literata* (L.); *b*, testa transversim corrugata vel laminosa, *T. obsoleta* (Chemn.).

3. *Amygdala*; *T. decussata* (L.).

4. *Hemitapes*: *a*, testa transversim sulcata, *T. virginea* (L.)=*rimularis* (Lam.); *b*, testa lævis, *T. pinguis* (Chemn.).

For the European *Venus virginea* of authors (not L.) the specific name of *edulis* (Chemnitz) is chosen.

Tapes (Hemitapes) apaturia, Römer, Mal. Blätt. p. 123, from the Philippines; allied to (*Chione*) *ustulata* (Desh.).

Mr. Reeve, Conch. Icon., has published the following species:

Tapes orientalis, 34; Bombay.—*T. occidentalis*, 35; Guadaloupe.—*T. bicolorata*, 42; hab. —?—*T. livida*, 47; hab. —?—*T. vernicosa*, 48; hab. —?—*T. amphidesmoides*, 50; Red Sea.—*T. ferruginea*, 51; Philippines.—*T. arctica*, 52; "Arctic Sea."—*T. faba*, 39; hab. —?.

CYRENIDÆ.

Cyrena quilonica (Bens. 1860) has been identified with *C. cochinchensis* (Hanley, 1858) by Mr. Benson himself. Ann. & Mag. Nat. Hist. xiii. p. 496.

Corbicula angasi, Prime, Journ. Conch. p. 151, pl. 7. fig. 6; Murray River, Australia.

Cyclas asiatica, Martens, in Zeitschrift der deutschen geologischen Gesellschaft, 1864, p. 349, with figs.; fossil in Siberia, and probably living in Kamtschatka;=*C. calyculata compressa* (Middendorff).

CARDIIDÆ.

Lævicardium apicinum, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 309; Cape St. Lucas, California.

Bucardia (Meiocardia) cumingii, A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 309; China Seas.

Callocardia, g. n., A. Adams, l. c. p. 307, near *Isocardia* (Lam.); *C. guttata*, A. Adams, l. c., Island of Quelpart, near Korea.

Order MYTILACEA, Cuv. (*Lucinacea*, Ad.)

LUCINIDÆ.

Lucina lingualis, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 313, Cape St. Lucas, California.

LASEIDÆ.

Thecodonta, g. n., A. Adams, Ann. & Mag. Nat. Hist. xiii. p. 308, near *Goodalliopsis*; *Th. sieboldi*, A. Adams, l. c., from the Gotto Islands, Sea of Japan.

SOLEMYIDÆ.

Solemya mediterranea (Lam.) found in Corunna Bay, hitherto not known from beyond the Mediterranean. M'Andrew, Ann. & Mag. Nat. Hist. xiv. p. 232.

Solemya valvulus, Carpenter, Ann. & Mag. Nat. Hist. xiii. p. 311, from Cape St. Lucas, California.

ASTARTIDÆ.

Miodon, a new subgenus, intermediate between *Venericardia*, *Astarte*, and *Lucina*, Carpenter, Ann. & Mag. Nat. Hist. xiv. p. 424; *M. prolongatus*, l. c., from the Vancouver district.—To this (sub)genus belong *Astarte orbicularis* (Sow., Min. Conch.) and *A. corbis* (S. Wood, Crag Moll.).

Thecalia macrotheca, Adams and Angas, Proc. Zool. Soc. 1864, p. 39, from Rapid Bay, S. Australia.

UNIONIDÆ.

Unio nanus (Dupuy) and *U. amnicus* (Retz.) are figured from Savoy specimens by Bourguignat, Mal. d'Aix, pl. 3.

M. Bourguignat has figured the following species in Malac. Algér. v.:—

Unio rhomboideus (Moq.-Tand.) (*litoralis*, Lam.), pl. 18. figs. 1–10, and pl. 19. figs. 1–3; *U. durieui* (Desh.), pl. 19. figs. 4–8; *U. batavus* (Lam., Nilss.), pl. 19. figs. 9–11, and pl. 20. figs. 1–4; *U. ravoisieri* (Desh.), pl. 20. figs. 5–10; *U. moreleti* (Desh.), pl. 21, and pl. 22. figs. 1–5; *U. pictorum* ("Philippson"), pl. 22. figs. 6–11.

Mr. J. Lea has characterized the following new species in Proc. Acad. Nat. Sc. Philad. 1864, pp. 285 and 286: *Unio homsensis* and *U. emesaensis*, from the River Orontes; *U. kullethensis*, *U. orphaensis*, and *U. mardinensis*, from the Tigris or its tributaries.

Unio megapterus, Morelet, Journ. Conch. p. 159; *U. mandarinus*, Morelet, l. c.; and *U. massini*, Morelet, l. c. p. 289; all three from Cochinchina.

Mr. Reeve, Conch. Icon., has figured six species which, with the exception of the first (which is from Mexico), are "North American." It is possible that several of the names designated by Mr. Reeve as manuscript names have been published elsewhere, so that such species would not be new for the year 1864. The species are the following: *Unio corium*, Reeve, 39, allied to *U. pliciferus* (Lea); *U. deviatu*s (Anthony, MS.), 61; *U. sacculus* (Anthony, MS.), 67; *U. nucleopsis* (Conrad, MS.), 68; *U. mundus* (Lea, MS.), 72; *U. subrostratus* (Say, MS.), 78.

Unio (Alasmodon) evansi, Adams and Angas, Proc. Zool. Soc. 1864, p. 39, from Lagoon of the Lower Murray River.

Monocondylea mardinensis, Lea, Proc. Acad. Nat. Sc. Philad. 1864, p. 286, from the River Mardin, a tributary of the Tigris.

Anodonta. M. Bourguignat, Malac. Algér. v., has figured the following species: *A. lucasi* (Desh.), pl. 23 (typ. specimen), and pl. 24. fig. 1 (var.); *A. numidica* (Bourg.), pl. 24. figs. 2-6; *A. embia* (Bourg.), pl. 25, and pl. 26. fig. 1; *A. letourneuxi* (Bourg.), pl. 26. figs. 2-6.

Anodonta tunizana, Morelet, Journ. Conch. 1864, p. 156, from Calle in Algeria.

MYTILIDÆ.

Crenella inflata, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 313, from Cape St. Lucas, California.

Adula (Adams), subgenus of *Modiola*, characterized by Carpenter, *ibid.* xiv. p. 424; *A. stylina*, Carpenter, *l. c.*, from Monterey, &c.

DREISSENIDÆ.

Dreissena polymorpha. On its migration, see p. 191.

AVICULIDÆ.

MEEK, F. B. Remarks on the family *Pteriidae* = *Aviculidae*, with descriptions of some new fossil genera. Sillim. Amer. Journ. Sci. and Arts, 1864, vol. xxxvii. p. 212.

Although this memoir treats on fossil shells, we may mention it here, as the following new arrangement refers to recent as well as to fossil genera:—

- a. *Pteriniinae* or *Pterinia*-group, without recent representative.
- b. *Pteriinae* or *Aviculinae*: *Pteria* (Scopoli, 1779) = *Avicula* (Brug. 1789), *Margaritifera*, Malleus.
- c. *Melininae*: *Crenatula*, *Melina* = *Perna* (Brug.).

As regards *Pinna*, the author is inclined to form for it a separate family, which would include, besides *Pinna*, *Atrina* and the fossil *Trichites*.

Bryophila, g. n., Carpenter, Ann. & Mag. Nat. Hist. 1864, xiii. p. 314, "like a minute *Pinna*, or a transverse *Margaritophora*," viviparous.—*B. setosa*, Carpenter, *l. c.*, from Cape St. Lucas, California.

Order OSTRACEA, Cuv. (*Pectinacea*, Ad.)

ARCIDÆ.

Axinaea (? *septentrionalis*, var.) *subobsoleta*, Carpenter, Ann. & Mag. Nat. Hist. 1864, xiv. p. 425, from the Vancouver district.

Nucula hartvigiana, Dohrn, in Pfr. Mal. Blatt. 1864, p. 57, from New Zealand; allied to *N. pisum*.

PECTINIDÆ.

Pecten multisquamatus, Dunker, in Pfr. Mal. Blatt. 1864, p. 100, from Cuba.

Class BRACHIOPODA.

DESLONGCHAMPS, EUDES. Recherches sur l'organisation du manteau chez les Brachiopodes articulés, et principalement sur les spicules calcaires contenus dans son intérieur. Caen, 1864. 4to, pp. 36, with 3 plates.

The mantle of the Brachiopods has not only the function of a matrix of the shell, but also participates in the functions of respiration, circulation, and even generation; it is composed of two laminæ, the one being attached to the shell and apophyses, whilst the other adheres to the former and forms a coat for the arms. The two lobes of the mantle, which correspond to the valves of the shell, are united at the base of the peduncle only, where they form the visceral cavity.

Calcareous spicula are found in the larger blood-vessels of most genera, and their form and size are characteristic for each genus. They are most developed in *Thecidium*; in *Kraussina* they retain, during the whole life of the animal, the same form which we observe in young individuals of the other genera. They are absent in *Lingula* and *Rhynchonella*, and they are replaced by an amorphous calcareous substance deposited in the mantle in *Terebratella* and *Waldheimia*.

F. *Palæontology of Recent Species.*

We intend to notice briefly under this head some facts concerning certain fossil species which are regarded as identical with living shells, but which are not now found in the regions formerly inhabited by them. Thus, for instance, *Cyclostoma elegans* has been found in Jütland in a subfossil state (Mörch, Syn. Moll. Dan. p. 57), and the nearest locality where it is known to live is Cassel in Germany. Another example is *Cyrena* (*Corbicula*) *fluminalis* (Müll. sp.), found on the banks of the Irtysh, near Omsk in Siberia, with other apparently fossil shells, and described by the Recorder in the 'Zeitschrift der deutschen geologischen Gesellschaft in Berlin,' 1864, p. 348 (with figure); the nearest locality of the living shell is the southern shore of the Caspian Sea.

ANGELIN, N. P. Subfossile snäckar i Skane. Öfvers. Vet. Akad. Förhandl. (1863) Stockh. 1864, p. 345.

[Subfossil shells in Scania, a province in Sweden.]

Litorina litorea and *Cardium edule* are found inland, at a distance of about one-fourth of a Swedish mile from the sea.

G. *Nomenclature.*

At the conclusion of our Record we have to mention some publications in which the authors protest against abuses of the

law of priority, by which the generic part of conchological nomenclature has been brought into great confusion; we refer to the protests made by *Dr. Keferstein* in 'Bronn's Thierreich,' p. 1029, by the *Recorder* in *Malak. Blätt.* p. 166, and by *Mr. P. P. Carpenter* in *Ann. & Mag. Nat. Hist.* xiv. p. 155.

The law of priority has been established in Zoology in order to prevent unnecessary innovations and changes in nomenclature and to give this a certain stability, but not to overthrow names familiar to every zoologist and consecrated by the use of half a century, in favour of others proposed perhaps only a few years previously to their establishment by some obscure writer for artificial combinations which often scarcely correspond in extent, and never in definition, with the modern genus. It is true that most of the Linnean genera are open to the same objection, but they continued in general use by the later scientific naturalists, who restricted them gradually. The establishment of genera in the present sense of the word—with equal regard to the characters of the shell and to those of the soft parts of the animal—commences in Conchology with *Draparnaud* and *Lamarck*. Even *Linné* and *O. Fr. Müller* did not hesitate to unite in the same genus, by a single artificial character, species which they *knew* to be different in all other respects. Therefore in this branch of Zoology it would be preferable not to extend the right of priority, in respect of generic names, to the writings of authors antecedent to *Draparnaud* and *Lamarck*. But if, for the sake of uniformity with other branches of Zoology, this boundary should appear to be too narrow, even the keenest partisan of the principle of priority ought not to carry it further back than 1758, the year in which the tenth edition of *Linné's 'Systema Naturæ'* was published. Yet we find in several recent conchological works generic names chosen on account of their priority, and taken from the writings of *Browne*, *Plancus*, or *Columna*! Why, then, we should not also respect names used by *Aldrovandi* and *Pliny*, we are at a loss to conceive.

Neither the system of *Linné* nor that of *Lamarck* came into the world as something absolutely new; each was preceded by more or less similar attempts. It is important for the history of our science that we should examine and acknowledge these preparatory labours, but it is not for the interest of science that we should recognize them in our nomenclature, which, as *Mr. Carpenter* justly observes, has already been brought into a most unsettled condition by the attempts made to do so. We will mention a few cases out of many, showing the confusion caused by the introduction of these old names. *Cyclostoma*, *Delphinula*, and *Oliva* were generic names familiar to, and acknowledged by, every conchologist before 1847. Now, *Dr. Gray* having found that the name *Cyclostoma* was originally intended for *Delphinula*, substituted it for the latter, changing *Oliva* into *Strephona*

(Browne). On the other hand, Messrs. Adams substitute *Angaria* (Bolten) for *Delphinula*, and *Dactylus* (Klein) for *Oliua*, proposing the latter name for another entirely different genus, viz. *Cylichna* (Lovén). Perfectly ridiculous mistakes even have arisen from the zeal for discovering old generic denominations: Chemnitz, following Linné's classification in the later portion of his 'Conchylien-Kabinet,' adopts the Linnean genus *Solen* in its original extent; but not having fixed rules for the denomination of species, he calls one (*Solen*) *legumen* (as in the 'Systema Naturæ'), and another *Leguminum maximum*, which, as everybody knows, means *the largest of the legumens*. But Messrs. Adams quote "*Leguminum*, Chemnitz," as a synonymous generic name! Rumph narrates that in his time the Amboynese used a Psammobia-like shell-fish in the preparation of a highly prized sauce which he compares with the *garum* of the Romans, naming the shell *Tellina gari*, the *Tellina* of the sauce. The description and figure given by Rumph are not exact enough to admit of a direct identification of the species; but as *Psammotæa violacea* (Lam.) is the only species which is sold in abundance in the markets of Amboyna, and to which Rumph's account can be applied, we think that this is the *Tellina gari*. Linné adopted this name, but applied it to other similar species. Schumacher, regarding *Tellina gari* of Linné as the type of a distinct genus, designated it with the genitive case *Gari*. And, finally, we find in the work of Messrs. Adams (ii. p. 390) *Gari gari* as the only admissible name of a shell which is not the sauce-shell of Rumph!—Poli adopted the nomenclature of Linné in the body of his work, but in the introduction he gives a classification of Bivalves founded upon the characters of the soft parts of the animals. The genera thus established did not correspond with the Linnean, which are based on the differences of the hinge; and therefore Poli introduced new names for them. Afterwards he expresses his opinion that the shell should be designated by a generic name somewhat different from that of the animal inhabiting it, namely by a compound of this name with — *derma* (skin); thus, for instance, the animals of the modern genus *Tellina* are called *Peronæa*, and the shells *Peronæoderma*, the oysters *Peloris*, and their shells *Peloriderma*. Now, Hr. Mörch and after him Messrs. Adams distinguish two subgenera of *Tellina*, calling the one *Peronæa* (Poli) the other *Peronæoderma*. *Peronæa* contains one of the species described by Poli as *Tellina*, and mentioned as an example for his *Peronæa* as well as for his *Peronæoderma*; *Peronæoderma*, Mörch, does not contain a species described by Poli. So well understood are the works of the authors whose rights the champions of the law of priority feel bound to reestablish!

It appears to be self-evident that neither generic names which are used in manuscripts or collections only (like those of Leach),

nor those published without any description, and intelligible from the quotation of a figure only (like those of Bolten), can have any claim to priority.

The fancy of changing well-known and generally adopted *specific* names for others of sometimes a very dubious character is also not yet extinct. M. Bourguignat, in the papers quoted above, substitutes the almost unutterable name of *Helix isognomostoma* for the well-known *Helix personata* (Lam.), and *Anodonta arenaria* for *A. cellensis*: the first, because Gmelin confounded the German species with the American one under this name; and the second, because Schröter was unable to distinguish an *Anodonta* from *Mya arenaria*, L.!

The vague distinction made by some authors between *genera* and *subgenera* has been represented as another cause of the "unsettled state of our nomenclature." It is, without doubt, a sign of progress in our science to distribute numerous species of a genus in subdivisions called sections, groups, or subgenera by the different authors. Perhaps they might have been best designated by adjectival names derived, when possible, from the name of the typical species, like those used by palæontologists for the groups of Ammonites, Terebratulæ, &c. Thus, M. Crosse names a distinct subdivision of *Bulimus* "les *Bulimes auriculiformes*." But zoologists, after the example first given by Cuvier, generally give substantive names to these subgenera, which certainly has the advantage that no further change is necessary, if, as is frequently the case, the subgenus established by one author is regarded as a genus by another; but this practice has the disadvantage of leading to a rather rash and inconsiderate creation of new names: if the genus should not prove to be valid, it may be taken as a subgenus. In Mörch's revolutionary rather than reformatory lists of shells, it is quite impossible to find out which names are intended for genera and which for subgenera. Messrs. Adams now frequently use a name as a generic name which was proposed in their great work on the Genera of Mollusca as subgeneric only. Mr. Carpenter himself uses names of his new "subgenera" just as if they were generic. The late Dr. Albers and the Recorder have several times been severely blamed, especially in this year by M. Crosse in his excellent memoir on the "*Bulimes auriculiformes*," for having introduced new genera which, in reality, were understood and represented by us as subgenera only, as may be easily seen from the manner in which the species are enumerated.

Finally, also the distinction between *species* and *varieties* has been a matter of question this year. Mr. Carpenter ventured to describe some shells as new, acknowledging by the form of the name itself that he is quite undecided (or rather indifferent) whether they should be regarded as good species or as new varieties of species known (Ann. & Mag. Nat. Hist. xiii. pp. 311-

315, *passim*). Mr. Reeve protests against this unheard-of innovation, in the interest of a fixed nomenclature (*ibid.* p. 440); and Mr. Carpenter again replies in the most candid manner, viz. that, in many cases, we cannot with anything like scientific certainty decide whether a particular form is a species or a variety. Mr. Theobald, in a most interesting paper on Burmese Land-shells (*Journ. As. Soc. Beng.* 1864, pp. 238-250), extends the limits of the term "variety" considerably, uniting into one species numerous forms which previous authors had regarded as distinct. The tendency of the greater part of Conchologists to multiply the number of species on the slightest grounds, must necessarily lead to such a reaction, in which more regard is paid to the common than to the divergent characters of the species. It is certainly desirable that every local form, well marked geographically and zoologically, should have a distinct name; but whether we name them varieties or "good species" seems to be, in reality, a matter of minor importance.

MOLLUSCOIDA*

BY

J. REAY GREENE, B.A.

ALDER, J. Descriptions of new British *Polyzoa*, with remarks on some imperfectly known species. Quart. Journ. Micr. Sci. vol. iv. n. s., 1864 (pp. 95-109, with four plates). An abstract of this paper is given in Brit. Assoc. Rep.—1863.

MACDONALD, J. D. On the Representative Relationships of the Fixed and Free *Tunicata*, regarded as two subclasses of equivalent value; with some general remarks on their Morphology. Trans. Roy. Soc. Edinb. vol. xxiii. part 2 (pp. 171-183, with a plate).

MACDONALD, J. D. On the Morphological Relationships of the *Molluscoidea* and *Calenterata*, and of their leading members, inter se. Trans. Roy. Soc. Edinb. vol. xxiii. part 3 (pp. 515-521, with a woodcut).

NORMAN, A. M. On undescribed British *Hydrozoa*, *Actinozoa*, and *Polyzoa*. Ann. & Mag. Nat. Hist. vol. xiii. ser. 3, 1864, January (pp. 82-90, with three plates).

VALENCIENNES, A. Observations sur les animaux marins qui s'attachent aux vaisseaux. Compt. Rend. tome lix. No. 2, 1864 (pp. 61-64).

GRUBE, A. E. Die Insel Lussin und ihre Meeresfauna. Breslau, 1864, 8vo (pp. 50-68).

STIMPSON, W. Descriptions of new species of Marine *Invertebrata* from Puget Sound, collected by the naturalists of the North-west Boundary Commission, &c. Proc. Phil. Acad. No. 3, 1864 (pp. 153-161).

(Published in advance of the "Zoological Report of the Boundary Commission," in which drawings of the species will be given).

J. D. MACDONALD is of opinion that the *Molluscoidea* and *Calenterata* together form an unbroken series of animals, to be

* The literature of the *Brachiopoda* has been noticed in the Record on *Mollusca*, by Dr. von Martens.

placed between the *Mollusca* proper, on the one hand, and the *Protozoa*, on the other. The members of the group thus constituted, though developed from true ova, are prone to form compound organisms by continuous gemmation. In all, the movement of the circulatory fluid is effected either by ciliary action or by a propulsive organ unfurnished with valves.

This new arrangement mainly depends on its author's interpretation of certain structures of the *Ctenophora*, especially of *Cydippe*. The funnel and apical canals of this organism he regards as an intestine, not as parts of the general cavity of the body. He also considers it probable that the ciliated bands of *Cydippe* "represent the tentacula of the *Polyzoön* or of the *Brachiopod* having become retroverted and connate, as it were, with the body, as next in order of suppression." These structures are without corresponding organs among the *Cœlenterata* proper, which want, moreover, the nervous system common to the *Molluscoida* and *Ctenophora*. The aquiferous system of *Cydippe*, "like the pallial sinus system of the *Brachiopod*, is not only lined with cilia circulating a corpusculated fluid, but also contains the reproductive organs." So, likewise, the tentacular apparatus of the *Ctenophora* "may be regarded as pallial."

Accepting the conclusion that the branchial sac of the *Tunicata* is represented by the tentacles of the *Polyzoa* or the fringed arms of the *Brachiopoda*, our author assigns it a further homologue in the ciliated bands of the *Ctenophora*. Accordingly this class would belong rather to the *Molluscoid* than to the *Cœlenterate* division of the proposed series, while "the *Brachiopoda* and *Polyzoa* should be taken together as a group in themselves, quite as natural as the *Tunicata*, consisting of simple and compound forms." Comparing, therefore, the respiratory system in these three classes of the revised group of *Molluscoida*, it will be "pharyngeal in the first [*Tunicata* or *Ascidiozoa*], oral in the second [*Brachiopoda* and *Polyzoa*], and somatic in the last [*Ctenophora*]." The entire classification is summed up in the accompanying table—

Molluscoida (including the *Ctenophora*)—

Intestine insulated from the somatic cavity.	{ With primary hæmal and final neural flexure	{ Ascidiozoa.
	{ With simple neural flexure	{ Brachiopoda and Polyzoa.
Intestine straight, and communicating with the somatic cavity		{ Ctenophora.

Cœlenterata (excluding the *Ctenophora*)—

Intestine obliterated: stomach communicating with the somatic cavity	{ Actinozoa.
True stomach obliterated, its office being answered by the somatic cavity	{ Hydrozoa.

Thus, from the *Ctenophora* as a central group, we proceed in

two directions—towards the Molluscoid, or higher, and Cœlenterate, or lower, divisions of the series. Each of these, in its turn, includes a primary and a secondary type, the two secondary types, *Ascidiozoa* and *Hydrozoa*, being most remote from one another and the *Ctenophora*. The five classes are severally distinguished by characters drawn from their alimentary and tentacular systems. The principal variations in the former are ascribed to *modification*, those in the latter to *addition* of structures. These modifications and additions are either *progressive* or *retrogressive*, according as they affect the *Molluscoïda* or *Cœlenterata* proper.

TUNICATA.

The 'pelagic' *Tunicata*, according to J. D. Macdonald, constitute a subclass equivalent to the 'simple,' 'social,' and 'compound' forms of fixed *Tunicata* collectively, and of greater value than either of these groups taken separately. It must not be forgotten that the respiratory system, of peculiar import in the morphology of this class, appears in the pelagic division under four principal modifications, while two, at most*, can be recognized among the remaining *Tunicata*. Again, the pelagic genera, though much fewer in number, are sufficiently diversified to represent the three principal sections into which the fixed *Tunicata* are usually divided, as will appear from the annexed table—

TUNICATA.

<i>Pelagic.</i>		<i>Fixed.</i>	
Appendicularia	}	. . .	Simple
Doliolum . . .			
Salpa	}	. . .	Social
Pegœa			
Pyrosoma			Compound

The author further enlarges on the nature of the distinctions involved in this tripartite division of the class, and on the mutual relations of the zooids associated in the same colony among the social and compound forms. He adds an analytical table, in which all the genera of *Tunicata* are briefly defined, and arranged under groups with special reference to the characters just noticed. He has himself established six genera—*Peroides*, *Chondrostachys*, *Diplosoma*, *Polyclinoides*, *Pyrosomopsis*, and *Orthocœla*—three of

* Supposing *Chelyosoma* and *Pelonaia* to want the distinct branchial sac of the other fixed *Tunicata*. Macdonald here relies on the diagrammatic section of *Pelonaia* appended by Huxley to his paper in Phil. Trans. 1851. Better materials have since led Huxley to conclude that this section is erroneous, and that *Pelonaia* does not differ in any essential respect from *Cynthia*. The case of *Chelyosoma* is very doubtful.

which have been characterized in previous memoirs. These six genera, with other doubtful or interesting forms, are made the subject of remark in a series of supplementary comments. The paper concludes with anatomical descriptions, from the author's original notes, of the two new genera of Salpians.

Remarks on known genera :—

Cynthia, *Cesira*, *Molgula*. The two last may be "synonyms of one and the same genus," with which *Cynthia*, as defined by Fleming (with the character of 'Tentacula compound'), is probably identical. *Cynthia* proper, like *Ascidium*, has simple tentacles and a rudimentary liver.

Diazona. Is not this genus, resembling *Synthetys* in structure, "more closely related to the social than to the compound Tunicata" ?

Synaccium and *Sidnyum*. As it is not certain whether these genera have an intercommunicating palliovascular system, their place among the Botryllians remains doubtful.

New genera :—

Polyclinoides, Macdonald. Allied to *Botryllus*. *Ascidarium* thin, encrusting; abdomen distinct; genitalia pedunculate, forming a post-abdomen; branchial orifice conspicuously elevated, six-lobed; cloaca having its superior margin much reduced, with its extremity three-lobed (not simple, as in *Botryllus*). From *Polyclinum* the genus differs in its more strictly Botryllian habit and intercommunicating palliovascular system. Australia.

Pyrosomopsis, Macdonald. *Ascidarium* including seven zooids, arranged after the manner of those in the first-formed circle of *Pyrosoma*, "radiating, with their posterior extremities approximated near the centre, and enveloped in a common membrane, like a medusiform disc;" zooids resembling those of *Salpa*. Southern Seas.

Orthocala (= *Salpa pinnata*), Macdonald. Differs from *Salpa* in its "intestine extended directly forwards from a cæcum-like proventriculus. The anus, and with it the ejaculatory duct, opening near the branchial orifice." Various localities.

New species :—

GRUBE (pp. 50-66) describes thirty-two species of Tunicates from the shores of Lossini, of which four are new; figures of these are given :—

Phallusia fumigata, Gr.; *Didemnum variolosum*, Gr.; *D. gyrosus*, Gr.; *Botryllus baeri*, Gr.

A. STIMPSON describes five new Tunicates from Puget Sound.

Cynthia haustor, Stimpson; *C. gibbsii*, S.; *C. coriacea*, S.; *C. villosa*, S.; *Chelyosoma producta*, S.

A. VALENCIENNES, on the authority of Becquerel, states that a frigate, laid up for several months in the harbour of Toulon, had her wooden keel overgrown with countless masses of *Ascidia clavata*, Cuv.

POLYZOA.

The following *Polyzoa* were found by GRUBE at Lossini (pp. 66-68) :—

Salicornaria farciminoides (Johnst.); *Scrupocellaria scruposa* (V. Bened.); *S. scruposa* (Busk); *Bugula flabellata* (Busk); *B. plumosa* (Busk); *Lepralia pertusa* (Johnst.); *L. pallasiana* (Busk); *L. trispinosa* (Johnst. ?); *L. reticulata* (Johnst. ?); *Cellepora pumicosa* (L.); *Eschara foliacea* (Lam.); *E. fascialis* (Pall.); *E. cervicornis* (Lam.); *Retepora cellulosa* (Lamx.); *Myrizoon truncata* (Pall.); *Tubulipora patina* (Lam.); *T. verrucaria* (M.-Edw.); *T. hispida* (Johnst.); *Pustulipora proboscidea* (Blainv.).

A. M. NORMAN describes nine new British species of *Polyzoa*, dredged chiefly near Guernsey or in the Shetland seas.

J. ALDER gives critical comments on twelve British species of marine *Polyzoa*, the characters and synonymy of six of which had been previously in some confusion. The others are either new or additions to the British fauna. Care has been taken to secure authentic specimens for comparison; and in the case of the Norwegian forms recently discovered by Sars, samples have been supplied by that naturalist. One new genus is established.

Figures, from drawings by Alder, are given of all the species, old or new, described in these two papers, excepting *Lepralia cruenta*, *Cellepora cervicornis*, and *Eschara pavonella*.

CHEILOSTOMATA.

CELLULARIADÆ.

Scrupocellaria delilii (Audouin), a Mediterranean form, is new to Britain (Alder, p. 107).

MEMBRANIPORIDÆ.

The following new species are described by Norman :—

Lepralia venusta, *L. complanata*, *L. laqueata*, *L. divisa*, *L. polita*, *L. microstoma*; *L. cruenta*; *Membranipora sacculata*. *Lepralia cruenta* has been figured by Busk (Cat. Marine Polyzoa, p. 69, pl. 110. f. 1) as a var. of *L. violacea*.

CELLEPORIDÆ.

Cellepora ramulosa (Linn.) has the ovicells punctured, according to Busk; they are smooth and imperforate. Thus it differs from *C. dichotoma* (Hincks), from which it may also be known "by its less spinous surface, the rostrum below the aperture being blunt, and, excepting in young cells, very slightly projecting" (Alder, p. 96).

Cellepora cervicornis (Fleming). Alder (pp. 98-100) thinks, with Milne-Edwards, that this species is a true *Cellepora*, though, when young, it has the aspect of an *Eschara*. It is distinct from *Eschara cervicornis* of Milne-Edwards, a Mediterranean form, but is identical with *E. cervicornis* of Johnston and Busk. All the British forms described as *Cellepora* (or *Eschara*) *cervicornis* belong to the same species.

Cellepora attenuata, sp. n., Alder (p. 97). A branched form allied to *C. dichotoma*.

ESCHARIDÆ.

Alder is disposed to regard *Hemeschara* of Busk "as only a peculiar state of an *Eschara*, and which some species have more tendency to assume than others." The same Polyzoön (e. g. *Eschara pavonella*) may be a *Lepralia*, an *Hemeschara*, and an *Eschara* at different stages of its existence.

Quadricellaria gracilis (Sars), a Norwegian and Shetland form, is identical with *Onchopora borealis* of Busk. This species possesses curiously modified avicularia, not recognized by Sars. Busk reminds Alder that Sars's generic name is preoccupied (Alder, p. 101).

Eschara levis (Fleming). This species has the general aspect of a *Cellepora*, in which genus it was placed by Fleming. Sars shows it to be a true *Eschara*. It is quite distinct from *Cellepora ramulosa*, but includes the *E. teres* of Busk (Alder, p. 102).

Eschara landsborovii (Johnston), was at first mistaken by Alder for a var. of *E. foliacea*. To others it has hitherto been known, in its young encrusting state only, as the *Lepralia landsborovii* of Johnston. In its intermediate condition it completely puts on the features of *Hemeschara* (Alder, p. 105).

New genera and species :—

Palmicellaria, Alder (p. 100). *Polyzoary* erect, calcareous, inarticulate, cylindrical, smooth, branching dichotomously; *cells* disposed in four longitudinal alternate series, those in the two opposite series being on the same level; *apertures* circular, opening vertically, within a slight concavity, with a broad, projecting, palmate expansion in front, bearing an avicularium; *ovicells* unknown. This genus differs from *Cellepora* in its simpler structure and more regular cells; from *Quadricellaria*, in the form and position of its apertures. It contains one species, *P. elegans*, the most boreal of all the peculiarly British forms of *Polyzoa*.

Eschara lorea, Alder (p. 104). A delicate species, with rather large cells, allied to *E. saccata* of Busk.

Eschara pavonella, Alder (p. 106), is distinct from *E. cribraria* of Johnston, under which name it has been well figured by Busk (Micr. Journ. vol. iv. p. 311, pl. 10. figs. 7, 9).

CYCLOSTOMATA.

IDMONEIDÆ.

Hornera borealis (Busk), a crag species, is also a recent member of the British fauna, and differs, particularly in its ovicells, from *H. frondiculata* (Alder p. 108).

DIASTOPORIDÆ.

Diastopora sarniensis, sp. n., Norman (p. 89), who contrasts it with *D. obelia*.

CRUSTACEA

BY

C. SPENCE BATE, F.R.S.

Introductory Remarks.

WHENEVER any branch of science has arrived at such a position as to require a systematic nomenclature in all its respective details, its establishment upon a satisfactory and catholic basis is much to be desired.

The student is then not only certain that he is capable of obtaining possession of the knowledge conveyed to him by previous labourers, but can, with more ease to himself, communicate with precision the results of his own researches and observations.

The study then has passed beyond the risk of empirical or careless observation, and must rapidly advance in the path of systematic inquiry.

The British Association has done well, during the last two meetings (Newcastle and Bath), to draw the attention of naturalists to the "Series of Propositions for rendering the Rules for Zoological Nomenclature uniform and permanent," by appointing a fresh committee, whose chief duty appears to be "to correspond with foreign naturalists and others on the best means of insuring their general adoption."

That which the late Mr. Strickland endeavoured to do in behalf of zoology would be well, if it could be carried out, in relation to some of the special branches of that science.

In this Record we have to treat of the Crustacea only; and we feel certain that research in this branch of natural history would progress more rapidly and satisfactorily if carcinologists could agree to a uniformity of expression which should also have a uniformity of interpretation in distinguishing the parts of a typical crustacean.

The great amount of variation in general form, and the large degree of differentiation that each part of the animal of this class is liable to undergo, render necessary much labour and research, in their homological identification, before so desirable a nomenclature can be satisfactorily completed. Still we believe that a great convenience in description, and a more accurate appreciation of the observations of naturalists, would be the

result of a clearly defined expression of those parts in which scientific carcinologists have mostly but one opinion.

Frequent expressions of naturalists, both at home and abroad, have been conveyed to us that they consider this a very desirable object to be attained; but there are few who would not rather undergo the risk of losing their observations in the indistinct terms that have become euphonious by long usage, than see them conveyed in words more accurate and defined, but, from their novelty, less agreeable.

The use of terms that convey an erroneous impression, such as *thorax* and *abdomen*, which are homologically dubious, if not incorrect, even in relation to Insects, and in Crustacea designate parts which bear but a crude and distant analogy to those they are named after in Mammalia, must necessarily be inconvenient; while most of the other parts are left much to the fancy of the describer*.

In the year 1849, M. Milne-Edwards, in an able and excellent essay in the 'Ann. des Sciences Naturelles,' endeavoured to rectify this difficulty. He proposed a nomenclature based upon homological inquiry, and formed upon classical authority. We have little doubt that the terminology of this great carcinologist would long ere this have been accepted by naturalists, but from the circumstance of the difficulty of applying terms so long and repetitive in their expression.

A modification of the terminations of the nomenclature of Milne-Edwards, rather than wholly a new one, was suggested by Mr. Spence Bate in his Report "on the British Edriophthalma" to the British Association for 1855. This having since been adopted by the authors of 'The British Sessile-eyed Crustacea,' we intend, when necessary, to make use of it in these pages, believing that thereby we shall be more certain in the transmission of our own and others' ideas.

Again, a systematic tabulation would not only accelerate the communication of ideas, but give a consistency to the symbols used, from which they would derive an importance and signification that do not at present belong to them. We urge, therefore, in pursuance of this idea, the invariable use of the same

* To explain ourselves more distinctly. That which Prof. Dana calls the ninth or last pair of appendages of the head in the Podophthalma, he calls the second of the thorax in the Edriophthalma, while Prof. Sars names them the third thoracic feet, and Prof. Milne-Edwards in his 'Histoire des Crustacés' (which has been the common handbook of carcinologists since its publication), and after him most authors, term the external or third pair of maxillipeds ("pattes-mâchoires externes") in Podophthalmous crustacea, and the second thoracic pair of feet in the Edriophthalma. We consider them, in accordance with the last writer's opinion, to be the appendages of the second somite of the pereion (thorax), and shall invariably specify them as the second pair of *gnathopoda*, since, though appendages of the pereion, they are in a large number of different families of Crustacea organs attendant on the mouth of the animal.

sign, letter, or number to represent the individual part of each crustaceous animal persistently; and in quoting from an author, or expressing our own opinion, whenever it may be necessary to have recourse to this mode of communication, we shall adopt it invariably.

Separate Publications.

LILLJEBORG, W. Bidrag till Kännedomen om de inom Sverige och norrige förekommande Crustacea af Isopodernas underordning och Tanaidarnas familj. Upsala: 1864, 4to, pp. 31.

A monograph of the family *Tanaidæ*, with a discussion on its natural position in the class. The author has added nine new species to the genus *Tanaïs*, an account of which will be given further on in this Record.

GRUBE, A. E. Die Insel Lussin und ihre Meeresfauna. Breslau: 1864, 8vo, pp. 116, with map and 1 plate.

This Memoir is the result of a six weeks' sojourn on a small group of islands off the Croatian coast, in the Gulf of Venice. The first eight-and-thirty pages are occupied with an account of the author's journey, and observations of the places visited in the different islands of the Lussin group. The remainder is a catalogue of the animals found during his visit, together with short descriptions of the new species.

MÜLLER, F. Für Darwin. Leipzig: 1864, 8vo, pp. 91.

A discussion of Mr. Darwin's theory on the Origin of Species, in which it is tested by experiments and researches in the class of Crustacea. Although much of this work involves the consideration of Dr. Müller's discoveries in the development of the *Penæus*, we think it better to place it before the reader at the commencement of our Record.

Papers published in Journals.

HANCOCK, A., and NORMAN, A. M. On *Splanchnotrophus*, an undescribed genus of Crustacea, parasitic in Nudibranchiate Mollusca. Trans. Linn. Soc. vol. xxiv. 1864, p. 49, pls. 15 & 16. Read November 6, 1862.

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In a memoir entitled "Für Darwin," Dr. FRITZ MÜLLER discusses the truthfulness of Mr. Darwin's theory on the "origin of species," confining his test to the class of Crustacea.

I. To use his own words, "The surest way to prove the correctness of his views would be to apply them to a particular group of animals, going as much as possible into detail. Such an attempt to set up one common pedigree, whether for the families of a class, or the genera of a large family, or for the species of a rich genus, and to trace out as clearly and compre-

hensively as possible their common origin, might give one of the three following results :—

“ 1. Darwin’s propositions, if incorrect, might lead, by their application, to irreconcilable and contradictory conclusions, which accumulating would demonstrate their error with a certainty equal to mathematical proof.

“ 2. That the experiment might succeed in a more extended or more limited manner, were it possible to show, by the help of Darwin’s doctrine, in what succession the various more or less extended circles separated from the common type and from each other, and in what succession they had acquired their now distinct peculiarities.

“ Were it possible to obtain such a genealogical history of any one group of animals, the more completely this exposition included the known species, and the deeper research it made into individual forms, so much the more obvious would it make the truth, and afford convincing evidence that the theory was something more than an imaginary dream.

“ 3. Certainly it is possible, and even most probable, that the experiment might fail, from the difficulties to be surmounted, without deciding the question. Should it however succeed, it would, from its independent and perfect character, be considered evidence of real value.”

Having determined to put the experiment to the test, he fixed upon the class Crustacea as being the one most likely to afford him the fullest opportunity,—first, because there is no class of animals in which the differentiation is so great or diversified, passing as they do from the planaria-like form of the female of the parasitic *Cryptoniscus*, at the one extreme, to that of the macrurous Decapods at the other; and secondly, because the shores of the South Atlantic offered to him at Desterro the greatest amount of the most varied forms, affording species of every group except those of *Phyllopoda* and *Xyphosura*.

Before all things, a perfect acquaintance with the development of each individual form is essential; and much as has been done of late, it only affords evidence of how defective is our knowledge in this respect; for the new forms that have been found to exist in the larval stage of many species are so many arguments demonstrating the necessity of a closer inspection of the earliest stages of yet unexamined species.

II. In the commencement of this chapter Dr. Müller makes the following remark, which appears well worthy of the consideration of those who are inclined to answer this important theory from the imperfect data at our command, “That the same weight may be counted in favour of Mr. Darwin’s theory, by the absence of proved contradiction, as his opponents apply against him on the absence of proved intermediate forms between known species in the different strata of the earth’s crust.”

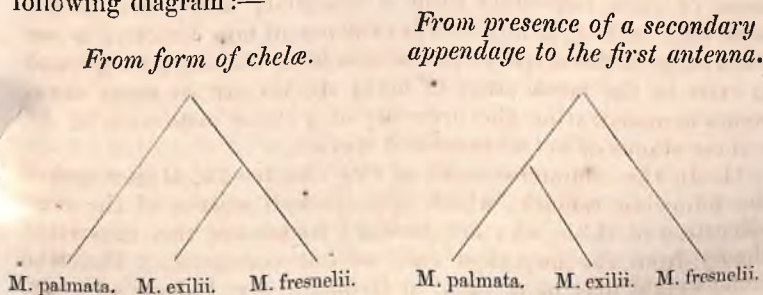
Any one who has attempted to follow out the development of a marine animal from the larval condition is aware how for months or years he may seek, and seek in vain, for intermediate forms in its chain of growth, although he knows that thousands are swimming around him. Surely no one will attribute any very great weight to such an argument.

He next treats of the subterrestrial crustacea, and contends that none of them can live long out of the water without breathing air.

The Decapod Crustacea, which are more or less inhabitants of the land, belong to very different families, such as the Ranidæ (*Ranina*), Eriphidæ (*Eriphia*), Grapsoidæ (*Aratus*, *Sesarma*), Ocypodidæ (*Gelasimus*, *Ocypoda*), &c., and must in earlier times, according to their capability, have chosen to live in the water or not, arguing that those which were air-breathers could not have descended from those found to live in water only.

He then examines the relative persistence and importance of the secondary appendage in the Amphipod Crustacea, particularly in the genus *Melita*, and argues that its persistence in a rudimentary condition in the larva, and sometimes in adult animals in which it is assigned to be absent, and its absence in certain species that assimilate otherwise in form to those genera in which it is present, are arguments strongly in favour of the idea that the separate forms come from one common ancestor.

He draws similar arguments from a new species of *Melita*, in which both pairs of gnathopoda on one side have a small hand of ordinary construction, while on the other they are developed into enormous pincers*. He contends that all the species of the genus *Melita*, inclusive of a new one with the large pincers, which he has named *M. exilii*, cannot be the descendants of one common ancestor. That is, that all the *Melitæ* with a secondary appendage to the antennæ descended from a common parent that is not the ancestor of *M. fresnellii*, and all those which had the large pair of gnathopoda descended from a common parent that is not the ancestor of *M. exilii*, as shown in the following diagram:—



III. He next tells us that in thinking out the theory of

* We suppose that this refers not to both, but to the second pair only.

Darwin he came to the conclusion that as the form which he terms the *Nauplius* form is the earliest stage of development known in an independent animal, the earlier Crustacea must at some period of their development have passed through a similar stage; that it was his conviction on this point which induced him, when he saw in the field of his microscope a young Nauplius, to trace out its history, and thus he has been enabled to demonstrate the earliest larval condition of the genus *Penæus*; and that it was this circumstance which turned the scale of his judgment in favour of Darwin's theory.

He argues that the uniform number of somites in Malacostracous Crustacea and the invariable difference of the equipment of the last seven from the others, are evidences of their descent from one common parent. He thinks that a similar argument may be based on the uniformity of the marine Decapoda passing through a Zoëa of larval condition, and contends that *Tanais* among the Isopoda possesses many of the peculiarities that belong to the Zoëa stage, and therefore may be said to represent the Zoëa among the Edriophthalma, particularly in the manner of its breathing.

We certainly do not perceive the affinity of *Tanais* through the respiratory apparatus with the larva of the Decapoda; nay, more, it appears to us to range closer with the Amphipoda, for the pleopoda in *Tanais* closely resemble the same appendages in the Amphipoda, while the respiratory process is carried on by means of branchial sacs of similar form to those of the Amphipoda, but of which a single pair only are attached to the third pair of pereopoda. The circumstance of the respiratory process being carried on beneath the carapace occurs only in those animals in which, and only to the same extent as, the carapace covers the appendages of the pereon, and no more.

Neither do we recognize the similitude of the cephalon in *Tanais* to the carapace of the Decapod Crustacea, as stated by Dr. Müller and Prof. Van Beneden. In the Decapods the carapace is indubitably the result of a monstrous growth of the mandibular somite, and its consequent overlying a greater or less number of the somites of the pereon; but in *Tanais*, as also in *Apseudes*, the resemblance to a carapace is the result of a union between the cephalon and the first somite of the pereon.

IV. Dr. Müller discusses the variation in the form of the second pair of gnathopoda as exemplified in two varieties of *Tanais*, as also in the new species, *Orchestia darwini*, of which he gives a figure. He remarks that, when found near the shore, the form of the second pair of gnathopoda varies from that of specimens found at a distance inland, where it lives under mouldy leaves in loose earth which the marsh-crab (*Gelasimus* and *Sesarma*) throws out at the entrance of its hole. He also notices the extremely large chelæ of the *Gelasimi*, observing

that this feature is a peculiarity of male crustacea generally. Another peculiarity of the male Crustacea he states to consist in the more abundant development of the membranaceous hair-like appendages of the primary appendage of the first pair of antennæ, which have been denominated auditory cilia by Mr. Spence Bate, and which Prof. Leydig and himself call olfactory organs. To such an extent does this difference exist in the Copepoda that Prof. Claus makes it a test of sexual distinction, and he thinks that this sexual difference is a strong evidence of their being organs adapted to the sense of smell. If this be the case, then, since the organ of hearing has, by anatomical investigation and definite experiment, been demonstrated to exist in the anterior pair of antennæ, it must follow that the two senses are existent in the same antennæ; and since they are, as far as research enables us to speak, supplied only by a single pair of nerves, it must necessarily follow that the same nerves must carry both the sensation of smell and the sensation of sound—a conclusion that is not consistent with our present knowledge.

The author speaks of two species of *Melita*, *M. messalina* and *M. insatiabilis*, as living in great abundance under stones on the sea-shore, in one of which the coxæ of the last pair of pereopoda are produced into a peculiarly curved form, which distinguishes it from the females of the other species. He therefore argues that since such differences exist in animals that otherwise resemble each other, "so long as it is neither proved that this species particularly needs this arrangement, or that it would be more injurious than useful to other species, so long must we consider its occurrence in these few Amphipoda to be attributable, not to designing wisdom, but to fortuitous circumstances that have acted in some way on one species differently from what they have on others."

V. Dr. Müller then treats of those Crustacea which, though allied to the marine forms in their structure, are capable of living not only out of the water, but in the burning sun of a tropical summer, and shows that these animals are endowed with two distinct organs of respiration, the one for water, the other for air. After being some time out of the water, and all the moisture in the branchial chamber exhausted (which is not until after it has been repeatedly aerated by being exposed on a fine network of hairs and again used in the branchial chamber), the animal raises the posterior portion of the carapace and admits air into a canal that exists, in *Eriphia gonagra*, posteriorly to the last pair of pereopoda; in the *Grapsoides*, above them; in *Ocypoda*, which is exclusively a terrestrial genus, between the third and fourth pairs. This variation in the position of the opening to the air-chamber is in accordance with his conception of the truthfulness of Mr. Darwin's theory.

We know not if Dr. Müller has examined the internal structure of this air-breathing apparatus; but a short time since, while dissecting a specimen of *Ligia oceanica*, in connexion with the forthcoming volume of "Isopoda" in the 'British Edriophthalmous Crustacea,' we dissected out what, when placed in the field of the microscope, appeared to be a system of tracheal tubes or canals, such as are seen in insects. Having made a drawing, we intended returning to the subject at a fresh opportunity; but since then Prof. Westwood, our valued colleague in the work, has drawn our attention to the fact that in the genus *Tylos* of the Oniscidæ, two or four of the anterior pairs of pleopoda are transformed into air-breathing organs, their interior being furnished with canals into which the atmospheric air penetrates by means of orifices analogous to the spiracles of insects, for which information we are indebted to Savigny's work on Egypt.

Considering the agreement that exists between the Ocypodida and the Grapsoidea in every minute part and organ, except in the position of the entrance to the air-breathing chamber, Dr. Müller thinks that the schools will scarcely have an answer to this fact, and must place themselves on the old theological standpoint, "so highly decried among us" (the followers of Darwin), from which the occurrence of any arrangement is considered explained when one can prove its conformability to the need of the animal possessing it.

VI. Dr. Müller then points out the variation in form and position of the heart in the Edriophthalmous Crustacea, which in the Amphipoda is in the pereion, and in the Isopoda (except in *Tanais*, where it is as in the Amphipoda), in the pleon, and draws conclusions from it favourable to the doctrine of Darwin.

VII. He then enters into the development of the Decapod Crustacea, and gives a full account of that of the genus *Penæus*, from the Nauplius form to that of the perfect animal, of which the character is shown in his paper on the development of the Prawns, at page 281. Speaking of the development of *Palinurus*, he tells us of the circumstance of Prof. Claus having taken from the ovum an embryo with a perfectly formed body, having the appendages of the pleon and of the two posterior somites of the pereion wanting; that it had a single eye, together with a pair of closely-set eyes; that the first pair of antennæ were simple, and the second provided with a secondary branch, and that the succeeding appendages were long and equally branched. And he appears to hesitate in accepting the observation of Coste, who obtained larvæ resembling *Phyllosoma* out of the eggs of this same crustacean. Dr. Müller does not appear to be aware that this same form of larva was first taken from the egg of *Palinurus* as far back as 1857 by the late R. Q. Couch, which M. Coste's observation tended to verify;

and we believe that if Prof. Claus had waited until the embryo that he tore from the ovum had completed its period of egg-life, he would have found the same; for there is little that appears inconsistent in his embryo being the immature stage of a specimen similar to that which we possess of the *Phyllosoma* form of the *Palinurus*-larva*.

He also describes the larva of an anomurous Crustacean (*Rhizostoma cruciatum*, Less.), and points out its general resemblance to the Zoëa of the Prawns. In fact, the larva of the anomurous Crustacea is an intermediate form, resembling the Zoëa of the Brachyura in the cephalon, and that of the Macrura in the pleon; but though this condition be preserved during a great portion of the periods of growth, yet the near general resemblance of the young hermit-crab to that of the macrurous Crustacea is so very considerable that it has been taken as the type of a genus by Prof. Milne-Edwards, and described as such under the name of *Glaucothoë peronii* (Ann. des Sc. Nat., March 1830). This pretty little creature not only carries four anterior pairs of pleopoda as long swimming-appendages, but has the dorsal surface of the pleon protected by crustaceous plates, and likewise has the posterior pair of pleopoda equilaterally developed, all of which conditions it loses upon taking upon itself the habits of its race, that of residing in a shell of a mollusk. They then cease to exist as free swimmers in the sea, and sink to the bottom and crawl out their existence.

We cannot forbear at this place from noticing the very great alterations from the normal conditions of a crab, which must take place in the progressive development of *Hypoconcha sabulosa* (Guérin-Ménéville, Revue et Magasin de Zoologie, No. 6, 1854) = *Cancer sabulosus* (Herbst, Naturgeschichte der Krabben, pl. 48. f. 2, 3), which genus, like *Pagurus*, inhabits the shell of a mollusk, preferring a single shell of a bivalve mollusk to that of a spiral univalve. The consequence is that the whole dorsal surface is so far covered that neither the organs of vision nor the antennæ could be of any use in their ordinary position; they are consequently inverted, and produced on the ventral surface.

VIII. In this division Dr. Müller discusses the development of the Edriophthalmous Crustacea, and compares the affinity and divergence of the several forms, particularly of the parasitical family of Bopyridæ, the adult females of which diverge to so large a degree, that in *Entoniscus* and *Cryptoniscus* they would, but for the character of their larvæ, be mistaken for Planariæ or Annelides.

In this chapter he mentions and figures the first two gnatho-

* The figure given in the 'Dublin Nat. Hist. Review' is a poor representation of the true animal, which only distantly resembles, rather than represents the form of the genus *Phyllosoma*.

poda of a new species of *Orchestia*, *O. tucuratinga*, and slightly alludes to the development of the *Diastylidæ*, which was first shown by Mr. Spence Bate, and not, as he states, by Prof. Kröyer.

IX. Dr. Müller here describes the development of *Branchiopoda*, *Copepoda*, *Ostracoda*, *Cirripedia*, *Sacculina*, &c., or those Crustacea which have the larva in the Nauplius form. He alludes to the close resemblance between the development of the *Cirripedia* and *Sacculina*, not only in the larval but in the pupa stage, the divergence of the two commencing from the period when these mouthless animals attach themselves to their future resting-place—the one building with a cement-organ a stalk on which to rest, the other sending deep fibres into the animal on which it has fastened. One great difference now exists: the cirripede ceases to be mouthless, and strikes out its limbs for food; the *Sacculina* remains mouthless, and vegetates into a sac that fills with eggs. He likewise speaks of the early division of the yolk in the ovum, &c.

X. Dr. Müller combats the opinions of Agassiz and J. Müller, who, with others, have announced that in the development of an animal the changes in form are in proportion to the variation of the species from the type of the family to which it belongs. He also disputes—and successfully, we think—the assertion of Agassiz, that the “egg-material of all animals is perfectly identical”*, by showing that in Crustacea the egg-material presents excellent marks for distinguishing the species of the same genus: in a certain *Porcellana* the ova are dark green, in a second dark blood-red, in a third gold-yellow. He denies, further, the truth of the statement that “the organs of the body are formed in the order of their relative importance, the most essential always appearing the first”†—that is to say, that the physiological and systematic value do not coincide—illustrating his opinion by numerous examples of unimportant organs appearing before others more essential to the existence of animal life, and arrives at the conclusion that a classification of a group of animals can only be natural when its genera are arranged in accordance with their “agreement with the succession of the organs in the development of the embryo,” and that a true and natural system of Crustacea must be based on the following successive changes:—

First, the different modes of the division of the yolk;

Second, the settling of the embryo;

* Principles of Zoology, part I. “Comparative Physiology.” By Louis Agassiz and A. A. Gould. Third edit. Boston, 1856. We have not the American edition by us to refer to, nor can we find the passage as quoted by Dr. Müller in the English edition of 1851; but at p. 273, paragraph 436, speaking of ovarian or primitive eggs, the authors say, “They are identical in all animals, being, in fact, merely little cells containing yolk substance, including other similar cells, namely the germinative vesicle and germinative dot.”

† *Loc. cit.* p. 278.

Third, the number of appendages found within the ovum; and suggests the annexed table as a basis of classification.

Class CRUSTACEA.

Subclass I. HOLOSCHISTA.

Complete division of yelk. No primitive stripe. Nauplius group.

Order I. CERATOMETOPA.

Nauplius with frontal horns. (Cirripedia; Sacculinidæ.)

Order II. LEIOMETOPA.

Nauplius without frontal horns. (Copepoda, except Achtheres, &c.; Phyllopoda, Penæus.)

Subclass II. HEMISCHISTA.

Incomplete division of yelk.

A. NOTOTROPA. Embryo rolled outwards.

Order III. PROTRUSA. Tail formed first. (Mysis.)

Order IV. SACCOMORPHA. Worm-like larval skin first formed. (Isopoda.)

B. GASTEROPODA. Embryo rolled inwards.

Order V. ZOËOGONA. Appendages not fully developed in the ovum. Zoëa group. (Most Podophthalma.)

Order VI. AMETABOLA. Appendages perfectly developed in ovum. (Astacus; Gecarcinus; Amphipoda, except Hyperia.)

That the necessity of the reconsideration of the classification of the Crustacea is every day becoming more apparent, we admit; but there are other points in the history of the animals that are to be taken into consideration, and require further elucidation, besides the embryonic development, which, to say the least, would be one of the most inconvenient features to accept, since it must necessarily preclude the possibility of fossil Crustacea being adopted into the system.

XI. & XII. are occupied with the discussion of the bearing of his own and others' researches concerning the development of Crustacea on the theory of Mr. Darwin; and he arrives at the conclusion that the great variation among the larvæ of Crustacea in which there is the existence of a continuous similarity in parts of minor importance, is presumptive evidence that they all descended from one original ancestor, not in a direct line of succession, but each under circumstances favourable to itself.

If the ideas of Dr. Müller be based on truth, it must follow as a necessary consequence that the development of the lost forms of Crustacea must, the more anciently they existed, have departed less from the primitive type than those of a recent fauna, and consequently more frequently have quitted the ovum in the Nauplius form than in that of the Zoëa or perfect form.

If this be true, the larva of the trilobite ought to have quitted the ovum in the Nauplius form.

The researches of Barrande have shown the existence of minute bodies which he and palæontologists generally believe to have been the larva of the Trilobite. The one great law that is manifest as common to the Nauplius and the Zoëa forms is, that progressive development commences at both extremities of the animal. The pleon and cephalon alone are present, with some of their appendages, previous to the appreciable presence of the pereion, which is developed after the larva quits the ovum. We find nothing in the development of the larva of the Trilobite that is incompatible with this idea. In the earliest stage the young trilobite consists of two nearly equal divisions, the incipient features of the great cephalon and caudal shields. If (and we think it a not untenable hypothesis) these little bodies were supplied with three pairs of appendages and a central eye, all of which are merely deciduous organs, we should have an animal that would differ in nothing essentially from the Nauplius form of recent Crustacea.

Independent of any interest that may attach itself to the arguments of Dr. Müller, some of which his opponents may not be inclined to accept, the memoir is one that every student in carcinology must study with interest, even though most of the facts have already been published in the author's memoirs on the Prawns and other Crustacea.

The industrious Hr. G. O. Sars has published another memoir of his researches upon the Crustacea found in Norwegian fjords and lakes. (Beretning om en i Sommeren 1863 foretagen Zoologisk Reise i Christiania Stift; 1864.)

His present communication is the result of an excursion made in the neighbourhood or district of Christiania during the summer of 1863, in which he directed his attention first towards throwing as much light as possible upon the marine Crustacea, of the arctic type, which had been found in the great inland Scandinavian lakes.

Although he visited many places, he sojourned longest in the vicinity of Lake Mjösen, since it seemed to give promise of a greater amount of information. From this lake he had previously obtained a specimen of *Mysis oculata* of Fabricius, and by dredging in the deeper parts he hoped to get evidence of the other two marine forms, namely *Gammarus loricatus* and *Idotea entomon*, which has been taken in the lakes of Sweden, but not yet noticed by him. Lake Mjösen appears to be much deeper than he anticipated, being, at its greatest depth, nearly 2000 feet in the line of the channel.

The bottom of the lake consisted of a dark-coloured mud, formed by the débris of decayed timber. In the line of the

channel he found numerous specimens of *Mysis oculata*, a form closely allied to *M. inermis*, and also *Gammarus cancelloides*, but which differs from *Gammarus* in having the telson undivided, and therefore in the Catalogue of Amphipoda of the British Museum has been placed in *Pallasea*, a genus founded on *Gammarus cancellus*, which was discovered by Pallas in Central Asia, and which is thought to be identical with Lovén's Scandinavian specimens.

Hr. Sars found, in consequence of the force of the current, some difficulty in getting his dredge down; so that the greatest depth at which he obtained animal life was 200 fathoms, where the soil was a fine yellow mud; and here he obtained only a large lumbricous annelid, a few kinds of insect-larvæ, and the following Crustacea:—

Phyllopoda. *Apus cancriformis*.

Cladocera. *Sida crystallina*, *Simnosida frontosa*, *Simocephalus vetulus*, *S. congener*, *Lathona setifera*, *Daphnella brandtiana*, *Holopedium gibberum*, *Ceriodaphnia pulchella*, *Daphnia cristata*, *D. longispina*, *D. galeata*, *D. caudata*, *D. aquilina*?, *Bosmina obtusirostris*, *B. lacustris*, *B. liljeborgii*, *B. nitida*, *Ophryoxus gracilis*, *Acantholeberis curvirostris*, *Eurycerus lamellatus*, *Peracantha truncata*, *Illyocryptus sordidus*, *Chydorus globosus*, *C. piger*, *C. sphaericus*, *Scapholeberis mucronata*, *Anchistropus emarginatus*, *Monospilus dispar*, *Alonella rostrata*, *Pleuroxus trigonellus*, *Graptoleberis reticulata*, *Alona affinis*, *A. costata*, *Alonopsis elongata*, *Acroperus harpæ*, *A. leucocephalus*, *Polyphemus pediculus*, *Bythotrephes longimanus*.

Copepoda. *Diaptomus gracilis*, *D. castor*, *Heterocope saliens*, *H. alpina*, *Cyclops tenuicornis*, *C. piger*, *C. lucidus*, *C. serrulatus*, *C. scutifer*, *C. gigas*, *C. nanus*, *C. leuckartii*, *C. macrurus*, *C. bicolor*.

Ostracoda. *Cypris pubera*, *C. incongruens*, *C. minuta*, *C. fuscata* (?), *C. compressa* (var.).

A short notice appears in the 'Annals and Magazine of Natural History' for 1864, vol. xiv. p. 467, and in the 'Archives des Sciences Phys. et Nat. Genève' for the same year, p. 84, on the previous researches of Hr. G. O. Sars on the Crustacea found in the neighbourhood of Christiania, in the years 1861–1862.

The Rev. ALFRED MERLE NORMAN has drawn up (Transactions of the Tyneside Naturalists' Field Club, vol. vi. p. 183) a Report of the Crustacea dredged off Seaham and Berwick, in connexion with a committee formed by the British Association and Tyneside Naturalists' Field Club to dredge the coast of Northumberland and Durham, as well as the Doggerbank. The total number of Crustacea taken were sixty-three, of which Mr. Norman reports upon the Decapoda, Edriophthalma, and Saccalinidæ, of which he gives a list.

In the same general Report Mr. George S. Brady communicates the genera and species of the Entomostracous Crustacea

that were taken. They consisted of nine species of seven genera, of which five had not previously been recognized as British. These were: *Evadne polyphemoides* (Leuckart), *Ichthyophorba denticornis* (Claus), *Ichthyophorba angustata* (Claus), *Dias longiremis* (Lilljeborg), *Phaëna spinifera*? (Claus). Mr. Brady considers *Diaptomus longicaudatus* of Lubbock to be identical with *Temora finmarchica*, Gunner.

In this Report his list differs materially from that presented to the British Association in the previous August, the nomenclature being adopted from the recent work by Claus.

In the same Report there is a short communication on the 'Pycnogonoidea' by Mr. Hodge, who says that only two species were obtained, *Pycnogonum littorale* and *Phoxichilidium petiolatum*, and of these but two or three specimens of each.

BRACHYURA.

In Sillim. Amer. Journ. 1863, vol. xxxvi. p. 233, and in the 'Annals of Natural History' for January 1864, p. 16, there is a short communication by Professor DANA on the homological relation of the various parts of the Insects to those of the Crustacea. This paper is intended as an explanation to a note (p. 193 in the twelfth volume of the latter journal) which is appended to an article (by the same author) on cephalization.

The author illustrates his idea by a diagram, and contends that in Insects there are eighteen somites, instead of thirteen as commonly received, of which six belong to the head, three to the thorax, and nine to the abdomen; that in Crustacea there are twenty-one, of which nine belong to the *cephalon*, five to the *pereion*, and seven to the *pleon*. In arriving at this conclusion in Crustacea, his data are drawn from the highest Decapoda only.

It is not without surprise that even in this order we find that Prof. Dana can draw the inference that the gnathopoda, or first two pairs of appendages of the pereion, belong to the head, simply because they are closely attendant upon the mouth. Surely the appendages hold the same anatomical position in the lobster as in the crab, and in the prawn as in the lobster; yet we see them gradually changing their appearance until they are uniform in character with the pereopoda. Dissection demonstrates, even in the crab, that they are attached to the first two somites of the pereion; and we have the strongly expressed evidence of the separation of the cephalon from the pereion, and the pereion from the pleon, in the progressive development of the young animal. In the cephalon the new appendages produced after the larva has quitted the ovum are posterior to the mandibles, and anterior to the gnathopoda. Those which belong to the pereion are developed posterior to the two pairs of gnathopoda,

and anterior to the pleon. In the pleon all the somites are developed except the antepenultimate, which is afterwards produced by a division of the ultimate.

Now we contend that the newly-developed organs mark the separation between the different parts of the animal, and that each consists of seven somites. To this the insect-type would bear a very close analogy, if we suppose that the lessened number of somites is due to the suppression of the third and seventh of the cephalon, and the two first and two last in the percion, of the typical Isopod.

We certainly think that, before the homological relation of the several parts of a crustacean can be conclusively demonstrated in the insect, there should be a uniformity of opinion among carcinologists as to the homologies of the different orders of Crustacea.

M. CH. ROUGET states, in a note ('Comptes Rendus,' vol. lix. p. 851), that the similarity of the mode of the termination of the motor nerves which M. Kuhn thought he had established in the Articulata, and which had long since been indicated by M. Doyère, with that which M. Rouget had himself demonstrated to exist among the superior Vertebrata, was contrary to the most direct observation. M. Rouget then sets forth the result of his observations on the termination of the motor nerves among Crustacea (*Cancer* (*Carcinus*?) *mænas*, *Astacus*), as well as among some of the larvæ of Dipterous and Coleopterous insects.

He states that the terminal cone described by Doyère among the Tardigrades, and by M. Quatrefages among the Eolidines, truly exists, but that it is not itself the true termination of the nerve. After detailing shortly his researches, he states that there is no trace of a terminal organization analogous to that which he has shown to exist in the superior classes of Vertebrates; but, on the contrary, there is much resemblance between the mode of termination of the fibres of the motor nerves of the Articulata with that which he has described as existing among the Batrachians.

It results, he says, from his observations, that there is no similarity between the termination of the motor nerves of the higher Vertebrates and those of the Articulata. For whilst among the Articulata and the inferior Vertebrates the "*cylinder-axis*" presents not any modification of appearance or structure at its terminal extremity, in the three superior classes of Vertebrates the "*cylinder-axis*" spreads out in the form of a finely granulated plate, accompanied by a special agglomeration of plasmatic nuclei. One disposition alone is common to all these modes of termination. Moreover the essential element of the nervous fibre penetrates through the sarcolemma until it reaches a bundle of muscular fibres, and the substance of the

"*cylinder-axis*" is brought into immediate contact with the contractile substance without mixing or becoming continuous with it.

Dr. M'INTOSH, in a paper ('Trans. Linn. Soc.' vol. xxiv. p. 79), described, in 1863, the form and character of the hairs found on different parts of the common shore-crab. Upon the examination of a great number of specimens, he found a wonderful sameness in the essential structure of the hairs in like situations. While doubting whether the hairs, which we elsewhere have named *auditory cilia*, are endowed with any special sense, he yet considers them to be the most sensitive organs in the entire animal. While opposing the view that they are connected with the sense of hearing, he states, in a note, that otolithes or their homologues exist in the cavity at the base of the external antenna in *Carcinus menas*. In this the author is undoubtedly mistaken, as may be demonstrated by the excellent observations of Dr. Hensen on the organs of hearing in Crustacea, as well as by our own experience.

The author notices but little the curious hairs armed with lateral curved spines that are attached to the branchial flabella, which probably fulfil the office, suggested to us by the late Prof. Quekett, of passing over the margins of the branchial plates, and so permitting the more ready access of water to the entire respiratory surface.

In 1863 Dr. V. HENSEN published the result of very extended researches upon the auditory organs of the Decapod Crustacea ('Zeitschr. f. Wissensch. Zoologic,' xiii. Bd., 3. Hft. 1863), an abstract of which appeared in the February number (1864) of the 'Archives des Sciences de Genève,' and also in the first volume of the fifth series of the 'Ann. des Sciences Naturelles.'

In this interesting memoir Dr. Hensen gives the details of his examination of these organs in twenty-eight different species of Decapoda.

He first reviews the observations of previous authors, and appears to have made himself acquainted with the writings of every carcinologist upon the subject, except those of Mr. Spence Bate, published in the 'Annals and Magazine of Nat. Hist.' ("On the Homologies of the Carapace, and on the Structure and Function of the Antennæ in Crustacea," July 1855), and the Report of the "British Edriophthalma" in the 'Report of the British Association' for 1858; in which are figured, in the former, the auditory apparatus of the Brachyurous Crustacea, and in the latter, what the author considered to be the auditory cilia of the Amphipoda.

Dr. Hensen next speaks of the otolithes, and demonstrates that the sand found in the auditory chamber of the Prawns is

nothing but common sand, which he has observed introduced by the free will of the animal, and is repeated after every moult; but in those Crustacea in which the auditory chamber is closed, the otolithes, which are cast at every successive moult also, are again reproduced; these, from thier behaviour with chemical reagents, Prof. Himly, who tested the substance of 200 stones for the author, thinks to be fluat of calcium. He next treats of the auditory chamber and the auditory hairs, of which three kinds are distinguished:—

1. Hairs attached to the otolithes.
2. Free hairs of the auditory chamber.
3. Auditory hairs situated on the external surface of the animal.

The first exists chiefly among the macrurous Decapoda, in some cases springing from among the otolithes, in others supporting, as in the tail of *Mysis*, the otolithe in its position.

The second kind of hair exists in the auditory chamber of the Brachyurous Decapoda, which contains no otolithe, but a chamber filled with a fluid, in which these hairs stand in great numbers.

The third kind exists on the peduncle of the first antenna, and on the second joint of the second antenna, and, in *Palæmon*, on the rami of the posterior pair of pleopoda. In *Mysis* the auditory apparatus is situated on the inner ramus of the posterior pair of pleopoda; so that the function of hearing must be considered as established in this part of the body. He also found them on *Gebia*; but he found no auditory hairs on any other part of the animal. In *Palæmon squilla* the auditory hairs are replaced, as the animal increases in age, by those of the ordinary kind.

Among the Brachyurous Crustacea there are no otolithes, but a complicated calcareous chamber, as first described by us in the 'Annals of Nat. Hist.' for 1855, within the first joint of the peduncle of the first antenna, the cavity of which Dr. Hensen says is provided with hairs.

After describing the form and structure of the auditory hairs, as well as the different character of apparatus in distinct groups of Crustacea, he classifies them under the following heads:—

1. Those which have one otolithe within the auditory chamber, as *Lucifer*, *Sergestes*, *Mysis*, *Hippolyte*, and *Mastigopus*.
2. Those which have no otolithe and no auditory chamber, as *Alima*, *Erichthus*, *Phyllosoma*, *Thysanopoda*, and *Pandalus*.
3. Which have a chamber with numerous otolithes, as *Palæmon*, *Pasiphaë*, *Crangon*, *Alpheus*, *Astacus*, *Gebia*, *Pagurus*, *Palinurus*, *Nephrops*, and *Lithodes*.
4. Which have a closed auditory chamber, but no otolith, as *Porcellana?*, *Hippa*, *Pinnotheres*, *Myctiris*, *Ocypoda*,

Grapsus, *Nautilograpsus*, *Sesarma*, *Lupea*, *Platycarcinus*, *Pilumnus*, *Chlorodius*, *Gelasimus*, *Trapezia*, *Carcinus*, and *Hyas*.

He then enters upon the physiology of the subject, first asking, Are crabs conscious of sounds? and secondly, How do they hear them?

Dr. Hensen chiefly performed his experiments on animals living in vivaria or in glass vessels, and took every possible care to preclude the interference of other phenomena, such as sight, &c., with his experiments. And he chiefly preferred to make use of such instruments in the production of sound as would conduct it into the water.

Sound made in the air he found to have no effect on animals living in the water; and sound made with a fife or bell in contact with a membrane connecting the same with the water produced only weak impressions; the effect of which was that if a peculiar sound was made, the crab would jump at first as if from fright, and then quit the place. But these movements the animal has the power of controlling; and those which have frequently been experimented upon are seldom able to be made to jump after the first time. In this way he got mostly negative, but also some positive results, which were so decided as to leave nothing to be desired.

He has observed young freshly-caught specimens of *Palæmon antennarius* on the first experiment leap out of the water by any sound made on the floor, or against the sides of the vessel; but a shaking of the side, unaccompanied by sound, the animal took no notice of. Other experiments of a similar character also demonstrate that the Decapod Crustacea have the power of hearing.

In order to identify the organs made use of in hearing, Dr. Hensen performed some very interesting experiments with a small quantity of strychnine deposited in the water, with curious results. Under these circumstances, even the slightest sound about the house produced marked effects. The animals could be made to spring about the vessel in which they were; and it is remarkable that, without much trouble, no effect is producible on the outer antennæ. When the animal has suffered much from the strychnine, and is lying upon its side at the bottom of the basin, it can be lifted up by the outer antennæ with a pair of pincers, or the glass may be shaken, without producing the slightest effect upon the animal; but if a sound be produced, the creature is immediately excited, and after making a powerful spring, again sinks to the bottom, where it continues in strong convulsions. Upon being placed in fresh water (*i. e.* in marine water without strychnine) it again revives, and soon swims about.

When not in immediate contact with the walls of the vessel,

if these crustacea hear a sound, they suddenly sink to the bottom, where they remain quiet for a time. *Mysis spinulosus* is very excitable, and all that is said of *Palæmon* can be said of *Mysis* in a higher degree.

The organs of hearing of *Mysis* being in the posterior pair of pleopoda, it is very easy to remove the two inner branches of that appendage, and with them all the auditory apparatus of the tail. Under this condition the author could not get any of the animals so treated to live beyond the 26-28 hours, and these for a short time before death generally show symptoms of excitability. The cause of this excitability was difficult to establish, since the animals were not in a normal condition; but several very convincing experiments induced the author to believe that sound was the true cause.

Dr. Hensen had fully anticipated that the hearing-organs, which had been removed, were essentially necessary for the effect, and therefore was a little disappointed at the result.

He has observed *Carcinus maenas* to stop upon the least noise; if walking about a room at night, it will immediately stop if called to. He attempted to blind the animals; but they so soon died in consequence, that no conclusions could be arrived at.

In many of these experiments there must be very considerable doubt as to the result, in consequence of the animals being so very susceptible to the slightest movement of air that came into contact with them.

Having arrived by these experiments at the conclusion that these Decapod Crustacea were conscious of sound, his next object is to show through what organs the consciousness of sound was conveyed to them.

Although for some time Dr. Hensen felt convinced that certain hairs had some connexion with the consciousness of sound, yet it was only after a long study of this interesting problem that it became clear to him that each hair was adapted to receive its own peculiar sound. He thinks that each hair vibrates to a separate note; but of this he has not any strong evidence, beyond the circumstance that the auditory hairs differ from each other in length as well as in diameter.

Experiments on the auditory hairs on the tail of *Mysis* were made in the following manner:—A small brass box with a glass bottom, a hole through which was closed by a cork, into which a needle, that held the animal to be experimented upon, was thrust. The box was filled with water, and thus the animal, with the aid of a good penetrating lens, could be observed in every position. On the opposite side of the box is firmly screwed a sound-guiding apparatus, which resembles somewhat the *cavum tympani*, and is brought in close contact with the animal, while at the opposite extremity of the tube is a plate on which a piece of india-rubber is screwed; this plate divides the inner pipe

from the water, and stands opposite to the needle. In this way he found that if a horn be blown, the sound could be distinctly heard in the water.

Under these conditions, Dr. Hensen found that a certain auditory hair* which only vibrates under one sound, will, under a different note, shake to the very base so powerfully that it cannot be distinctly observed, and that as soon as the sound ceases the movement also ceases. But if at the same time one looks at another hair, it will under that peculiar note be found to be standing quite still, or be only gently moving, and that it can in its turn, by another note of the scale, be brought into strong motion.

To illustrate the extent to which Dr. Hensen believes this to be capable of being carried, he has drawn up a scale of musical notes, adapted for the various sorts of hairs which belong to this sense.

MAIIDÆ.

Pugettia lordii, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 662, from Vancouver's Island to San Francisco.

EURYPODIDÆ.

Oregonia longimana, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 663, from Vancouver's Island.

CANCERIDÆ.

Platycarcinus recurvidens, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 663, from Vancouver's Island.

XANTHIDÆ.

Chlorodius imbricatus, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 664, from Vancouver's Island.

ANOMURA.

HOMOLIDÆ.

Cryptolithodes typicus (Brandt). Mr. Spence Bate describes the male of this species (Proc. Zool. Soc. 1864, p. 664).

Cryptolithodes alta-fissura, sp. n., Spence Bate, l. c. p. 665, from Vancouver's Island.

Petalocerus bicornis, sp. n., Spence Bate, l. c. p. 666, from Vancouver's Island.

GALATHEIDÆ.

The Rev. A. M. Norman, Trans. Tyneside Nat. Field Club, says that *Galathea dispersa* (Spence Bate) is clearly synonymous with *Galathea intermedia* (Kröyer).

* It should be understood that the organs that Dr. Hensen calls auditory hairs are not those to which Mr. Spence Bate had given the name of auditory cilia. These latter are membranous appendages that Dr. Hensen believes have nothing whatever to do with the power of hearing.

PAGURIDÆ.

Eupagurus kennealyi, sp. n., Stimpson, Proc. Acad. Nat. Sc. Philad, 1864, p. 153, from Puget Sound.

MACRURA.

PALINURIDÆ.

M. ALPHONSE MILNE-EDWARDS has made a very interesting and curious observation (Comptes Rendus, tom. lix. p. 710) on the abnormal transformation of one of the organs of vision into an antenna.

The species (*Palinurus penicillatus*, Olivier) formed part of a considerable quantity of Crustacea from the Mauritius, which had been sent by M. Roget de Bellouget to the Paris Museum. "On the right side, the appendages of this large crustacean present nothing abnormal: the first somite of the head supports, as ordinarily, a pedunculated eye; the second carries the first or internal antenna; and the appendage to the third is the large second antenna. On the left side they are found symmetrical with those on the right of the second and third somites; but the ophthalmic somite instead of carrying an eye supports a long multiarticular filament, resembling the terminal flagellum of an antenna. The ocular peduncle is preserved in its ordinary form; and a portion even of a rudimentary cornea is distinguishable at its extremity, from the centre of which arises the flagellum, which is about 4 centimetres in length. It is minutely articulated, and furnished with hairs upon the superior border of the terminal division, a character that is equally applicable to the secondary branch of the first antenna."

Monstrous developments of this kind appear to be very rare among animals. An occasionally abnormal production of the great chelæ of the edible crab is known. And a case has been placed on record in which the organs of generation are developed as male organs upon one side, while they are female on the opposite. But neither of these assimilate to that described by M. Alphonse M.-Edwards, which he considers to resemble the transformations that are found in plants, and by which we may be enabled to trace the origin of the several parts by discovering to what they will return, as soon as the developing force of any particular organ is withdrawn.

It would have been a matter of interest if we could have been told whether this abnormal production was the result of an accidental injury, and thus nature, in her effort to reproduce an organ of vision, only produced an imperfect antenna, or whether it was a monstrous organ from its first production, and reproduced from each successive moult in an enlarged form.

CRANGONIDÆ.

Hr. A. Boeck (Forhandl. Vidensk. Selsk. Christiania, 1864, p. 189), assisted by Dr. Danielssen, has described, from the coast of Norway, a new genus, to which he gives the name of *Synhimantites*, on account of the peculiarity of the form of the caudal appendages. It differs from other genera in having a broad flat masticating blade to the mandible, to which is also attached a broad two-jointed appendage. To the species on which the genus is founded the author has given the name of *Synhimantites typicus*.

The Rev. A. M. Norman, Trans. Tyneside Nat. Field Club, 1863-1864, p. 184, says that *Crangon nanus* (Krøyer) is identical with *C. bispinosus* (Westwood), Krøyer's name having the precedence.

PALÆMONIDÆ.

Signor TAMARELLI has described (Atti della Società Italiana di Scienze Naturali, vol. vi. p. 363) several species of Crustacea that have been found living in the fresh waters of Italy:—

Hippolyte desmarestii (Millet), which he believes to be identical with a crustacean that was imperfectly described by Rafinesque (Précis des découvertes somiologiques: Palermo, 1814, p. 22) under the name of *Simmetus fluviatilis*, and found in the streams of Sicily.

He also announces having found *Telphusa fluviatilis*, Martens, 'Ueber einige Fische und Crustaceen,' 1857, in Lakes Albano and Garda, and describes fully *Palæmon lacustris* of the same author*: it seems much to resemble *P. squilla*, having six or seven teeth upon the upper margin of the rostrum and two or three below. It was found in the neighbourhood of Pavia and Modena.

Hippolyte prionota, sp. n., Stimpson, Proc. Ac. Nat. Sc. Philad. 1864, p. 153; *H. suckleyi*, Stimpson, p. 154; *H. stylus*, Stimpson, p. 154; and *H. gracilis*, Stimpson, p. 155: all from Puget Sound.

Hippolyte esquimaltiana, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 666, from Vancouver's Island.

The Rev. A. M. Norman, Trans. Tyneside Nat. Field Club, 1863-4, p. 184, says that *Pandalus brevirostris* (Rathke) is *Hippolyte thompsoni* (Bell) = *Pandalus thompsoni* (Norman) = *P. barlei* (Spence Bate)†. This species ranges from Norway to the Adriatic.

Two species of *Hippolyte* are mentioned (Forhandl. Vidensk. Selsk. Christ. 1864, p. 189) as having been found by Hr. Boeck on the coast of Norway, which agree with those which Hr. Danielssen has named, but not described, in his report of a journey from Finmark ("Nyt Magazin for Naturvidenskaberne for Aaret 1861), *Hippolyte koreni* and *H. liljeborgii*.

PENÆIDÆ.

Since the erratic oceanic Zoëa was first indicated by Slabber,

* In the body of the paper the name given is *P. lacustris*, but in the title it is given as *P. palustris*. We presume the latter to have been a typographical error.

† Qy. *P. jeffreysii*? There is no *Pandalus barlei* (Spence Bate).

and demonstrated by Vaughan Thompson to be the larval condition of the common crab of our coast, many important and interesting observations on the morphological development of Crustacea have been made by different naturalists; but we think that few have been more unanticipated than the recent discovery of Dr. FRITZ MÜLLER on *Penæus*.

We have long since been enabled to distinguish upon general principles between the larvæ of Brachyurous, Anomurous, and Macrurous Decapods; but from the characteristic forms of the larvæ of these orders some very remarkable departures have been discovered by naturalists.

The first, which are as important as any, are the researches of Rathke on the Crayfish (*Astacus*), and Professor Westwood on the Land-Crabs of the West Indies (*Gecarcinus*), in which we find the apparently universal law of the development of Crustacea set aside, in order that the young of freshwater decapods may assume a general resemblance to the parent before it is entrusted with the care of its own existence.

For some time observation remained at a standstill, as if naturalists had arrived at the limit, and exhausted research upon the subject. But at the Meeting of the British Association held at Dublin (1857), the late Mr. R. Q. Couch announced the curious and important discovery that the larvæ of *Palinurus vulgaris* bore a very close general resemblance to the adult form of the genus *Phyllosoma*. Here we see another remarkable and extreme variation in the morphology in this order of Crustacea; and still more recently Dr. Fritz Müller tells us that the larva of the genus *Penæus*, if not that of other genera of the Prawns, passes through a morphological development, of which the earliest form assimilates very closely in its general appearance to that of the larval forms of the Cirripedia, Lerneans, and some entomostracous Crustacea, before it arrives at that which we are inclined to regard as the normal type of the Macrurous larva.

Great numbers of the larvæ of Crustacea were observed by him to be swimming about in the sea during the southern summer months; some of these he was enabled to trace from the youngest stage to that of the adult form. It is true that in the chain there are one or two links wanting to make the connexion perfect, which at no distant period we hope that he will be fortunate enough to add*.

In the youngest stage the larva is destitute of distinct somites; it is pyriform, 0·4 mill. in length, rounded in front, and 0·2 mill. in breadth at the widest part, which is just behind the head, and gradually narrows posteriorly until at its narrowest, where the breadth is just $\frac{1}{3}$ th of the length of the animal—that is at the

* Since this has been in type, Dr. Müller informs us that the several links in the progressive development have been established by him, closer than, for want of space, he has been able to demonstrate in his work.

caudal extremity, which terminates on each side in one long and one short spine, the intermediate space being slightly concave. In the centre of the anterior margin is a small, black, clearly-defined eye. To the lower surface of the body are attached three pairs of appendages. The first is unbranched, furnished with a few simple hairs, and situated close to the frontal margin. The second is immediately behind the first; it is biramose, and has both branches furnished with ciliated hairs. These two pairs of appendages are nearly as long as the animal, but the third pair is only half that length; like the second, it is biramose, and furnished with ciliated hairs on each branch.

The little creature is rather opaque and of a brownish colour, darkest towards the extremities of the appendages.

It is by these little appendages that the young animal swims, lashing the water in a manner that Dr. Müller compares to a man floating perpendicularly, with outstretched arms, having slender willow branches in each hand, working his way upward.

The first progressive change observable is that of a larva slightly larger, being 0.5 mill. in length. The colour and appendages resemble those of the previous specimen; but the posterior extremity of the body is drawn out into two thick conical processes, at the apices of which remain the two long caudal hairs, as previously observed, to which several others less prominent have been added. The number of hairs upon the natatory appendages has increased also.

At this stage the first indication of the carapace is seen in the presence of a transverse line across the dorsal surface of the animal. In this we see an important variation from the forms of either the Cirripedia or Decapod Crustacea, but one that assimilates it to the progressive changes of the larvæ of certain Schizopoda.

In the larvæ of the Decapods and Cirripeds the carapace is defined from the very commencement. In that of *Mysis* and other Schizopoda the form of the animal is more perfectly annulose, and the growth of the anterior somites into a great dorsal protecting shield, is one of progressive development. In the larva of *Penæus* the line which defines the future carapace is immediately behind the third pair of appendages—that is, behind that pair of appendages which ultimately become the mandibles, anterior to which, and just before the mouth, is a very large helmet-shaped protuberance, which Dr. F. Müller denominates the upper lip. In the anterior pair of appendages, the homologue of the future anterior pair of antennæ, the development of some organ has evidently commenced; while in the enlargement at the base of the posterior pair the outline of the future mandible is distinctly recognizable, showing that after the succeeding moult these organs will have lost, with their hair-like attachment, their pediform character, and pass into the

condition of true mandibles. Posterior to these, four pairs of lobes have made their appearance upon the ventral surface; these are the embryonic stage of the four next succeeding pairs of appendages. The intestine, liver, and heart at this period are of the same form as those of the earliest larval condition of the Brachyura. The eye still continues to be a solitary central organ; and, concealing it from above, an opaque granular tissue has been formed, from which projects a small transparent process, to which Dr. Müller fails to assign a purpose.

The rudimentary appendages exhibit within their several sacs the presence of hairs, which induces Dr. Müller to believe that after the next succeeding moult they will become effective, and pass the animal from its immature stage, to which the author has given the name of the *Nauplius* form, into that which assimilates more nearly to that of the larva of the macrurous Decapods which are recognized under the general term of *Zoëa*.

At this stage we have a leap, but certainly not more than we meet with in certain other forms of Crustacea which we are accustomed to recognize as having their development made out.

The difficulty of preserving the life of these delicate creatures has not yet been overcome. The newly hatched larva from the commonest, and, we might assume, the hardiest crabs, has not been preserved beyond the second stage; and the link between what is termed the larva and the pupa stages of the cirriped has not been demonstrated. It is, therefore, not to be demanded that Dr. Müller should succeed beyond the step at which others have stopped. It is only necessary for him to show assimilation of conditions to enable us to accept his conclusions.

In the next stage the larva has about doubled its length, and it is during this period that the two eyes are developed; ten or eleven new somites are formed, with a pair of appendages attached to the first, and the rudiments of appendages to the five succeeding, as well as the lateral caudal appendages to the penultimate somite of the pleon. These several parts vary somewhat in form; but in other respects the animal undergoes no important changes, even in size, except length, which is almost exclusively due to the gradual extension of the eleven new somites.

The carapace, from 0.4 to 0.5 mill. long, at first is almost circular and flat, but soon it bends laterally downwards and covers the basal portions of the anterior appendages, and projects posteriorly over two or three of the newly-formed somites. Anteriorly it is at first hid by the contiguous newly-developed organs of vision. When these separate, it covers and protects the base of the ocular peduncle with a triangular process that runs out into a spine that reaches to the length of 0.12 mill. The carapace has no other spiniform process. Between these two eyes, now in the progress of development, and beneath and

at the base of this newly-formed rostrum, the solitary eye of the embryonic larva is still visible.

The antennæ continue to be the chief instruments of locomotion, in which these animals offer an essential difference from the larvæ of the Brachyura, Anomura, and many of the Macrura and Stomapoda, where locomotion is produced by the aid of the gnathopoda.

This fact appears to be in accordance with a uniform law in the development of these animals. When the larva quits the ovum in an early stage, the antennæ become the organs of locomotion. If in a later stage, then the appendages of the mouth are the organs by which locomotion is produced; but those which are retained in an embryonic condition until a still later stage of development are furnished with those organs of locomotion which they retain through life.

In stating that the organs of locomotion in the larvæ of *Penæus*, Cirripedia, and others, are the antennæ, it must be remembered that they are not the antennæ of the adult animal, but deciduous appendages that are wholly replaced by permanent ones; whereas in the larvæ of the Brachyura the deciduous organs represent, not the entire adult organ, but only the secondary parts of the same, the permanent appendages budding out from the base of the deciduous organs, which are afterwards lost. In the third stage, represented by the freshwater and terrestrial Crustacea, no deciduous appendages exist at any period, but the embryo is retained under incubation until the permanent appendages are formed.

Dr. Müller traces the progressive development of the several organs, of which the pair of permanent eyes are the first which make their appearance.

The new somites, to which the appendages of the pereion and pleon are attached, form at first an unjointed, soft, short band, in which very rapidly the demarcation of eleven somites may be detected before it has attained the length of that portion of the pleon which exists posteriorly to it. This is shortly followed by the development of their respective appendages, which at first are but small foliaceous lobes; these afterwards become biramous appendages, and give to the animal a close affinity to that of a young stomapod. It is this stage that Dr. Müller calls the "Mysis form." In this form the larva was observed before it was 2 mill. in length, and it continued to grow in dimensions until it was 4.5 mill. in length. It was during this period that the auditory organs, the chelate and other pereopoda were developed, as well as the branchial organs, the mandibular appendages, and pleopoda.

Dr. Müller likewise describes the progressive appearance of the auditory apparatus. From this stage there is but little alteration to that of the young prawn. The frontal process has

three teeth above. The antennæ remain in the same state. The eyes have lost the small appendage that was attached to them in the last form. The central eye has almost disappeared. The mandibular appendage has become two-jointed; and other changes characteristic of the adult animal have taken place. The animal at this period—the largest that has been examined—has attained the length of from 9–10 mill.

In a short appendix, Dr. Müller describes the forms of the larvæ of two or three other species, and announces one of so different a progressive morphology as to induce him to take some future opportunity to describe it.

EUPHAUSIDÆ.

In the 'Ann. and Mag. of Nat. Hist.,' vol. xiv. 1864, p. 461, and the 'Archiv. des Sci. Phys. et Nat.,' tom. xxi. p. 87, is a short notice of the description of *Lophogaster typicus* published by Prof. Sars in 1862. This Crustacean is an exceptional form, and holds an intermediate position between the Stomapoda and Macrura. This is shown in the nature of the branchial organs, which are branched like the posterior branchiæ of the Euphausidæ. The upper part of the ramification is covered by the carapace, as in the Macrura, whilst the median and lower branches hang down freely in the water, as in the Euphausidæ. It is therefore argued by the author that the Stomapoda are but degraded forms of the same order as the Macrura. The development of the young of *Lophogaster* is precisely similar to that of *Mysis*.

MYSIDÆ.

Prof. Sars describes several Norwegian species of the genus *Thysanopoda* (Om Slægten *Thysanopoda* og dens norske Arter. Forh. Vidensk. Selsk. Christ. (aar. 1863), 1864), first giving a full description in Latin of *Thysanopoda norvegica* (Sars), which he had previously described (Forh. Skand. Naturf. i Christiania, 1856, pp. 169–174).

In this description Prof. Sars says that the *eighth pair of thoracic feet* are rudimentary. We really are at a loss to know what appendages these can mean; we must assume them to be the posterior pair of pereopoda, because they are the last described; but we think that there must be some mistake in describing in a Decapod Crustacean eight pairs of limbs as belonging to the pereion. That Prof. Sars has not counted the appendages of the cephalon is quite clear; for in his description of *Thysanopoda norvegica* he mentions the first six pair of the appendages of the pereion (pedes thoracici) after the (maxillipedes), and these after the second pair of siagonopoda (maxilla secundi paris). This is giving to these Norwegian *Thysanopoda* a pair of appendages more than belongs to this order of Crustacea.

In his description he gives a full account of the form and

variations of the branchial appendages, and a description of certain anomalous organs that he regards as eyes. These are eight in number, of which four are paired and situated in the coxæ (Rodleddet*) of the second and seventh pairs of *thoracic feet*; considering Prof. Sars counts eight pairs, we think that they are identical with the second pair of gnathopoda and the fourth pair of pereopoda. The four other of these organs are single, and situated in the median ventral line of the four first somites of the pereion. He describes them as being of a spherical shape, and consisting of a convex or almost semi-globular projection beneath the transparent skin. He agrees with Krøyer that they may be divided into two parts, an upper and a lower. They are of a firm and elastic nature, and shine through their capsules, especially the lower half; but Krøyer does not believe them to be eyes, because the species of *Thysanopoda* are already provided with organs of vision.

In a supplement to the preceding account, Prof. Sars enters more fully into the nature of the remarkable organs of sense situated on the body of the Thysanopoda, and describes more-over the characters of two new species, viz. *Thysanopoda raschii* and *Th. nana*.

In these species the peculiar and anomalous organs are present in all respects as in *Th. norvegica*. They have been observed by Prof. Dana in the genus *Euphausia*, and described by him as glands. But Prof. Sars contends that they are eyes, and considers that he has got over one of the objections raised by Krøyer against that opinion by showing the presence of "a bright-hued pigment" in living specimens. Two pairs of similar organs have also been observed in a segment of the body of the genus *Polyophthalmus* of Quatrefages.

Hr. G. O. Sars (Oversigt af de i Christianiafjorden forekom-mend Mysider, p. 240, being a supplement to a memoir entitled Beretning om en i Sommeren 1863 foretagen Zool. Reise, in Nyt Mag. for Naturv.), who has directed much attention towards the Crustacea existing in the fjords of Christiania, describes some new species of *Myside* which he has found there, and adds to the family two new genera, classifying them as follows:—

MYSIS (Latr.).

a. Lamina caudalis media (telson) apice fisso.

1. *Mysis fleucus* (Müller).—2. *M. inermis* (Rathke), being synonymous with *M. cornuta* (Kr. Nat. Hist. Tidsk. 3 dec. Række 1, p. 26).—3. *M. truncatula*, sp. n.—4. *M. ornata*, sp. n.—5. *M. aurantia*, sp. n. (*M. lamorneæ*, Goës, nec Norman).—6. *M. insignis*, sp. n.

b. Lamina caudalis media (telson) apice integro.

7. *Mysis vulgaris* (Thompson).—8. *M. gracilis*, sp. n.

* Literal translation, "principal joint."

MYSIDOPSIS, g. n.

This genus is founded upon *Mysis didelphys* (Norman), which differs from *M. vulgaris* in being a little more robust in form, in having the antennal scale somewhat less produced, with the second joint shorter, and in having fewer cilia to the telson; so that we do not quite see the convenience of grouping it (as Hr. G. O. Sars has done) with two other species to form a new genus as follows:—

1. *Mysidopsis didelphys* (Norman).—2. *M. gibbosa*, sp. n.—3. *M. angusta*, sp. n.

NEMATOPUS, g. n.

1. *Nematopus elegans* (G. O. Sars, Zoologisk Reise i Christiania og Thronhjems Stifter, p. 42).—2. *N. serratus* (G. O. Sars, l. c. p. 43).—3. *N. microps*, sp. n.—4. *N. obesus*, sp. n.

DIASTYLIDÆ.

Hr. Boeck describes (Forh. Kelensk. Selsk. Christ. 1864, p. 189) a Crustacean of this family under the name of *Cuma cornuta*, which has a peculiarly characteristic spinous appearance, and is furnished with two large teeth near the anterior portion of the carapace.

This description seems to correspond so closely with the species given by Mr. Spence Bate under the name of *Diastylis bicornis* (Ann. & Mag. Nat. Hist. Feb. 1865, vol. xv. p. 84), that we have little doubt they are synonymous, and consequently must bear the name of *Diastylis cornuta* (Boeck).

AMPHIPODA.

ORCHESTIDÆ.

Prof. Grube has given the description of several amphipod Crustacea (Archiv für Naturg. Band i. p. 201) which he found on the Istrian shores of the Mediterranean Sea. Among these is *Nicea istrica*, which the author says resembles *Allorchestes* except in the following points:—Antennæ breves, subæquales. Gnathopoda subchelati. Telson profunde divisum.

We have little doubt that this species is identical with *Nicea prevostii** of Milne-Edwards, which was found at Naples.

GAMMARIDÆ.

Anonyx filiger, sp. n., Stimpson, Proc. Acad. Nat. Sc. Philad. 1864, p. 157, from Puget Sound; closely allied to *Lysianassa longicornis* (Lucas) †.

Ampelisca pugetica, sp. n., Stimpson, l. c. p. 158, from Puget Sound.

Amphitonotus septemdentatus and *A. occidentalis*, sp. n., Stimpson, l. c., from Puget Sound.

Deramine brevitarsus, according to Prof. Grube's description (l. c. p. 196), bears a general resemblance to *Atylus gibbosus* as figured in the 'British Sessile-eyed Crustacea' (Spence Bate and Westwood); but the absence of the appendage to the mandible, and the close assimilation of the third joint

* *Nicea prevostii*, Cat. Brit. Mus. Amph. Crust. p. 53. *Amphithoe prevostii*, Edwards, Ann. des Sci. Nat. t. xx. p. 378, and 2 ser. t. xiv. pl. 14. f. 11; Hist. des Crust. t. iii. p. 36.

† *L. longicornis* (Lucas, Expl. Sc. Alger. Crust. p. 53), or *L. chausica* (Spence Bate), not *Alibrotus chausicus* (Milne-Edwards).

of the peduncle of the superior antennæ to the first articulus of the flagellum, induce him to place it in the genus *Dexamine*.

Dexamine anisopus ♀, which, from the great variation in the form of the second, third, and fourth pairs of legs on the right and left sides, he considers, since he has seen *D. spiniventris* of Costa, may probably belong to that species.

Dexamine leptonyx ♀ resembles *Amphithoe* (*Dexamine*) *tenuicornis* of Rathke, but is distinguishable from it by a short brush of hair on the second joint of the peduncle of the inferior antennæ.

Gammarus recurvus Prof. Grube states to resemble the subterranean genus *Crangonyx subterraneus* of the 'British Sessile-eyed Crustacea,' but differs from it in having the eye black and the gnathopoda alike and shorter than the pereopoda. The female of the genus *Gammarella* approximates so nearly in form to *Crangonyx*, only having the eye coloured with black pigment, that we have little doubt of the near relationship of Prof. Grube's *Gammarus recurvus* to *Gammarella normani*, which is probably the female of *G. brevicaudata*.

Under the name of *Gammarus subtener* Dr. Stimpson has described (Proc. Acad. Nat. Sci. Philad. 1864, p. 157) a small compressed species of delicate structure from Puget Sound.

Iphimedia multispinis, Prof. Grube (*l. c.* p. 202) says, resembles *I. nodosa* of Dana; but the description and figure show, we think, a closer approximation to *I. eblanæ*, the dorsal carinal teeth being less strong (probably a sexual distinction). *I. multispinis* was dredged in the Bay of Cigale in the Isle of Lussin.

? *Kroyera haplocheles*, sp. n.?, Grube, Insel Lussin, p. 72, from Lussin.

Mæra fusca, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 667, from Esquimalt Harbour, Vancouver's Island.

COROPHIDÆ.

Amphithoe humeralis is a new littoral species from Puget Sound. Stimpson, Proc. Acad. Nat. Sc. Philad. 1864, p. 156.

Colomastix is a new genus, which Prof. Grube (*l. c.* p. 206) states to closely resemble *Cratippus* of the 'British Sessile-eyed Crustacea.' He defines it as follows:—*Pereion* (corpus) subteres, depressum, postice attenuatum, coxis humilibus. *Antennæ* breves, fortes, flagellis maxime obsoletis vel nullis; *superiores* inferioribus vix longiores, flagello secundario nullo. *Stagonopoda tertia* (pedes maxillares) exungues. *Gnathopoda paris* 1^{mi} tenuia, exunguia; 2^{di} fortiora, subchelata. *Pleopoda* omnia biramea, spinulis nullis; ramo paris 3^{ti} exteriore neque uncinato neque uncinis armato. *Telson* simplex, laminare.—*Colomastix pusilla* ♀ (taf. 4. f. 2). The difference, as shown by Prof. Grube, of this species from *Cratippus tenuipes* consists in the form of the first pair of gnathopoda, which in *Colomastix* terminate in several curved spines, whereas in *Cratippus* it is "scarcely subchelate." Even this distinction, as suggested by Prof. Grube, may be only of sexual importance; and we think it insufficient to warrant the formation of a new genus.

Ieridium is a new genus, of which the following description is given by the author (*l. c.* p. 209). *Pereion* depressum, ex ovali oblongum, postice elongatum. *Antennæ* breves, articulis paucis; *inferiores* superioribus breviores, tenuiores. *Cephalon* (deorsum visum) quadrangulum, angulis anterioribus

prominentibus, oculos ferentibus. *Gnathopoda* et *pereiopoda* omnia ambulatoria, longitudine sensim crescentia. *Pleon* ex segmentis 5 compositum. *Pleopoda* anteriorum 4 biramea, setigera; *pleopoda posterioris paris* brevissima, simplicia, esetia. *Telson* nullum.

Iceridium fuscum, Grube (taf. 4. f. 3). There is a slight discrepancy between Prof. Grube's excellent figures and the description. First, the telson is undoubtedly present; and since the ante- and penultimate pairs of pleopoda are attached to one somite, we must rather consider that the two somites are fused into one than that one is wanting. We therefore perceive that one, instead of two somites, only is wanting; but it is contrary to previous observation that this deterioration takes place in the anterior portion of the pleon instead of the posterior; for undoubtedly one of the anterior pairs of pleopoda is the missing pair. Prof. Grube considers this genus very near to *Iceilius*, Dana.

Cerapus latimanus, sp. n., Grube, Insel Lussin, p. 74, from Neresine.

CAPRELLIDÆ.

Caprella kennerlyi, sp. n., Stimpson, Proc. Ac. Nat. Sc. Phil. 1864, p. 156, from Port Townsend.—*Caprella inermis*, sp. n., Grube, Insel Lussin, p. 75, from Lussin piccolo.

ISOPODA.

TANAIDÆ.

Dr. FRITZ MÜLLER (Archiv für Naturg. Band i. p. 1), in describing the structure of the genus *Tanais*, asserts that the cephalon is developed upon the type of the carapace of the Decapoda, that although he has not been enabled to define branchial appendages, yet, since he has observed that a current of water flows anteriorly under the lateral walls as in the higher orders, it undoubtedly fulfils the same office, though probably in a less perfect manner than is the case even in the *Diastylidæ* where rudimentary organs exist. He also describes the internal anatomy as well as the ovisac and external organs of sense. We regret that the limits both of time and space afforded to us preclude our doing justice to the contents of this very interesting communication; but we are compelled to say that our carefully made researches disagree with those of Dr. Müller, and that if any current passes anteriorly, as observed by him, it must pass externally to the lateral walls of the carapace, and not within them. For, in consequence of the large development of the anterior pair of gnathopoda, the lateral walls of the carapace are compressed to so great a degree as to shut out all communication between the posterior and anterior surfaces; independently of which, the branchiæ (being appendages of the pereion) can only exist beneath the carapace where the cephalon is developed to so great an extent as to cover the appendages of the pereion.

Prof. LILLJEBORG, who has done such good service to the study of carcinology, has furnished us with a memoir which is entitled "A Contribution to the knowledge of the Suborder Isopoda of 1864. [VOL. I.]

the coasts of Sweden and Norway, and the family Tanaidæ." It is chiefly on the family of the Tanaidæ and the relation which it holds to that of the order of the Isopoda generally.

The memoir commences with a summary of the previous history, from the period of Montagu's description of *Cancer gammarus talpa* to the present time, including a consideration of Dana's classification of this family, together with other Isopoda in which the three posterior pairs of pereopoda only are directed backwards, into a separate tribe under the name of Anisopoda, and his own reasons for considering them true Isopoda, though differing from the *type*.

Of this genus *Tanais*, in which he includes those of *Leptochelis* (Dana), *Paratanais* (Dana), and *Crossurus* (Rathke), the species are few; and although the geographical range includes both northern and southern hemispheres, there have been but thirteen species recognized; to these, from the shores of Scandinavia, Prof. Lilljeborg has succeeded in adding nine new species, and believes that further research will add yet many more.

He then gives a description of the family, and in the annexed table classifies the order Isopoda so as to show its position; but our own researches and observations preclude us from approving his classification.

Though we cannot agree with Dana in the construction of a new group or tribe of equal importance with the Isopoda and Amphipoda for the purpose of receiving several somewhat abnormal families in some of which there is rather a degradation than an alteration of structure, yet we think that he is correct in placing the Tanaidæ very near to the Amphipoda. That he has placed the Bopyridæ still nearer is an error that cannot vitiate the correctness of his judgment in relation to *Tanais*, of which we have had recent verification in observing that a pair of branchial sacs similar to those found in the Amphipoda are attached to the third pair of pereopoda, thus demonstrating the near affinity of *Tanais* with the true Amphipoda.

ISOPODA.

I. No fin tail.

A. The posterior pair of pleopoda slender and round, and

1. Smaller than the preceding, and not squamiform. 1. ONISCIDÆ.

2. Larger than the preceding; more or less squamiform.

a. (Pleopoda) mostly branchial appendages.

aa. No swimming feet.

2. ASSELLIDÆ.

bb. The three posterior pereopoda formed for swimming.

3. MUNNOPSIDÆ.

b. No branchial appendages. Five anterior pairs formed for swimming.

4. TANAIIDÆ.

- B. The posterior pair of pleopoda formed into a scale-like operculum.
 - 1. The first four pairs of pereopoda formed as ciliated swimming-appendages, without a claw. 5. ARCTURIDÆ.
 - 2. Pereopoda terminating in a claw. 6. IDOTHEIDÆ.
- II. A fin tail. Flat rami to the posterior pleopoda, or with ciliated swimming-appendages.
 - A. With vertical side-rami. 7. ANTHURIDÆ.
 - B. Without side-rami.
 - 1. Generally seven pairs of appendages to the pereion; posterior pair of pleopoda
 - a. With one ramus moveable. 8. SPHEROMIDÆ.
 - b. With both rami moveable.
 - aa. Sexes alike. 9. CYMATHOIDÆ.
 - bb. Sexes very unlike. 10. BOPYRIDÆ.
 - 2. Five or six pairs of appendages to the pereion. 11. ANCEIDÆ.

After explaining his reasons for the above arrangement, he gives a description of the genus *Apseudes* (Leach), and follows it with one of *Apseudes talpa* (Montagu). He then describes the genus *Tanais* (M.-Edwards), and follows it with an enumeration of all the known species, and descriptions in Latin of all the new ones, which he arranges according to the annexed table.

- I. Posterior pair of pleopoda with two rami.
 - A. First pair of hands of common form (subchelate?).
 - 1. Last joint of superior antenna shorter than first.
 - a. Four joints to inner ramus of post. pleopoda. 1. *oerstedii*.
 - b. Two joints to inner ramus of post. pleopoda. 2. *brevicornis*, sp. n.
 - 2. First and last joints of superior antenna of about same length.
 - 3. *tenuimanus*, sp. n.
 - B. First pair of hands chelate; a large opening between the fingers.
 - 4. *forcipatus*, sp. n.
 - C. Hinder outer branch of the last pair of pleopoda two-jointed, and much shorter than the inner ramus.
 - 1. Hands having moveable fingers with the outer edge serrated or crenulated.
 - a. Outer ramus of post. pleopoda hardly half as long as inner.
 - 5. *gracilis*, Kr.
 - b. Outer ramus of post. pleopoda about half as long as inner.
 - 6. *graciloides*, sp. n.
 - 2. Hands having moveable fingers, with the outer edge smooth.
 - 7. *longiremis*, sp. n.
 - D. Hinder outer branch of the last pair of pleopoda two-jointed, and little shorter than the inner ramus.
 - 8. *agiremis*, sp. n.
 - E. Hinder outer branch of the last pair of pleopoda one-jointed.
 - 9. *breviremis*, sp. n.

II. Posterior pair of pleopoda with one branch.

A. Sides of pleon not covered with hair.

1. The post. pair of pleopoda with a long ciliated process; hand with a blunt tooth above the moveable finger. 10. *brevimanus*, sp. n.
2. The post. pair of pleopoda with a much shorter process; hand without tooth. 11. *filiformis*, sp. n.

B. Sides of pleon covered with hair; two bands on pleon.

12. *vittatus*, Rtke.

[*Apsudes*] *Rhæa latifrons*, sp. n., Insel Lussin, p. 75, from Lussin. Undoubtedly *Rhæa* (M.-Edw.) is synonymous with *Apsudes* (Leach), which takes priority.

Tanais loricatus, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 668, from Esquimalt Harbour, Vancouver's Island.

MUNNOPSISÆ (Lilljeborg).

Hr. G. O. Sars says that among the number of new marine Crustacea that he has met with during the previous two years, there are some belonging to the order Isopoda, the structure of which is worthy of notice. The animals are difficult to be detected, from their resemblance to the mud in which they are found at a considerable depth, and consequently have hitherto escaped the observation of naturalists. They were first noticed by the author's father, Prof. Sars (Forhandler i Videnskabs-Selskabet i Christiania for 1860, p. 84), who gave a description of one under the name of *Munnopsis typica*, as belonging to the order Isopoda, and they have been stated by Krøyer to have affinity with the genus *Munna*; but they differ from this genus, as well as from the Isopoda generally, both in their complete want of eyes and in the form and function of the posterior three pairs of pereopoda, which differ from the anterior pairs by being developed into swimming-appendages.

The author says that there are no less than nine species of this form, which may be divided into four genera under the general name of ISOPODA REMIGANTIA, which he thus describes:—

Corpus divisiones ostendit duas plus minusve distinctas, anteriorem capite et segmentis 4 anterioribus pereionis, posteriorem segmentis sequentibus tribus pereionis et pleone compositam. Inter ambas constrictio adest plerumque perspicua. Pleon segmento unico supra convexo constans. Oculi nulli. Antennæ inæquales, superiores vel interiores parvæ in superficie dorsali capitis sitæ supra inferiores, articulo basali magno et laminari, inferiores vel exteriores plerumque valde elongatæ, pedunculo 5-articulato, articulis 3 primis brevissimis, ultimis duobus elongatis, flagello multiarticulato. Maxillipedes laminares partes orales fere omnino obtegentes extus ad basin lamina magna instructæ, 6-articulatæ, articulis ultimis duobus chelam efficientibus plus minusve completam. Pedes primi pariter ceteris plerumque breviores, imperfecte prehensiles; paria sequentia 3 ambulatoria sæpiusque valde elongata. Pedum paria 3 ultima ceteris valde dissimilia, natatoria, articulis plerumque ultimis plus minusve dilatatis et folia-

ceis, setis vel aculeis marginalibus longis ornatis. Pleopodum vel pedum branchiarum 3 paria operculo unico magno obtecta. Uropoda plerumque brevissima sive simplicia sive biramosa. Motus animalis bifarius, sive modo consueto Isopodum gressorius, sive natatorius, pedibus posterioribus pereionis animal velociter retro propellentibus. Ova et embryones in marsupio ventrali laminis magnis ex segmentis 4 anterioribus pleonis prodeuntibus formato inclusa portantur.

1. *Eurycope*. Corpus depressum, supra visum subovatum, antice et postice fere equaliter attenuatum. Cephalon mediocri inter antennis aliquantum productum sæpiusve in processum excurrens rostriformem. Segmenta pereionis 4 anteriora subæqualia, brevissima, supra excavata; 3 posteriora supra convexa, magna, anterioribus non angustiora. Pleon sat magnum, latius quam longius, ad apicem obtuse rotundatum. Antennæ inferiores tenuissimæ et valde elongatæ, corporis longitudinem ter quaterve superantes, flagello pedunculo longiore. Mandibulæ robustæ, ad apicem in dentes 4 divisæ, supra eosdem serie setarum rigidarum et dein processu molari magno et crasso instructæ; palpus mandibularis sat magnus, 3-articulatus, articulo ultimo ad basin incrassato et unguis instar curvato. Pedes primi paris ceteris multo breviores, angustati, articulo ultimo in unguem brevem et crassum transformato; paria sequentia 3 subæqualia, valde elongata, ungue instructa longo terminali. Pedum paria 3 posteriora omnia distincte natatoria; articulo penultimo et antepenultimo valde dilatatis et compressis, setis marginalibus numerosis subtiliter plumosis ornatis; ultimo angustato et styliiformi. Operculum pleonis subpentagonale angulis rotundatis, pleone multo minus. Appendices caudales (uropoda vel posteriora pleopoda) breves, biramosæ, ramis uniarticulatis. Superficies corporis dorsalis lævis nitidaque obscurius quam ventralis colorata. Motus natatorius saltibus efficitur velocissimus.

The species are: 1. *Eurycope cornuta*; 2. *Eu. phalangium*; 3. *Eu. mutica*; all taken between 30 and 60 fathoms in the Gulf of Christiania.

2. *Mesostenus*, g. n. Corpus vix depressum, supra visum subpyriforme, postice attenuatum. Divisio anterior corporis a posteriore constrictione profunda disjuncta, ubique fere ejusdem latitudinis. Cephalon magnum et latum antice truncatum nullum rostrum formans. Segmenta pereionis 4 anteriora brevissima, supra excavata processibus lateralibus antice vergentibus instructa; sequentia 3 magna supra convexa processibus lateralibus destituta; antepenultimum segmentis anterioribus vix angustius, postice profunde emarginatum. Pleon anguste triangulare, apice acuminato. Antennæ superiores breves, flagello pauciarticulato; inferiores corporis longitudinem excedentes, flagello multiarticulato. Mandibulæ breves et robustæ, ad apicem indivisæ, crista instructæ in latere exteriori distincta oblique transversa, processu molari angusto aculeis paucis setiformibus armato; palpo mandibulari sive parvo triarticulato, sive nullo. Pedes primi paris (first pair of gnathopoda) fere ut in genere antecedente; secundi paris ceteris dissimiles et structura plerumque robustiore; paria sequentia 2 subæqualia sæpiusque valde elongata. Pereiopodum posteriorum paria anteriora 2 fere ut in *Eurycope*, articulo imprimis antepenultimo valde dilatato setisque marginalibus subtiliter plumosis ornato, ultimo unguiformi: par ultimum vero antecedentibus dissimile, longum et angustatum articulis vix dilatatis, ungue armatum terminali perlongo et curvato. Operculum pleonis magnum, pleon infra fere omnino obtogens, crista mediana et setis

numerosis marginalibus instructum. Pleopodum par posterius pleoni appressum, simplex, biarticulatum, articulo basali magno et laminari setis instructo marginalibus plumosis. Motus natatorius ut in *Eurycope* saltatorius, velocissimus.

To this genus there are two species:—*Mesostenus longicornis* and *M. hirsutus*. Taken in from 30 to 50 fathoms in the Gulf of Christiania.

3. *Desmosoma*, g. n. Corpus longum et angustatum, segmentis constricti-
onibus plerumque profundis disjunctis. Divisiones ambæ corporis distinctæ. Cephalon parvum, ad basin antennarum utrinque leviter emarginatum, margine frontali aliquantum producto et obtuse rotundato. Segmenta pereionis 4 anteriora brevina et subæqualia, supra vix excavata: posteriora plerumque magna et laminaria. Pleon parvum, ad apicem obtusum. Antennæ prope latera capitis insertæ; superiores parvæ, articulis duobus basalibus ceteris majoribus; inferiores corpore multo breviores, in femina tennes, in mare vero robustissimæ, articulis imprimis flagelli valde incrassatis setisque numerosis brevibus et fasciculatis ornatis. Mandibulæ breves et crassæ, ad apicem in dentes plures divisæ et supra eundem serie setarum sat longarum instructæ; processu molari tenui et laminari, apice obtuse rotundato, pilis subtilissimis dense obsito; palpus mandibularis plerumque adest 3-articulatus, articulo ultimo spina sat longa et unguiformi terminato. Pedes primi parvis ceteris parum breviores sæpiusque structura robustiore, articulo ultimo in unguem sat magnum transformato. Paria sequentia 3 subæqualia, sat brevina et robusta, articulis ad extremitatem aliquantum incrassatis, penultimo et antepenultimo serie duplici spinarum versus basin longitudine decrescentibus armatis, ultimo unguem formante brevem. Paria 3 posteriora antecedentibus longiora, natatoria; articulo basali magno et crasso; penultimo et antepenultimo compressis, parum vero dilatatis, spinis marginalibus longis et compressis minime vero plumosis ornatis; ultimo angustato et styliformi, apice setifero. Operculum pleonis magnum, non carinatum, pilis brevibus marginalibus sparsim obsitum. Pleopodum par posterius simplex, biarticulatum, articulo ultimo majore. Color animalis pallidus. Motus natatorius non ut in generibus antecedentibus saltatorius, sed continuus.

Of this genus there are three species—*Desmosoma lineare*, *D. aculeatum*, and *D. aculeatum*. All taken in the Gulf of Christiania between 15 and 50 fathoms.

4. *Macrostylis*, g. n. Corpus angustatum, postice attenuatum. Cephalon sat magnum, margine frontali inter antennas producto et obtuse rotundato. Segmenta 2 anteriora pereionis brevina, subæqualia; sequentia 2 illis multo majora, præsertim vero segmentum tertium; quartum postice abrupte terminatum, processibus lateralibus armatum acuminatis postice vergentibus; segmenta 3 ultima pereionis subæqualia, constrictionibus et acuminatis. Pleon processibusque instructa lateralibus postice vergentibus et acuminatis. Antennæ superiores magnum, in medio tumefactum, apice obtuse acuminato. Antennæ superiores brevissimæ, articulis paucis versus apicem gradatim decrescentibus compositæ; inferiores sat elongatæ, flagello quam pedunculum breviora. Mandibulæ sitæ; inferiores sat elongatæ, flagello quam pedunculum breviora. Mandibulæ palpo carentes, ad apicem in dentes plures divisæ, processu molari fasciculo densissimo pilorum instructo. Maxillipedum articuli ultimi 2 brevissimi et rudimentares. Pedum paria 2 anteriora (gnathopoda) structura simili, brevina et crassa, ungue instructa terminali sat forti; tertium par antecedentibus multo majus, robustissimum, articulis dilatatis spinisque marginis interioris armatis longis et fortibus, ultimo unguem formante magnum et robustum.

Pedes quarti paris ceteris multo minores et debiliores; articulo ultimo brevi minimeque unguiformi, setis 2 apicalibus instructo. Pedum paria 3 posteriora angustata, posteriora versus longitudine crescentia, articulis vix dilatatis, ultimo setis 2 inæqualibus terminato; eorum structura ad natandum parum apta esse videtur. Operculum pleonis magnum, pleon infra fere omnino obtegens, crista instructum mediana setisque brevibus marginalibus. Pleopodum par posterius perlongum et angustatum, simplex, biarticulatum, articulo ultimo brevi.

Of this genus there is but a single species, *Macrostylis spinifera*.

The structure of the three posterior pairs of pereopoda is often clearly and strongly defined in *Eurycope*, whereas in *Macrostylis* their character as swimming-appendages can hardly be sustained. The general size of this animal is from $1\frac{1}{2}$ mm. to $2\frac{1}{2}$ mm., but specimens of *Eurycope cornuta* have been taken 3 mm. in length.

ASSELLIDÆ.

In this same memoir Hr. G. O. Sars describes also a new genus of Isopoda nearly allied to that of *Munna*, that he thinks the type of a family.

Pleuracantha. Corpus anticum (cephalon et pereion) valde dilatatum et depressum, segmentis 4 anterioribus lateraliter angulatis et spiniferis, posterioribus 3 antecedentibus multo angustioribus, partibus lateralibus obtusis posticeque vergentibus. Cephalon sat parvum, subpentagonale, antice in medio acute productum. Oculi nulli. Pleon segmento unico magno ad basin constricto apice obtuso acuminato constans. Antennæ mediocres, subæquales, valde flexuosæ, pedunculo superiorum bi-, exteriorum 7-articulato. Mandibulæ attenuatæ, apice oblique truncato inque dentes 4 diviso; processu molari omnino nullo; palpus mandibularis minimus, indistincte biarticulatus, dentibus 2 et setis 2 intermediis terminatus. Maxillipedum articuli ultimi 2 elongati, nullam chelam formantes. Pedes primi paris robustissimi, subcheliformes, articulis ultimis valde incrassatis; ungue terminali forti, ad basin dentibus nonnullis validis armato. Pedes sequentes sat longi, omnes structura æquali, posteriora versus parum longitudine crescentes; ungue instructi longo terminali. Operculum pleonis magnum, apice acute productum. Posteriora pleopoda brevissima, parum extra marginem segmenti pleonis prominentia, biramosa, ramis inæqualibus, uniarticulatis.

Of this genus there is one species, *Pleuracantha rubicunda*, sp. n., taken in the Gulf of Christiania in from 10 to 15 fathoms. Its colour is light red, and its length, which is that of a female, about $1\frac{1}{2}$ mm.

Jæra wakishiana, sp. n., Spence Bate, Proc. Zool. Soc. 1864, p. 667, from Esquimalt Harbour, Vancouver's Island.—*Jæra filicornis*, sp. n., Grube, Insel Lussin, p. 75, from Lussin.

SPHEROMIDÆ.

Among the freshwater Crustacea described by Taramelli (Atti della Società Italiana di Scienze Naturali, vol. vi. p. 366) is *Sphæroma fossarum* (Martens), which he has found at Foro Apio. It differs from *S. serratum*, (Fabr.), in colour, in being much less in size, and in having small tubercles on the posterior caudal margin.

Prof. Grube describes the following new species from Lussin (Die Insel Lussin, p. 76): *Sphæroma tridentulum*, *Sph. emarginatum*, *Sph. rubropunctatum*, and *Acherusia* (?) *complanata*.

IDOIDEÆ.

Idothea whitei and *I. urotoma*, Stimpson, Proc. Ac. Nat. Sc. Philad. 1864, p. 155, from Puget Sound.

ÆGIDÆ.

Æga belliceps, Stimpson, Proc. Ac. Nat. Sc. Philad. 1864, p. 155, from Puget Sound.

ANCEIDÆ.

M. HESSE, in a very elaborate memoir first published in the 'Recueil des Savants Étrangers,' and since in a separate volume (Mémoire sur les Pranizes et les Ancées, 4to, 74 pp., Paris, London, New York), has demonstrated that the Crustacea known as *Anceus* and *Praniza* are merely different forms of the same animal. He contends:

"1. That the *Praniza* is but a phase of the metamorphosis of the larva of *Anceus*, which is the perfect state.

"2. That during the period of the larval condition, which is continued for a very considerable time, the differences of the sexes are inappreciable; these crustacea metamorphose themselves into males or females according to their predestination.

"3. That the male and the female are completely distinct in their form, and that they differ so very much between themselves, that it would be difficult to believe that they belong to one and the same species, if they had not been traced throughout their various transformations.

"4. That previously to M. Hesse having described it, the female of *Anceus* was unknown.

"5. That these curious crustacea present this singular peculiarity, that their life is divided into two very distinct periods,—the first, during which they live as parasites, in the state of *Praniza*, upon fish, at which period they are sanguivores, and have the organs of the mouth appropriate to their destiny; the second, in the state of *Anceus*, when, after having quitted the fish, they live in the earth, and then the form of their mouth undergoes a great modification, it appears to consist of lamellous appendages and strong mandibles.

"6. Lastly, that the state of *Anceus* is their latest metamorphosis. The prolonged, probably unprecedented, observations that the author has been able to make on the duration of the life of these crustacea, afford evidences which show it to be of considerable length."

To the first of these clauses M. Hesse has appended a note, in which he says that his discovery was contested almost immediately (Annals and Magazine of Natural History for Sept. 1858) by Mr.

Spence Bate, but that he had been informed that he had since recognized his error.

In the journal alluded to by M. Hesse, Mr. Spence Bate stated that he had taken *Praniza* gravid with young, which young bore a similitude to the adult *Anceus*, and therefore that if M. Hesse had obtained larvæ from *Anceus*, then these two animals must necessarily be both adult females. When he communicated the paper to the 'Annals and Magazine of Natural History,' Mr. Spence Bate little thought that M. Hesse and himself had seen one and the same thing—that *Anceus* (female) of M. Hesse was a *Praniza*; for certain it is that *Praniza* of Montagu is entirely ignored throughout M. Hesse's memoir, and spoken of only as *Anceus* female. The term *Praniza* is used by M. Hesse to designate a larval stage only, which in its earliest form bears no resemblance to Montagu's creature.

M. Hesse was misunderstood in consequence of using a term accepted by carcinologists as belonging to an adult animal* to mean the larva only. All M. Hesse's figures of female *Ancei* will be recognized by every student in this branch of carcinology as representing animals to which Montagu gave the generic name of *Praniza*. The great fact which M. Hesse has discovered and established is that the two animals which most carcinologists placed in distinct families, are but sexual variations of one; but that *Praniza* is the larval form of *Anceus* he has not established, and, moreover, from observation, we most emphatically deny, since side by side we have been enabled to trace from the larva taken from the pouch of *Praniza* a scarcely unbroken series to the forms of the adult *Anceus* and the adult *Praniza*. This we believe M. Hesse has also done†, only erring in assigning the name *Praniza* to the larval condition instead of to the adult female. The error is small, the labour of M. Hesse is great, and his observations original; greater is his labour than appears in this memoir, for of the fifteen plates which accompany his paper only four are published.

The first section of his memoir consists of some preliminary observations relative to his ascertaining the identity of *Praniza* and *Anceus*, in which M. Hesse details a series of experiments that induced him to arrive at the conclusions that he has expressed.

* M. Lucas (Annales de la Société Entomologique de France, 2 sér. tom. vii. p. 466, pl. 15) describes and figures *Praniza obesa* with ova, "On aperçoit les œufs agglomérés entre eux, d'un jaune roussâtre et de forme arrondie."

† Fig. 10. pl. i. of M. Hesse, which is figured as "*Praniza*, Larve du même *Anceus*" (*Praniza*), is undoubtedly a young male; while fig. 11 in the same plate, which is described by the author as *Larve du même*, is as undoubtedly a female. The reader can refer to the respective sizes of the animals as given by the author. We have taken both these forms from the pouch of an adult female.

The second section is on certain particulars concerning *Anceus*, but appears not to bear very materially upon the subject.

The third section is on the metamorphosis that the young undergoes upon its escape from the ovum. The appearance of the eggs in the egg-pouch is so immediately after the last change, that M. Hesse considers that fecundation must have taken place while yet the females were in the larval condition. The *Praniza* or female *Anceus* in its younger stages is more slender, and it assumes the more robust proportions which M. Hesse attributes to the adult stage only in proportion to the development of the impregnated ovum, impregnation probably taking place, as in the higher forms of Crustacea, after the female has cast its exuviae, and previously to the new crust being restored to its natural hardness. The eggs are round, and M. Hesse has found that the period of incubation lasts from twenty to twenty-five days. From the embryonic form he traces the larva until it reaches the condition of a creature independent of its parents.

The fourth section is a description of the young at the period at which it changes into *Anceus*. In this description we take exception to the term *Praniza* being used instead of larva. That some of the larvæ are young *Pranizæ*, no doubt, is correct; but others, again, bear no resemblance to it, so that it is obviously undesirable to make use of the name of Montagu's genus to signify the young, of which there are evidently two distinct forms, the one leading to *Anceus* male, the other to *Anceus* female (*Praniza*). In this section the animal of *Praniza* is described in detail. We do not think that M. Hesse is correct in saying that the cephalon (tête) is distinct from the pereion (corps), being separated by an articulation that serves as a neck. Certainly the first and second segments of the pereion, unless the first be altogether wanting, are fused with the cephalon. We think the description of this section demonstrates the necessity of a clearly defined nomenclature, homologically uniform and correct. M. Hesse in describing the cephalon speaks of the *rostrum*, which, he says, is formed by the oral appendages.

Now, if a rostrum means anything in carcinology, it means the anterior central projection of the carapace to a point; and it is quite clear that the oral appendages, however anteriorly and pointedly produced, can never be described as a rostrum without risking confusion in anatomical description.

Section five is a description of the male *Anceus*, in which there are two points that are novel and interesting: the first is that M. Hesse has observed, in dissecting the oral apparatus, an organ that he thinks may be a sucker; the second, that there is a strong intromittent organ, attached, by the posterior extremity, in the central line of the pereion.

The sixth section is a description of the female *Anceus*, which, we maintain, differs in nothing, in the several specimens figured

by M. Hesse, but in distinctions of a specific value, from Montagu's genus *Praniza*, which Leach many years since supposed to be the female of *Anceus*, and which M. Hesse has now demonstrated to be so.

The seventh section is on the habits and manners of *Anceus*. The eighth is on their food. The ninth section discusses the classification of the genus, in which M. Hesse thinks that *Anceus* should be placed in a section between the Cymathoidæ, with which it has much in common both in form and habits, and the sedentary Isopods or "*Epicarides*," which, like them, are suctorial crustacea.

M. Hesse has enumerated no less than twelve species, without counting two females of which the males are not known to him; of these, all are new to science except one, *Anceus rapax*? These he arranges under four different heads, according to the conformation of the mandibles of the males.

1. Mandibles in the form of pincers, denticulated only at their extremities.
Anceus formica, *Anceus brivatensis*.
2. Mandibles in the form of an axe, the internal border being denticulated.
Anceus asciaferus.
3. Mandibles falciform, with the internal margin entire, but showing the impressions of denticulation; the external margin strengthened with a ridge (bourrelet).
Anceus erythrinus, *Anceus falcarius*, *Anceus manticorus*.
4. Mandibles falciform, with the internal margin denticulated, and without a strong ridge on the external margin.
Anceus trigli, *Anceus scarites*, *Anceus lupi*, *Anceus rapax*, *Anceus verrucosus*, *Anceus surmuleti*.

It is a very remarkable circumstance, that among so many species, all of which are found at Brest, the species so common on the coast of Cornwall and Devon (*Anceus maxillaris*) does not occur.

BOPYRIDÆ.

The name of *Bopyroides* is proposed as a generic name by Dr. Stimpson (Proc. Acad. Nat. Sc. Philad. 1864, p. 156) for those species of this family which resemble the genus *Bopyrus* in form, but possess only rudimentary branchial pleopoda in the female, "being merely fleshy ridges instead of laminae." The species on which he founds the genus was taken on *Hippolyte brevisrostris*, and he names it *Bopyroides acutimarginatus*. He thinks that *Bopyrus hippolytes*, Kröyer, belongs to this genus.

In the Report of the Newcastle meeting of the British Association, published 1864, a new species of *Ione* of Montagu, from Vancouver's Island, was described by Mr. Spence Bate under the name of *Ione cornuta*. It was taken from beneath the carapace of *Callinassa longimana*. The author was also enabled to describe and figure the larva and male. (See also Proc. Zool. Soc. 1864, p. 668.)

In the Annales des Sciences Naturelles (vol. ii. sér. 5. p. 289, and Supplément, p. 325) Prof. Lilljeborg communicates the substance of a memoir that had been previously published by him in the Acta Nova Regiæ Societatis Scien-

tiarum Upsaliensis, vol. iii. 1862.* In this he gives an interesting account of the genus *Liriope* of Rathke, from the first discovery of the parasite by Cavanelli in 1787, who described it under the name of *Oniscus squilliformis*, until the present time; and his reasons for not including the genus in the order of Amphipoda as proposed by Rathke, but placing it in that of Isopoda, as Dana had done, though not in the family of the Tanaidæ as the last author has proposed, but in that of the Bopyridæ. He characterizes the genus, and describes the species *Liriope pygmæa*, Rathke.

ENTOMOSTRACA.

APODIDÆ.

Mr. JOHN LUBBOCK (Trans. Linn. Soc. vol. xxiv. p. 197), among "some new or little-known species of Freshwater Entomostraca," has given a description of *Lepidurus productus*, which he captured in some nearly dried-up pools of stagnant water in a gravel-pit at Pont de l'Arche, near Rouen. This fortunate circumstance has enabled him to describe the hitherto unknown male of this species, which he states may be distinguished from the female in the same manner as that of *Apus cancriformis*. In general form there is no apparent difference; but the eleventh pair of legs, which in the female is specialized into an egg-holder, remains in the male of the usual type. He also discusses, and we think successfully combats, Prof. Dana's hypothesis as to the development of the large number of somites of which the animal consists.

Dr. KLUNZINGER (Zeitschr. für wiss. Zool. Band xiv. p. 139) has given a very full and interesting description of a specimen of *Limnadia* which he found in some slightly brackish pools in the suburbs of Cairo, formed by drainage or percolation of the waters from the Nile through the mud upon its banks.

All the specimens which he took, with but a single exception, were males. The animal in some features coincides with Dana's description of *Cysicus*, especially in the prominent beak-like head; but it has 22 instead of 21 pairs of foliaceous appendages, although Dr. Klunzinger thinks that it is just possible, from the difficulty of counting, that he may have enumerated one pair too many. But in the presence of the protuberance on the dorsal surface it agrees with Brongniart's description of *Limnadia*, although the protuberance is not so large or conspicuous as that figured by Milne-Edwards in his 'Histoire des Crustacés.'

Dr. Klunzinger gives the specific name of *gubernator* to the animal. As the author has some hesitation in fixing the genus to which it belongs, it may be desirable to give a short description of the animal itself.

The sides of the animal are compressed, and the back distinctly segmented. The body is of a brownish-red colour, and enclosed in a bivalve shell that is

oval in shape, greenish grey in colour, fragile, semitransparent, and ribbed. 6 mm. long, 3-4 mm. high.

Head of the animal produced to a pointed beak. Protuberance above the neck. Anterior antennæ long, the anterior margin having thirteen protuberances on which are situated little lancet-like spines, which are most strongly developed near the middle and decrease towards the extremity. The posterior or, as Dr. Klunzinger calls them, the steering antennæ, because by them the animal entirely propels and directs itself through the water (the foliaceous appendages of the body being so feeble that in spite of their motion the animal sinks to the bottom unless the antennæ are in action)—the posterior antennæ are nearly half as long again as the anterior, and consist of a nine-jointed peduncle supporting two flagella, consisting of 13 and 14 articuli, furnished on one side with spines and on the other with closely packed equal-sized hairs. The feet are twenty-two, and foliaceous. The two anterior pairs are subchelate in the male. The back of the animal is armed with spines or hairs, and terminates in two sickle-shaped appendages, which, with the posterior portion of the animal, are capable of being bent anteriorly and inferiorly. The two globular compound eyes are united together by a suture in the median dorsal line. A large chalk-white organ situated in the inferior portion of the beak represents the simple eye.

Dr. Klunzinger remarks that Africa appears to have produced, hitherto, the largest proportion of the species of *Limnadia*.

DAPHNIIDÆ.

The Rev. A. M. Norman, in the sixth volume of the Tyneside Naturalists' Field-club, 1863-64, gives a description of the genus *Acantholeberis* of Lilljeborg (*Acanthocercus*, Schödler), as well as descriptions, with figures, of two species, together with some account of their habits, that are new to Britain, viz. *Ac. curvirostris* (O. F. Müll.) and *Ac. sordida* (Lieven).

Dr. Klunzinger contributes a paper (Zeitschr. wiss. Zool. Band xiv. p. 164) on the anatomy of *Daphnia*, and also a few observations on the freshwater fauna in the neighbourhood of Cairo. The *Daphnia* is *longispina* of Leydig, of which he found only females in some slightly brackish pools on the banks of the Nile. He observes that the parents carried about attached to them the young, after their escape from the ovum, for some time. In his description of the structure of the animal he dwells chiefly upon those parts which have been, he thinks, the least studied by naturalists.

In his searches in the pools in the neighbourhood of Cairo, he found species of *Sida*, *Bosmina*, and four new species of *Daphnia*, which he intends describing; and by their shells he was enabled to make out four kinds of *Cypris*; he also found *Cyclops quadricornis* in the middle of the summer, and *Cyclops castor* in December.

CYPRIDÆ.

Mr. GEORGE BRADY describes several freshwater species new to Britain, among which are four new to science (Ann. & Mag. Nat. Hist. 1864, vol. xiii. p. 59, pls. 3 & 4).

They are *Cypris oblonga*, sp. n., *C. striolata*, sp. n., *C. affinis* (Fischer), *Cau-*

dona virescens, sp. n., *C. albicans*, sp. n., *Cyprides torosa* (Jones). These were all found during the year 1863, in the counties of Northumberland and Durham: one of them (*Cypris affinis*) is a continental species, but has not hitherto been found in England. To the description of these species are appended a few notes on the animal of *Cyprideis torosa* (Jones), and on its occurrence in a recent state, which was first announced by Prof. T. Rupert Jones, in brackish water at Gravesend; it was afterwards found in fresh water by the Rev. A. M. Norman at Sedgfield, and also in brackish water at Weston-super-Mare, as well as at Hartlepool; and by the author at Warkworth: in the two last-named places it was found associated with marine Crustacea (viz. *Palaemon varians*, *Crangon vulgaris*, and *Gammarus locusta*).

CYCLOPIDÆ.

Mr. JOHN LUBBOCK, in a paper in the Linnean Transactions, vol. xxiv. p. 197, describes seven species of the genus *Cyclops*, six of which have been found on the continent, but not previously met with in England, namely, *Cyclops serrulatus*, Fischer, *Cyclops coronatus*, Claus, *Cyclops brevicornis*, Claus, *Cyclops brevicaudatus*, Claus, *Cyclops tenuicornis*, Claus, *Cyclops canthocarpoides*, Fischer. The seventh being new to science, he has named it *Cyclops clausii*.

These were all taken in pools in Kent.

PONTELLIDÆ.

Mr. JOHN LUBBOCK also describes from the same locality and in the same paper two species of *Diaptomus* (Westwood), namely, *Diaptomus westwoodii*, a new species, and *Diaptomus castor*, Jurine.

ARGULIDÆ.

In a full and interesting monograph on this family (Efvers. af k. Vet. Akad. Förh. No. 1, p. 7), Prof. THORELL, after a short notice of the previous observations of others on the subject, says that his opinions on the family of the Argulidæ differ considerably from those of previous writers, and shows in what he considers Kröyer, Gegenbaur, and others to be erroneous. He gives a very full description in Latin, with figures, of *Argulus purpureus* (Risso) and of *Argulus coregoni*, sp. n., and follows with an account of the habits of these parasites, which sometimes, according to Dr. Nystrom, so tease the fish on which they collect that their victim is red with blood.

Prof. Thorell then treats of the affinity of *Argulus* with *Siphonostoma*, *Pæcilopoda*, *Limulus*, *Apus*, &c., and enters into a consideration of their structures. The author states that the parasitic mode of life is generally connected with an increase in the development of the appendages of the mouth, at least in those groups which have an absorbent vessel and an evidently

segmented body. In obedience to this law the *Arguli* have remarkably strong maxillipeds, and in this respect have an affinity with the Branchiopoda.

In the manner of carrying the ova *Argulus* differs from the Copepoda, Caligidæ, and Ascomyzontidæ in wanting both the ovisac and outer spermatophore.

The results of M. Thorell's researches are embraced under the following heads :—

I. *Argulidæ* agree generally with the *Copepoda*, and have certain relations of organization in common with the *Branchiopoda* and *Copepoda*.

1. They have *receptacula seminis*; and,
2. No parthenogenesis appears to occur.

II. They differ from the *Copepoda* in these respects :—

1. Their extremities have not the characteristic form of the *Copepoda*.
2. They have two moveable eyes in front.
3. The integument of the head is protracted into a divided scutum which often covers a great part of the body.
4. The ova are collected neither in an ovisac nor in the matrix when they quit the ovary.
5. Fecundation does not occur within, but without their bodies.
6. The larva quits the egg in a much more developed condition than in the *Copepoda*.

III. But the higher *Siphonostoma* (*Copepoda*) agree with them in certain respects, which all depend upon the parasitic mode of life, such as

1. The depressed form of body.
2. A pair of antennæ attached as fixed organs.
3. The form of the mouth.
4. The great development of the maxillipeds.

IV. They differ from the *Siphonostoma* in these respects :—that,

1. Only one pair of antennæ are fixed organs.
2. Palpi are wanting; and,
3. A spine may be found above the oral siphon.
4. Two pairs of mandibles (Mandelar) may exist within the siphon.
5. The first pair of maxillipeds may have the form of suckers.

V. The ARGULIDÆ are related to the *Branchiopoda*,

1. In the character of their extremities (appendages).
2. Structure of the organs of vision.
3. In general appearance, particularly in the carapace.
4. The want of palpi.
5. Absence of the ovisac.
6. Absence of the external spermatophore.

VI. They approach the *Phyllopoda*,

1. In having the body segmented; and,
2. In having the eyes not united.

- VII. They approach the *Cladocera*,
 1. In the small number of appendages.
 2. In the unsegmented tail (pleon).

VIII. They stand between the *Phyllopoda* and *Cladocera*
 In the manner of development.

- IX. They differ from the *Phyllopoda* and the *Cladocera*,
 1. In being organized for a parasitic life (*vide* III. & IV.).
 2. In their appendages wanting the complete branchial supplement.
 3. In the tail being transformed into a branchial lamina.
 4. In the difference of the generative apparatus, especially as to the
receptacula seminis.
 5. In the external escape of the ovum immediately it leaves the ovary.
 6. In the absence of parthenogenesis.

The consideration of these points leads the author to the conclusion that it is impossible that the *Argulidæ* should be included among the families of the *Copepoda*, but that there are some important points which appear to justify their being classed with the *Branchiopoda*. He considers *Argulus* to be a parasitical *Branchiopod* having some affinity with the *Phyllopoda* and the *Cladocera*, classifying the *Branchiopoda* thus:—

I. *Phyllopoda*. Eyes compound, more or less separated; 10-60 pairs of feet; metamorphosis complete. Free swimmers.

1. *Branchiopodidæ*; 2. *Apodidæ*; 3. *Limnadiidæ*; 4. *Nebaliidæ*.

II. *Cladocera*. Eyes compound, united in one; 4-6 pairs of feet; no metamorphosis. Free swimmers.

1. *Daphniidæ*.

III. *Branchiura*. Eyes compound, separated; 4 pairs of feet; metamorphosis incomplete. Parasitic.

1. *Argulidæ*.

He then gives in Latin a more detailed description of the *Branchiura*, and classifies the species in the following genera:—

Gen. 1. *Argulus*, Müller (1785). Maxillipedes primi paris in adult. cotyledones formantes.

a. Pedes flagello carent. Stimulus ante siphonem adest. Siphon mandibulas et maxillas continet (*Agenor*, Risso).

1. *A. purpureus* (Risso); 2. *A. giganteus* (Lucas).

β. Pedes parium 1ⁱ et 2ⁱ flagello instructi. Stimulus adest. Siphon mandibulas et maxillas continet (*Argulus*, Müller).

3. *A. foliaceus* (Linn.); 4. *A. cöregoni* (Thor.); 5. *A. pugettensis* (Dana); 6. *A. catostomi* (Dana and Herrick).

γ. Pedes parium 1ⁱ et 2ⁱ flagello instructi. Stimulus adest. Siphon mandibulas tantum includit (*Camulus*, Thorell).

7. *A. nattereri*, Hell.

δ. Pedes parium 1ⁱ et 2ⁱ flagello instructi. Stimulus nullus? Siphon?

8. *A. salmini* (Kr.); 9. *A. creomidis* (Kr.); 10. *A. funduli* (Kr.); ? 11. *A. alosæ* (Gould); ? 12. *A. elongatus* (Hell.).

Gen. 2. *Gyropeltis*, Heller (1857). Maxillipedes primi paris apice unco forti armati (cotyledonibus nullis). Pedes parium 1-3ⁱ flagello instructi. Stimulus nullus. Siphon mandibulas tantum includit.

1. *Gyropeltis longicauda* (Hell.); 2. *G. doradis* (Corn.); 3. *G. kollari* (Hell.); ? 4. *G. lacordairei* (Aud.).

Then follow descriptions in Latin of the species of both genera, of which only *A. coregoni* is new, this inhabits most of the lakes of middle and southern Sweden.

CORYCÆIDÆ.

Prof. HÄCKEL (Jena. Zeitschr. Med. und Naturwiss. p. 61) publishes the results of his observations in an elaborate memoir on the *Corycæidæ*, which, with other entomostracous Crustacea and the larvæ of other animals, he found very abundant in the Straits of Messina during the winter of 1859-60.

Among these he was particularly struck with the genus *Sapphirina*, the species of which are remarkable for the beauty of their prismatic hues and for their great transparency. He describes the male, of which Claus had only been able to get females, giving the following characters:—

Body oval, dorso-ventrally strongly compressed, foliaceous, thin, mostly tolerably transparent, coloured with prismatic hues. Pereion formed of five somites, the fifth somite rudimentary and covered by the fourth. The fifth pair of feet consisting of a single-jointed stump (Stummel). The first four pairs of feet with two three-jointed branches. Anterior antennæ formed of 4, 5, or 6 joints; posterior antennæ formed of 4 joints, and furnished with a prehensile hook. The oral appendages consist of sickle-shaped mandibles, squamiform maxillæ, and two pairs of two-jointed footjaws furnished with hooks. The middle single eye bladder-formed; the two side eyes having an extended pigment-mass, which is anteriorly furnished with an oval lens. In the front of the latter is an independent corneal lens. Intestinal canal supplied with hepatic appendages. Caudal appendages short, broad and oval.

He describes *Hyalophyllum* as a new genus, but considers it to be closely allied to *Sapphirinella mediterranea* of Claus. The following is its character:—

Body oval, dorso-ventrally very compressed, and as transparent as a thin film of glass, colourless or but slightly prismatic. Pereion formed of four somites, the fifth somite, together with the fifth pair of feet, wanting. The four existing pairs of feet having two three-jointed branches, on the fourth pair the inner branch is one-jointed. The anterior pair of antennæ consist of 4-6 joints; the posterior pair furnished with a prehensile hook. The mouth is furnished with two pairs of footjaws—one anterior single-jointed with triangular cutting-plates, and one posterior consisting of two joints and armed with a strongly curved prehensile hook. The mandibles and maxillæ are wanting. The two eyes belonging to the pair, and the single central eye, are all in one circular mass of pigment, in which are visible the three lenses—one in front, and two side ones. Intestinal canal without hepatic appendages. Caudal ap-
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pendages very long and narrow, linear. In this genus there are two species, namely *Hyalophyllum pellucidum* and *H. vitreum*.

Prof. Häckel considers that this genus might advantageously be divided into two, or at least two subgenera.

The first he calls *Pyromma*, which consists of *Sapphirina* in its restricted sense. Its character is as follows:—"Eyes either red, yellowish red, or brown. The anterior pair of eyes situated some way within the anterior margin. The two last joints of the posterior antennæ together shorter than the second. Inner branch of the fourth pair of feet well developed and as large as on the other feet." In this subgenus there are three species: *Sapphirina gegenbauri*, *S. edwardsii*, and *S. clausii*. The second subgenus he names *Cyanomma*, or else a second genus *Sapphiridina*; in this there is but one species, namely *Sapphirina darwini* (*Sapphiridina darwini*).

CALIGIDÆ.

Prof. Dr. C. CLAUS (Zeitschr. für wiss. Zool. p. 365) contributes to our knowledge of the parasitic Crustacea (Beiträge zur Kenntniss der Schmarotzerkrebse) in a paper on the organization of *Caligus branchialis*, Malm (*gracilis*, Van Ben.), and *pectoralis*, Müll., which he obtained at Heligoland, as well as others which he took at Nice and Messina. He chiefly treats of the nervous and circulatory systems, and supports the opinion of Pickering and Dana of an anterior and posterior valvular apparatus, but doubts the existence of a central pulsating heart, which Siebold states has been overlooked by the former.

PANDARIDÆ.

Lütkenia, g. n., Claus, Zeitschr. wiss. Zool. 1864, p. 369: Cephalopereione diviso, annulis pereionis secundi et tertii paris inter se coalitis; foliis dorsalibus annuli pereionis quarti duobus mediocribus; annulo genitali lato, postice profunde inciso; cauda haud articulata, oblecta; foliolis caudalibus molliibus, setis brevissimis; pedis primi paris ramis biarticulatis, ramo interno parvulo setis carente, externo in modo maxillipedum valde elongato, setis plumosis nullis; secundi et tertii paris ramis biarticulis, setis plumosis instructis; quarti paris ramis foliaceis, haud articulatis, setis plumosis destitutis (fila ovigera longissima).—*Lütkenia asterodermi*, sp. n. Size of the female 10–11 mm. The male was found also. From the gills of *Asterodermus coryphenoides* (Messina).

NOTODELPHIDÆ.

Prof. CLAUS (Zeitschr. wiss. Zool. 1864, p. 373) treats on Entomostraca dwelling within the cavity of Tunicata, and describes three species of *Bomolochus*: viz. *Bomolochus soleæ* ♀, *Bomolochus cornutus* ♀, and a third form, which he considers to be sufficiently distinct to form a new genus, under the name of *Eucanthus*, the species being *Eu. balistæ*. He then describes a new species under the name of *Sphæronotus thorelli*. He found the specimen in an Ascidian at Naples; but upon comparing it with fig. 1. pl. 2 which Costa published in his Catalogue, he thinks that it undoubtedly belongs to the same genus to which that author has given the name *Notopterophorus*, but without any description. It is about 4–6 mm. in length; it is nearly allied to the genus *Doropygus*, but differs from it in the form of the second, third, and fourth pairs of legs, which are formed of three joints and without hairs.

The first pair of appendages consist of two three-jointed branches on a strong basal joint; the shorter branch terminates in a small hook, the longer in several small points, and may be compared with the form of the feet of *Splanchnotrophus*, described by Hancock and Norman. After these feet the greatest peculiarity is in the form of the body of the female. The central portion, corresponding to the three middle somites of the pereion, rises on the dorsal surface into a globular form much resembling the shell on the back of a snail, beneath which the cephalopereion (Kopfbruststück) and pleon are somewhat compressed on the ventral surface. The large dorsal globular space is filled with a considerable number of ova, which are in a more or less advanced state. Prof. Claus does not consider these crustacea to be true parasites, existing on and sucking the juices of the animal on which they live, but merely occupants similar to the *Pinnotera* which dwell within the shell of bivalve mollusca.

We have not seen Costa's figure, alluded to; but if it resembles at all that given by Prof. Claus, then it cannot belong to *Notopterophorus* as described and figured by M. Hesse in the Ann. Sc. Nat. 1864, i. p. 338, of which we shall have to speak further on.

CHONDRACANTHIDÆ.

Mr. HANCOCK and the Rev. A. M. NORMAN have described (Trans. Linn. Soc. vol. xxiv. p. 49) *Splanchnotrophus*, an entirely new genus of Crustacea, of the family *Chondracanthidæ*. The animals are subinternal parasites, lying buried within the visceral chamber of their victims; but with the caudal extremity and ovigerous sacs of the female exposed on the external surface. The characters of the genus are as follows:

Femina cephalopereion uni- vel bi-annulatum, appendicibus utrinque elongatis, simplicibus, cylindricis instructum. Antennæ primæ minutæ; secundæ majores, prehensiles. Maxillipedes cum mandibulis maxillisque juxta os positi. Pedum pereionum duo paria non natatoria, unguiculata. Pleon biannulatum; annulus posterior appendicibus caudalibus stiligeris confectus. Ova externa, in sacculos ellipticos aggregata. *Mas* perpusillus, a femina cephalopereione quadriannulato, appendicibus lateralibus carente differt.

The authors describe two species, *Splanchnotrophus gracilis*, found on *Doris pilosa*, and *Splanchnotrophus brevipes*, found on *Doto coronata* and *Eolis rufibranchialis*.

M. HESSE, in his third article on rare or new Crustacea of the French coast (Ann. des Sci. Nat. sér. 5. vol. i. p. 333, pl. 11, 12), describes some new species and genera which inhabit the interior of the Ascidians.

Among them is a new species of *Notopterophorus*, to which he has given the name of *Notopterophorus papilio*, a name that is singularly appropriate from the large flat wing-like plates attached to the basal joints of the legs and which spread themselves out on the dorsal surface of the animal.

A new genus, to which he gives the name of *Polycliniophile*, he describes at length from the character of the species *Polycliniophile corisoformis*, from which the following is abbreviated. It is 1 mm. long and $\frac{1}{2}$ mm. broad.

It is divided into many somites, but which are not sufficiently distinct to be counted. The pleon, which is rounded at the extremity, terminates in two large flat lozenge-shaped appendages, above which, upon each side, are perceptible the ovigerous tubes. The cephalon is small, the frontal margin denticulated, the summit ornamented with a trefoil relief and furnished at the base with an ocular point; on each side of the head and under the frontal margin are the antennæ, of which the base is large, striated, flat, and fringed with hairs to the tip; they terminate in a three-articulated flagellum. Beneath and near the frontal margin is the mouth, which is very prominent, conical, terminating in a trumpet-shaped orifice, from which springs a sucker and some small lateral appendages. The pereopoda are four pairs, short, flat, robust, three-jointed, and terminate in a hook. In conformation the mouth and ovigerous tube resemble those of the Siphonostoma. It was found inhabiting *Polychinium constellatum*.

A second new genus he describes under the name of *Botryllophilus*, of which *B. ruber* is taken as the type. It is only 1 mm. long and $\frac{1}{2}$ mm. broad. The sexual difference is considerable. The male has the body cylindrical, with a slight tapering at each extremity. The pleon is separated from the pereion by a strong division. The cephalon is triangular, having an eye in the central front. The antennæ are short and jointed, flat and large at the base, and furnished with short teeth or spines. The pereion consists of four somites of equal size. The pleon consists of five or six somites, and terminates at the caudal extremity in two short pediform appendages armed with three robust hooks. The female has the cephalon very triangular, and very distinct from the pereion, which has a long spinous process on each side of the posterior somite, which appears to protect the ova which are agglomerated together in a sphere beneath it. The pleon is much narrower and consists of six cylindrical somites. It was found inhabiting *Botryllus stellatus*.

A second species, named *Botryllophilus virescens*, M. Hesse describes as differing from the preceding in having six somites to the pereion, and also in colour, with other details.

To a third genus M. Hesse has given the name of *Ichnograde*, and describes it from a single species, *Ichnograde ruber**. It is but 1 mm. in length, and was found inhabiting *Ascidia microcosma*.

A fourth new genus M. Hesse has added to the group under the name of *Podolabis*, of which he has taken *Podolabis fulvus*, sp. n., as the type. This little crustacean is about 4 mm. long and 2 broad. The cephalon is small, and the median eye is protected by a small spine. The pereion is marked by a constriction between each somite, and the pleon consists of only three or four indistinctly defined somites. The pereopoda consist of a biarticulate appendage terminating in a small but powerful prehensile chela. The ova appear to be of moderate size, and occupy all the cavity of the body behind the cephalon. This species was taken in a *Botryllus* attached to *Pecten marinus*.

A second species M. Hesse has named *Podolabis albidus*, from a female specimen found living in a *Polychinium* attached to the feet of *Maia squinado*. The male is unknown.

A fifth genus has been described by this zealous naturalist under the

* By some inadvertency the figures in the plate are named "Plantipode."

name of *Ophioseidus* from a single species which he has named *Ophioseidus cardiocephalus*, which is about 5 mm. long and 2 broad. The cephalon is flat, thin, cordiform, and produced anteriorly to a point, on which is placed the median eye. The pereion is nearly cylindrical and obscurely divided into four or five somites. The pleon is conical and terminates by a narrow prolongation that is furnished with two little round plates bordered with cilia. The pereiopoda resemble somewhat the prehensile appendages of the genus *Ophicotylus* of the Trematodes, and consist of strong prehensile chelæ fixed upon short and stout protuberances. The pleon and pereion posterior to the first somite are filled with ova of a proportionally large size. This species was found in a *Botryllus* attached to a *Maia squinado*. The male is unknown.

With this memoir are given two plates having forty-two figures illustrative of the animals, and the more important parts described in the communication.

KRÖYER, H. N. Contributions to the history of the Parasitic Entomostraca. Naturhistorisk Tidsskrift, Copenhagen, vol. vii. Nos. 2-3, pp. 75-126, 1863-4.

We regret that, up to the time of going to press, the memoir of this author has not been received by us. It is, however, a circumstance of the less consequence, since the June Number of the Annals of Natural History (1865) contains an abstract of it; by this we learn that it contains nearly one hundred new species, illustrated by eighteen plates.

CIRRIPEDIA.

Dr. Ayres states (Proc. Calif. Acad. Nat. Sc. iii. p. 66) that large masses of barnacles were found floating at sea in lat. 33° 8' N., long. 129° 35' W., which, instead of as usual adhering to some piece of timber, were attached to a "spherical fleshy receptacle, apparently a portion of their own system. This receptacle was of a light yellowish colour, about the size of a small orange, which it somewhat resembled in aspect." The cirripedes were allied to *Anatifa* (*Lepas*), but differ from it in the breadth of the dorsal plate, and in the projection of a strong keel at the base of both dorsal and lateral plates.

SUCTORIA.

Prof. LILLJEBORG (Ann. des. Sc. Nat. vol. ii. pp. 289-356), in a communication which he had previously published (Acta Nova Reg. Soc. Scient. Upsal., vol. iii. 1862), describes several species of the genera *Pachybdella*, Diesing [*Sacculina**, Thompson], and *Peltogaster*, Rathke. We think there can be little doubt that the opinion of Lilljeborg is correct, and that they must be considered abnormal forms of the subclass Cirripedia, and related to the order Apoda (Darwin). The author proposes to arrange these Crustaceans as follows:—

* *Sacculina*, Thompson, takes priority of *Pachybdella*, Diesing.

ORDO SUCTORIA.

Genera.

Ova portantur	{	in tubulis ramosis cæciformibus..	{	1st Fam.	{	apertura suctoria, sive ore præ- ditum	<i>Sacculina</i> .
				SACCULINIDÆ.		sine apertura suc- toria.....	
				Corpus subtus			
	{	in sacco simplici magno.	{	2nd Fam.	{	tubulo postico nullo; testes duo	<i>Peltogaster</i> .
				PELTOGASTRIDÆ.		tubulo postico bre- vissimo; testis unus.....	
				Corpus			<i>Apeltes</i> .

SACCULINIDÆ.

Prof. Lilljeborg, *l. c.* pp. 305 & 326, describes *Sacculina carcini*, Rathke, which he found attached to *Carcinus manas* in Bohuslän as well as on the coast of Norway. The Rev. A. M. Norman (Trans. Tyneside Nat. Field Club, 1863-4, p. 185) says that it was dredged off Berwick, attached to the pleon of *Portunus holsatus*.

Clistosaccus is a new genus that the author says has the form of a more or less round and completely closed sac; it was found attached to the pleon of *Pagurus bernhardus*: the following is the description:—

Animal sacciforme, saccum rotundum vel ovale clausum et leve præbens, latere uno (inferiore) in abdomine Paguri immerso, molli et appendicibus ramosis (absorbentibus?) prædito, ibique pallii tunica extima chitinsa cum cute Paguri coalita. Pallio aperto. Corpus parvulum carnosum ovaria interna continens, et tabulis oviferis cæciformibus obtectum videmus.—*Clistosaccus paguri*, sp. n.

The Rev. A. M. Norman records it (Trans. Tyneside Nat. Field Club, 1863-4, p. 185) as having been found on *Pagurus levis*. New to Britain.

PELTOGASTRIDÆ.

The genus *Peltogaster* is divided by Prof. Lilljeborg (*l. c.* p. 316) thus:—

Organum adfigendi sive acetabulum	{	ramosum.....	{	<i>P. paguri</i> , Rathke.
		simplex.		magna, marginata . . . <i>P. sulcatus</i> , sp. n.
		Apertura cor- poris antica		minima, neque mar- ginata <i>P. microstoma</i> .

To these M. Hesse adds, in his fourth communication "On some new or rare Crustacea of the coast of France" (Ann. des Sc. Nat. ser. 5. vol. ii. p. 281), another new species under the name of *Peltogaster tau*, which he found on *Pagurus pubescens* and *P. bernhardus*. The author describes it as being like the letter T, of which the horizontal bar is very long and the up-right leg ("jambage") very short. It appears very nearly to resemble *P. sulcatus* of Lilljeborg. M. Hesse has also had the opportunity of figuring the larval stage of this species.

The Rev. A. M. Norman (Trans. Tyneside Nat. Field Club, 1863-4, p. 185) states that *Peltogaster paguri* (Rathke) is parasitic on the pleon of *Pagurus*

bernhardus off Sunderland, and that *Peltogaster sulcatus* (Lillj.) is gregariously parasitic on the pleon of *Pagurus lævis* off Sunderland. New to Britain.

Prof. Lilljeborg (*l. c.* p. 350) has also described *Apeltes paguri*, g. et sp. n. This nearly resembles in form *Peltogaster paguri*; but it is more elongated, being 11 mm. long and $3\frac{1}{2}$ mm. broad, and differs also in the structure of the part by which it is attached to the *Pagurus*. And near the middle of the inferior surface, upon the *pallium*, exists a large round aperture. The border of the chitinous membrane of the *pallium* surrounding this aperture is a little raised, horny and brown. It is by this border that the parasite is attached to the surface of *Pagurus*.

PYCNOGONIDÆ.

In adding this family to those of Crustacea, we do not consider that we are pledging ourselves beyond identifying it as a link that connects the Crustacea with the Arachnida. Although the result of recent research, both in the structure and development of these animals, tends to place them among the Arachnida, there are some points in their structure that associate them with the Crustacea; this, together with old association, induces us to speak of them in this place for the present.

Mr. HODGE (Trans. Tyneside Nat. Field Club, vol. vi. p. 195, or Ann. & Mag. Nat. Hist. xiii. p. 116) gives a list of the British Pycnogonoidea, with descriptions of several new species. There are twenty-two species in all: that is,

13 species of <i>Nymphon</i> ,	1 species of <i>Pasithoë</i> ,
2 " <i>P. llene</i> ,	1 " <i>Phoxichilus</i> ,
4 " <i>Phoxichilidium</i> ,	1 " <i>Pycnogonum</i> .

To these Mr. Hodge has added ten others, which are contained in the genera *Ammothoa* (a genus not before represented by any British form), *Achelia*, g. n., *Pallene* (*pygmaa*), and *Phoxichilidium* (*virescens*):

Ammothoa brevipes, Hodge, *l. c.* pl. 4. figs. 1-4, and *A. longipes*, Hodge, *l. c.* figs. 5 & 6.

Achelia, g. n., Hodge. This genus is distinguished by the possession of two pairs of palpi, one long and slender, the other short and stout. It may be thus characterized:—Antennæ two-branched, one pair long and slender, eight-jointed; the other pair short and stout, two-jointed, and produced immediately in front of the oculiferous tubercle.

The author describes three species as new: *Achelia echinata*, *A. hispida*, and *A. lævis*; the two last from the south coast of Cornwall, as well as *Phoxichilidium virescens* and *Pallene pygmaa*, a drawing of which was shown by Mr. Spence Bate as far back as 1853 to the meeting of the British Association at Hull, together with the larva of the same. This species has also been found by Mr. Hodge on the coast of Durham.

ARACHNIDA

BY

W. S. DALLAS, F.L.S., M.E.S.

A. Separate Publications.

BLACKWALL, JOHN. A History of the Spiders of Great Britain and Ireland. Part ii. pp. 210, plates 17. London, 1864. Published by the Ray Society.

The second part of Blackwall's British Spiders, published by the Ray Society, completes the most important work on those animals which has appeared for some years. It forms a volume consisting of 384 large 4to pages, and is illustrated with 29 plates, representing the British species of spiders, of the natural size and magnified, with numerous figures of details of structure and of the webs and egg-cocoons of many of the species. The first part, published in 1861, contains an introduction of twelve pages, giving a short description of the anatomical structure of the Araneida, and indicating the terminology employed by the author, and also discussing some general matters in the life-history of the animals, such as the change of skin, the reproduction of lost limbs, the production of the web and formation of the egg-cocoons, and the power of ascending into the air possessed by many species. The work includes the results of Templeton's investigations upon the Irish spiders, the MS. of which has been for many years in the possession of the Ray Society; it contains descriptions of many new species and the synonymy of those previously described. The genera are carefully characterized, but the characters of the families are deficient in precision. The classification adopted will be discussed in a subsequent page.

SIMON, EUGÈNE. Histoire naturelle des Araignées (Aranéides). Paris, 1864, 8vo, pp. 540.

In the absolute dearth of anything like a treatise on the general classification of the Araneida, this work by M. Eugène Simon must be most welcome to naturalists. It contains a

complete revision of the modern genera of spiders with a list of the described species, and full descriptions of the appearance and habits of the best-known species of each genus (European types being selected wherever they occur), and concludes with a synonymic catalogue of the European species of Araneida. The latter is defective in some respects, especially from the fact that the author appears to have been quite unacquainted with Mr. Blackwall's later papers on Araneida in the Annals and Magazine of Natural History, as also with his fine Monograph of the British Spiders published by the Ray Society, although the first part of the latter appeared in 1861. The descriptions are illustrated with numerous woodcuts representing species of the more characteristic genera, and showing the arrangement of the eyes and other parts from which the generic characters are derived.

B. *Papers in Journals.*

* Descriptive.

BLACKWALL, JOHN. Notice of the capture of *Mithras paradoxus* in England. Ann. & Mag. Nat. Hist. 3rd series, vol. xiii. pp. 435, 436, May 1864.

BLACKWALL, JOHN. Descriptions of seven new species of East Indian Spiders received from the Rev. O. P. Cambridge. Ann. & Mag. Nat. Hist. 3rd series, vol. xiv. pp. 36-45, July 1864.

BLACKWALL, JOHN. Notice of Spiders, indigenous to the Salvages, received from the Barão do Castello de Paiva. Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. pp. 174-180, September 1864.

DOUMERC, —. Description de deux Aranéides des genres Thomise et Epeïre, du Sénégal. Ann. Soc. Ent. Fr. 4^e série, tom. iv. pp. 229-232. pl. 5. figs. 1 & 2. October 12, 1864.

ERBER, JOSEF. Beiträge zur Lebensweise der Tarantel. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 717-720. 1864.

FLACH, —. Ueber Pflanzen-Milben und die Mundtheile der Milben. Verhandl. naturh. Ver. preuss. Rheinl. und Westph. 1864, (Sitzungsber.) pp. 11-18.

HODGE, G. British Pycnogonoidea. See p. 311.

JOUAN, H. Additions à la Faune de la Nouvelle Calédonie. Mém. Soc. Imp. Sci. Nat. de Cherbourg, tom. x. p. 304.

KEYSERLING, EUGEN. Beschreibungen neuer und wenig bekannten Arten aus der Familie *Orbitelæ*, Latr., oder *Epeiridæ*, Sund. Sitzungsber. der naturw. Gesellschaft Isis, zu Dresden, Jahrgang 1863, pp. 63-98 and 119-154, plates 1-7. Dresden, 1864.

LUCAS, H. Remarques sur une Arachnide trouvée aux environs de Boghar (Algérie). Ann. Soc. Ent. Fr. 4^e série, tom. iv. p. 206. October 12, 1864.

LUCAS, H. Quelques remarques sur les Aranéides Orbitèles de la Nouvelle-Grenade, de Nossi-Bé, de Malacca, &c. de M. Keyserling. Ibid. pp. 217, 218. October 12, 1864.

** Anatomical and Physiological.

CLAPARÈDE, E. Etudes sur la circulation du sang chez les Araignées du genre *Lycose*. (Investigations on the circulation of the blood in the spiders of the genus *Lycosa*.) Reprinted from Mém. Soc. de Phys. et d'Hist. Nat. de Genève, tome xvii. 1863, in Ann. Sci. Nat. série 5. tome i. pp. 259-274 (Novembre 1864). Translated in Ann. & Mag. Nat. Hist. 3rd ser. vol. xv. pp. 16-28.

KROHN, A. Ueber die männlichen Zeugungsorgane der Afterspinnen. Verh. naturh. Ver. preuss. Rheinl. und Westph. 1864, (Sitzgsber.) pp. 109, 110.

[On the male generative organs of *Phalangium*.]

Vogt (Vorlesungen über nützliche und schädliche, &c., Thiere, pp. 95-106) refers to some injurious and otherwise notorious species of Arachnida, such as the Ticks and Mites, the Tarantula, and the Scorpions, and to the benefits conferred upon man by other forms of this class, such as the ordinary Spiders and Harvest-men.

ARANEIDA.

The primary division of the Araneida into tribes, adopted by Blackwall (History of Spiders of Great Britain and Ireland), is founded upon the number of eyes. The species with eight eyes constitute the tribe *Octonoculina*, which includes by far the greater part of the order; the *Senoculina* include the species with six eyes; and the *Binoculina* those with only two. The last-mentioned tribe is formed solely by the genus *Nops* (M'Leay), of which only a single species is described; the *Senoculina* include the two families *Dysderidæ* and *Scytodidæ* of Blackwall. This character is evidently most artificial, and the mere suppression of a single pair of ocelli out of eight cannot

be regarded as sufficient to warrant the establishment of a family, much less to serve for the primary division of an order. Blackwall, indeed, speaks of its "convenience;" but little can be gained even in this respect when we find that, of 315 species described in the present work, 307 belong to one group and only 8 to the other, whilst the disadvantage of separating *Dysdera* and *Segestria* from the Drassidæ, to which they are manifestly so closely allied, furnishes a strong argument against the adoption of this principle of classification.

The arrangement of the families is as follows:—

Tribe OCTONOCULINA.

- Fam. *Mygalidæ*. (*Atypus*, 1 sp.)
 Fam. *Lycosidæ*. (*Lycosa*, 16 sp.; *Dolomedes*, 3 sp.; *Hecæerge*, 1 sp.; *Sphasus*, 1 sp.: total 21 sp.)
 Fam. *Salticidæ*. (*Eresus*, 1 sp.; *Salticus*, 17 sp.: total 18 sp.)
 Fam. *Thomisidæ*. (*Thomisus*, 19 sp.; *Philodromus*, 9 sp.; *Sparassus*, 1 sp.: total 29 sp.)
 Fam. *Drassidæ*. (*Drassus*, 14 sp.; *Clubiona*, 12 sp.; *Argyroneta*, 1 sp.: total 27 sp.)
 Fam. *Ciniflonidæ*. Spinners 8; tarsi 3-clawed; posterior legs with a calamistrum or curling-apparatus of two parallel rows of short, moveable spines. (*Ciniflo*, 5 sp.; *Ergatis*, 3 sp.; *Veleda*, 1 sp.: total 9 sp.)
 Fam. *Agelenidæ*. (*Agelena*, 9 sp.; *Tegenaria*, 4 sp.; *Cælotus*, 1 sp.; *Textrix*, 1 sp.: total 15 sp.)
 Fam. *Theridiidæ*. (*Theridion*, 27 sp.; *Pholcus*, 1 sp.: total 28 sp.)
 Fam. *Linyphiidæ*. (*Linyphia*, 33 sp.; *Neriène*, 48 sp.; *Walckenaëra*, 33 sp.; *Pachygnatha*, 3 sp.: total 117 sp.)
 Fam. *Epeiridæ*. (*Epeira*, 31 sp.; *Tetragnatha*, 1 sp.: total 32 sp.)

Tribe SENOCULINA.

- Fam. *Dysderidæ*. (*Dysdera*, 3 sp.; *Segestria*, 2 sp.; *Schænobates*, 1 sp.; *Oonops*, 1 sp.: total 7 sp.)
 Fam. *Scytodidæ*. (*Scytodes*, 1 sp.)

Simon's *Histoire naturelle des Araignées* (Paris, 1864) presents a classification differing in many respects from those of his predecessors, agreeing with that of Blackwall in the limits of several of the families, but suppressing others altogether, and departing from it rather widely in the general arrangement.

His classification is as follows:—

- Fam. 1. *Scytodiformes* (*Scytoda*, *Omosita*, *Pholcus*, &c.).
2. *Mygaliformes* (*Mygale*, *Atypus*, *Sphodros*, &c.).
3. *Drassiformes* (*Segestria*, *Filistata*, *Drassus*, *Dysdera*, *Argyroneta*, *Clubiona*, *Anyphaena*, &c.) = *Drassidæ* + *Ciniflonidæ* + *Dysderidæ* (Blackw.).

4. *Theridiformes* (*Clotho*, *Theridion*, *Latrodectus*, *Linyphia*, *Tegenaria*, &c.) = *Theridiidæ* + *Linyphiidæ* + *Agelenidæ* (Blackw.).
5. *Epeiriformes* = *Epeiridæ*.
6. *Salticiformes* = *Salticidæ*.
7. *Lycosiformes* = *Lycosidæ*.
8. *Thomisiformes* = *Thomisidæ*.
9. *Myrmeciformes* (*Myrmecia*, *Chersis*).

Blackwall has contributed to our knowledge of the Arthropod Fauna of the Atlantic islands by a description of five species of spiders found on the Great Salvage, one of that group of small rocky islands situated between Madeira and the Canaries. The species appear to be all undescribed. Blackwall suggests that the ancestors of these spiders were probably introduced into these islands by being carried by currents of air from Africa or the other islands. Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. pp. 174, 175.

Jouan mentions a few of the more striking species of Araneida found in New Caledonia. *Epeira edulis* (Labill.) is eaten by the natives; a species of *Gasteracantha* occurs; a black *Micrommatus* with blood-red spots is regarded as venomous; and a large orbiteous species produces strong yellow webs. Mém. Soc. Imp. Cherb. tom. x. p. 304.

Trimen has observed, in the neighbourhood of Cape Town, a bright yellow spider which frequents the *Senecio pubigerus*, Linn., and presents the closest mimetic resemblance to the flowers of that plant. This spider adheres to the flower-stalks of the *Senecio* by its four hinder legs, extending the two front pairs upwards and laterally, and in this position it cannot be distinguished from a flower seen in profile. Its object in thus placing itself is to capture the butterflies which visit the flowers. According to Bates this spider is a species of *Salticus*. Proc. Ent. Soc. Lond. 1864, p. 29.

Walker has published some remarks on the Araneida of the Channel Islands (Zoologist, 1864, p. 9275). He considers them to belong to two faunas,—an early one, represented by the *Lycosæ*, *Drassæ*, and *Dysderæ*, which are very abundant; and a later one, of comparatively recent introduction, including the *Epeiræ*, *Thomisiæ*, and *Theridionæ*. Walker gives a list of the species found on the different islands.

SCYTODIDÆ.

Blackwall describes and figures *Scytodes thoracica* (Latr.), Hist. Brit. Spiders, p. 380, pl. 29. fig. 272.

MYGALIDÆ.

Simon proposes the new name of *Mygalodonta* for Latreille's genus *Cteniza*; Hist. nat. Araign. p. 75.

Lucas publishes some observations upon the habits of a female specimen of *Mygale bicolor*. Ann. Soc. Ent. Fr. iii. p. 667.

LYCOSIDÆ.

Erber describes the habits of the Tarantula (Verh. zool.-bot. Gesellsch. in

Wien, Bd. xiv. pp. 717-720). He has found that this spider digs its burrow at night only, and that each grain of earth when detached is carried away to some distance from the mouth and there deposited. A complete burrow descended perpendicularly for $7\frac{1}{2}$ inches; from the bottom a nearly horizontal gallery was given off, which terminated in a wider chamber, containing an egg-sac with 286 eggs. In one case the spider in sinking its burrow had come upon a flat stone of considerable size; the burrow was then diverted, carried round the edge of the stone and along its lower surface so as to descend below it in the same line as that of the upper portion. The males do not make any burrows; Erber describes their habits and the stratagems they employ to get at the females, from which he believes not more than two or three out of ten escape with life. The food of the *Tarantula* consists of insects of all orders, and spiders.

Lycosina, g. n., Simon, Hist. nat. Araign. p. 369 = *Aulonia* (Koch): sp. *L. albimana* (Walck.).

Sphasus lepidus, sp. n., Blackwall, Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. p. 36, from the East Indies.

SALTICIDÆ.

Cyrtanota, g. n., E. Simon, Hist. nat. Araign. p. 324, = *Salticus* (Latr.) *ex parte*. Cephalothorax humped, the eyes on an inclined plane; falces large, usually horizontal. Sp. *C. scenica* (Lin.), *C. sanguinolenta* (Lin.), &c. This genus includes eleven of Koch's genera; Latreille's name *Salticus* should have been retained for it rather than for the group of which *S. formicaria* is the type.

Cyrtanota (*Philia*) *rubiginosa*, sp. n., Simon, Hist. nat. Araign. p. 506. France.

THOMISIDÆ.

Phrynoides, g. n., E. Simon, Hist. nat. Araign. p. 437. Allied to *Thomisus*. Abdomen enlarged posteriorly, covered, like the cephalothorax, with irregular tubercles; legs rugose and denticulated, except fourth pair, which is smooth and much shorter than the others, which gradually diminish. Sp. *P. rugosa* (Walck.); *P. foka* (Vinson).

Ozyptila, g. n., E. Simon, l. c. p. 439. Allied to *Thomisus*. Eyes forming a crescent, intermediate ones smaller; lip conical, elongated; falces short, cuneiform; cephalothorax small. Sp. *O. claveata* (Sav.).

New species:—

Thomisus yoloophilus, Doumerc, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 230, pl. 5. fig. 2, from Senegal.—*T. tuberosus*, Blackwall, Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. p. 38, from the East Indies.

Pasithea elegans, Blackw. l. c. p. 39, from the East Indies.

DRASSIDÆ (*Dysderidæ*, Blackw.).

The following known species of this family are described and figured by Blackwall (History of British Spiders, part ii.):—

Dysdera erythrina (Latr.), l. c. p. 370, pl. 28. fig. 266; *D. rubicunda* (Koch), l. c. p. 371, fig. 267; *D. hombergii* (Walck.), l. c. p. 371, fig. 268; *Segestria*

perfidus (Walck.), *l. c.* p. 373, fig. 269; *S. senoculata* (Lin.), *l. c.* p. 374, fig. 270; *Schænobates walkeri* (Blackw.), *l. c.* p. 376; *Oonops pulcher* (Temp.), *l. c.* p. 377, pl. 29. fig. 271.

New species :—

Macaria rufescens, Simon, Hist. nat. Araign. p. 455, from Belgium.

Drassus paicani, Blackwall, Ann. & Mag. Nat. Hist. vol. xiv. p. 175, and *D. bewickii*, Blackw. *l. c.* p. 176, from the Salvages.

Dysdera wollastoni, Blackw. Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. p. 179, from the Salvages.

CINIFLONIDÆ.

Blackwall records the occurrence of *Mithras paradoxus* in Cumberland, and states that it possesses four pairs of spinnerets, and has calamistra on the metatarsi of the posterior legs—characters which indicate its position to be in his family *Ciniflonidæ*, close to the genus *Veleda* (Blackw.). He also gives a revised character of the genus. Ann. & Mag. Nat. Hist. vol. xiii. pp. 435-436.

AGELENIDÆ.

Tegenaria dubia, sp. n., Blackwall, Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. p. 177, from the Salvages.

THERIDIIDÆ.

The following known species are described and figured by Blackwall (History of British Spiders, part ii.):—

Theridion lineatum (Clerck), *l. c.* p. 176, pl. 13. fig. 111; *T. quadripunctatum* (Walck.), *l. c.* p. 177, fig. 112; *T. sisypum* (Walck.), *l. c.* p. 179, fig. 113; *T. tepidariorum* (Koch), *l. c.* p. 180, fig. 114; *T. riparium* (Blackw.), *l. c.* p. 182, fig. 115; *T. nervosum* (Walck.), *l. c.* p. 183, fig. 116; *T. pictum* (Walck.), *l. c.* p. 184, fig. 117; *T. denticulatum* (Walck.), *l. c.* p. 185, fig. 118; *T. simile* (Walck.), *l. c.* p. 187, pl. 14. fig. 119; *T. varians* (Hahn), *l. c.* p. 188, fig. 120; *T. tinctum* (Walck.), *l. c.* p. 190, fig. 121; *T. pulchellum* (Walck.), *l. c.* p. 191, fig. 122; *T. carolinum* (Walck.), *l. c.* p. 192, fig. 123; *T. versutum* (Blackw.), *l. c.* p. 193, fig. 124; *T. pallens* (Blackw.), (= *minimum*, Wider), *l. c.* p. 194, fig. 125; *T. stictum* (Cambridge), *l. c.* p. 196, fig. 126; *T. inornatum* (Cambr.), *l. c.* p. 196, fig. 127; *T. fuscum* (Blackw.), *l. c.* p. 197; *T. albens* (Blackw.), *l. c.* p. 199, fig. 130; *T. guttatum* (Wider), *l. c.* p. 200, fig. 131; *T. flavo-maculatum* (Blackw.), *l. c.* p. 201, fig. 132; *T. angulatum* (Blackw.), *l. c.* p. 202, fig. 133; *T. variegatum* (Walck.), *l. c.* p. 203, fig. 134; *T. signatum* (Walck.), *l. c.* p. 205, fig. 135; *T. filipes* (Blackw.), *l. c.* p. 206, fig. 136; *Pholcus phalangioïdes*, (Walck.), *l. c.* p. 208, pl. 15. fig. 137.

New species :—

Theridion auratum (Temp. MS.), Blackw. Brit. Spiders, p. 198, pl. 14. fig. 128; *T. hæmatostigma* (Temp. MS.), Blackw. ibid., fig. 129. From Ireland.

Theridion —, sp. n.? Blackw. Ann. & Mag. N. H. 3rd ser. vol. xiv. p. 178, from the Salvages.

Micryphantes bipunctatus, Simon, Hist. nat. Araign. p. 473, from Belgium.

LINYPHIIDÆ.

The following known species are described and figured by Blackwall (History of British Spiders, part ii.) :—

Linyphia montana (Clerck), l. c. p. 211, pl. 15. fig. 138; *L. triangularis* (Walck.), l. c. p. 212, fig. 139; *L. marginata* (Blackw.) = *resupina* (Wider), l. c. p. 213, fig. 140; *L. pratensis* (Wider), l. c. p. 215, fig. 141; *L. fuliginea* (Blackw.), l. c. p. 216, fig. 142; *L. rubea* (Blackw.), l. c. p. 217, fig. 143; *L. minuta* (Blackw.) (= *domestica*, Wider), l. c. p. 218, fig. 144; *L. cauta* (Blackw.), l. c. p. 220, fig. 145; *L. virax* (Blackw.), l. c. p. 221, pl. 16. fig. 146; *L. socialis* (Sund.), l. c. p. 222, fig. 147; *L. crypticolens* (Walck.), l. c. p. 224, fig. 148; *L. alticeps* (Sund.), l. c. p. 226, fig. 149; *L. longidens* (Wider), l. c. p. 227, fig. 150; *L. frenata* (Wider), l. c. p. 228, fig. 151; *L. tenuis* (Blackw.), l. c. p. 230, fig. 152; *L. terricola* (Koch), l. c. p. 231, fig. 153; *L. meadii* (Blackw.), l. c. p. 232, fig. 154; *L. claytoniæ* (Blackw.), l. c. p. 233, fig. 155; *L. pulla* (Blackw.), l. c. p. 234, fig. 156; *L. alueris* (Blackw.), l. c. p. 235, pl. 17. fig. 157; *L. ericæa* (Blackw.), l. c. p. 237, fig. 159; *L. insignis* (Blackw.), l. c. p. 238, fig. 160; *L. pernix* (Blackw.), l. c. p. 239; *L. nigella* (Blackw.), l. c. p. 240; *L. albula* (Cambr.), l. c. p. 241, fig. 161; *L. pulchella* (Blackw.), l. c. p. 242; *L. furva* (Blackw.), l. c. p. 243; *L. obscura* (Blackw.), l. c. p. 244, fig. 162; *L. gracilis* (Blackw.), l. c. p. 245, fig. 163; *L. tenella* (Blackw.), l. c. p. 246, fig. 164; *L. circumspecta* (Blackw.), *ibid.*, fig. 165; *L. flavipes* (Blackw.), l. c. p. 247, fig. 166; *Neriene marginata* (Blackw.), l. c. p. 249, fig. 167; *N. bicolor* (Blackw.), l. c. p. 250, fig. 168; *N. rufipes* (Blackw.), l. c. p. 251; *N. livida* (Blackw.), l. c. p. 252, pl. 18. fig. 169; *N. furva* (Blackw.), l. c. p. 253; *N. errans* (Blackw.), *ibid.*, fig. 170; *N. sylvatica* (Blackw.), l. c. p. 254; *N. viaria* (Blackw.), l. c. p. 255, fig. 171; *N. pulla* (Blackw.), l. c. p. 256; *N. gracilis* (Blackw.), *ibid.*, fig. 172; *N. vagans* (Blackw.), l. c. p. 257, fig. 173; *N. dentata* (Wider), l. c. p. 258, fig. 174; *N. affinis* (Blackw.), l. c. p. 259, fig. 175; *N. luthwaitii* (Cambr.), l. c. p. 260, fig. 176; *N. pygmæa* (Blackw.), l. c. p. 261, fig. 177; *N. lugubris* (Blackw.), *ibid.*; *N. saxatilis* (Blackw.), l. c. p. 262; *N. avida* (Blackw.), l. c. p. 263; *N. timida* (Blackw.), *ibid.*; *N. flavipes* (Blackw.), l. c. p. 264, fig. 178; *N. parva* (Blackw.), l. c. p. 265, fig. 179; *N. munda* (Blackw.), *ibid.*, fig. 180; *N. tibialis* (Blackw.), l. c. p. 266; *N. cornuta* (Blackw.), l. c. p. 267, fig. 181; *N. bituberculata* (Wider), l. c. p. 268, fig. 182; *N. apicata* (Blackw.), l. c. p. 269, fig. 183; *N. rubens* (Blackw.), l. c. p. 270, fig. 184; *N. nigra* (Blackw.), l. c. p. 271, fig. 185; *N. graminicola* (Sund.), l. c. p. 272, pl. 19. fig. 186; *N. cornigera* (Blackw.), l. c. p. 273, fig. 187; *N. montana* (Blackw.), l. c. p. 273; *N. longipalpis* (Sund.), l. c. p. 274, fig. 188; *N. fusca* (Blackw.), l. c. p. 275, fig. 189; *N. agrestis* (Blackw.), l. c. p. 276, fig. 190; *N. zigilax* (Blackw.), l. c. p. 277, fig. 191; *N. gibbosa* (Blackw.), l. c. p. 278; *N. tuberosa* (Blackw.), l. c. p. 279, fig. 192; *N. trilineata* (Blackw.), *ibid.*, fig. 193; *N. rubella* (Blackw.) (= *isabellina*, Koch), l. c. p. 281, fig. 194; *N. variegata* (Blackw.), l. c. p. 282, fig. 195; *N. sulcata* (Blackw.), l. c. p. 284; *N. herbi-grada* (Blackw.), l. c. p. 285, fig. 199; *N. abnormis* (Blackw.), l. c. p. 286, fig. 200; *N. rubripes* (Blackw.), l. c. p. 287, fig. 201; *N. dubia* (Blackw.), l. c. p. 288, fig. 202; *Walckenaëra acuminata* (Blackw.) (= *camelinus*, Koch), l. c. p. 289, pl. 20. fig. 203; *W. cuspidata* (Blackw.), l. c. p. 290, fig. 204; *W. monoceros* (Wider), l. c. p. 291, fig. 205; *W. hardii* (Blackw.), l. c. p. 292, fig. 206; *W. unicornis* (Cambr.), l. c. p. 293, fig. 207; *W. obtusa* (Blackw.),

l. c. p. 294, fig. 208; W. fuscipes (Blackw.), *l. c. p. 295, fig. 209; W. punctata* (Blackw.), *l. c. p. 295, fig. 210; W. parallela* (Wider), *l. c. p. 296, fig. 211; W. obscura* (Blackw.), *l. c. p. 297, fig. 212; W. flavipes* (Blackw.), *l. c. p. 298, fig. 213; W. turgida* (Blackw.), *l. c. p. 299, fig. 214; W. atra* (Blackw.), *l. c. p. 300, pl. 21. fig. 215; W. aggeris* (Cambr.), *l. c. p. 301, fig. 216; W. hiemalis* (Blackw.), *l. c. p. 302, fig. 217; W. bifrons* (Blackw.), *ibid., fig. 218; W. bicolor* (Blackw.), *l. c. p. 303; W. parca* (Blackw.), *l. c. p. 304, fig. 219; W. exilis* (Blackw.), *l. c. p. 305, fig. 220; W. depressa* (Blackw.), *l. c. p. 306, fig. 221; W. pratensis* (Blackw.), *ibid., fig. 222; W. humilis* (Blackw.), *l. c. p. 307, fig. 223; W. vafra* (Blackw.), *l. c. p. 308; W. cristata* (Blackw.) (= *Theridion bicornis*, Wider), *l. c. p. 309, fig. 224; W. antica* (Wider), *l. c. p. 310, fig. 225; W. saxicola* (Camb.), *l. c. p. 311, fig. 226; W. pumila* (Blackw.), *l. c. p. 312, fig. 227; W. picina* (Blackw.), *l. c. p. 313, fig. 228; W. fastigata* (Blackw.) (*Ther. acuminatum*, Wider), *l. c. p. 314, pl. 22. fig. 229; W. nemoralis* (Blackw.), *l. c. p. 315, fig. 230; W. ludicra* (Cambr.), *l. c. p. 316, fig. 231; W. frontata* (Blackw.), *l. c. p. 317, fig. 232; Pachygnatha clerckii* (Sund.), *l. c. p. 318, fig. 233; P. listeri* (Sund.), *l. c. p. 320, fig. 234; P. degeerii* (Sund.), *l. c. p. 321, fig. 235.*

New species :—

Linyphia (Æobatus) nasatus (Temp. MS.), Blackw. Brit. Spiders, p. 237, pl. 17. fig. 158, from Ireland.

Neriene pilosa (*Myagrus pilosus*, Temp. MS.), Blackw. *l. c. p. 283, pl. 19. fig. 196; N. pallidula* (*Xenophonius pallidulus*, Temp. MS.), Blackw. *ibid., pl. 19. fig. 197; N. carinata* (*Ceroclus carinatus*, Temp. MS.), Blackw. *l. c. p. 284, pl. 19. fig. 198.*

EPEIRIDÆ.

Count Keyserling (Sitzungsber. Isis, pp. 63-64) gives the following tabular synopsis of the genera of *Epeiridæ* :—

I. Maxillæ as long as broad.

A. Fourth pair of legs longer than any others.

1. Abdomen covered with a hard, horny skin; lateral eyes close together, or at least not more than an eye's breadth apart.

a. Cephalothorax quadrangular, as broad in front as behind; much elevated in front, depressed behind.

a. Back of the abdomen furnished with many little pits at the margin and in the middle . . . *Gasteracantha*, Lat.

β. Back of the abdomen without pits . . . *Eurisoma*, Koch.

b. Cephalothorax oval, narrower and not more elevated in front than behind.

a. Cephalothorax longer than broad; abdomen with spines . . . *Acrosoma*, Perty.

β. Cephalothorax broader than long; abdomen only furnished with tubercles . . . *Cyrtogaster*, n. g.

2. Abdomen covered with a soft skin; lateral eyes as far apart as the anterior middle ones from the posterior . . . *Haplochroma*, n. g.

B. First pair of legs the longest.

a. Posterior lateral eyes much further from the anterior ones than these are from the middle ones . . . *Poltyz*, Koch.

6. Lateral eyes always approximated, usually situated on a common tubercle.

a. Cephalothorax elongated and arched, cephalic portion as long as the posterior *Epeïra*, Walck.

β. Cephalothorax nearly round, flat, and densely clothed with white hairs; cephalic portion much smaller than the posterior
Argyopes, Lav.

II. Maxillæ longer than broad.

a. Metatarsi of the first pair of feet much longer than the tibia and patella together; cephalothorax much more elevated in front than behind; labium longer than broad *Nephila*, Leach.

b. Metatarsi of the first pair of feet at the utmost equal in length to the tibia and patella together; cephalothorax not higher in front than behind; labium not longer than broad . . . *Tetragnatha*, Walck.

In his remarks upon the genera, Keyserling states that he has cancelled several of Koch's genera, such as *Miranda*, *Attea*, *Zilla*, and *Linga*, because, as far as can be made out from the species referred to them, they are founded upon insufficient characters. *Tetragnatha*, Walck., is enlarged by the addition of *Meta*, Koch, except *M. cellulana* and *tigrina*, which are regarded as belonging to the *Theridiidæ*. Of *Gea* and *Galena*, Koch, the author knows nothing. *Uloborus*, Latr., is referred to Blackwall's *Ciniflonidæ*, and *Uloborus walckenaerius*, Latr., is considered by Keyserling to be identical with *Veleda lineata*, Blackw. *Mithras*, Koch, does not belong to the *Epeïridæ*.

Remarks on species previously described:—

Blackwall describes and figures the following known species of this family (History of British Spiders, part ii.) :—

Epeïra quadrata (Fab.), l. c. p. 324, pl. 23. fig. 236; *E. apoclista* (Walck.), l. c. p. 325, fig. 237; *E. sericata* (Koch), l. c. p. 328, fig. 238; *E. patagiata* (Koch), l. c. p. 329, pl. 24. fig. 239; *E. scalaris* (Walck.), l. c. p. 331, fig. 240; *E. signata* (Blackw.), l. c. p. 332; *E. umbratica* (Clerck), l. c. p. 333, fig. 241; *E. agalena* (Walck.), l. c. p. 334, fig. 242; *E. solers* (Walck.), l. c. p. 336, fig. 243; *E. similis* (Blackw.), l. c. p. 337, pl. 25. fig. 244; *E. calophylla* (Walck.), l. c. p. 338, fig. 245; *E. acalypha* (Walck.), l. c. p. 341, fig. 246; *E. curcubitina* (Lin.), l. c. p. 342, fig. 247; *E. bella* (Meade), l. c. p. 343, fig. 248; *E. lutea* (Koch), l. c. p. 345, fig. 249; *E. ornata* (Blackw.), l. c. p. 346; *E. ceropegia* (Walck.), l. c. p. 347, fig. 250; *E. adianta* (Walck.), l. c. p. 348, fig. 251; *E. fusca* (Walck.), l. c. p. 349, pl. 26. fig. 252; *E. antriada* (Walck.), l. c. p. 357, fig. 253; *E. celata* (Blackw.), l. c. p. 353, fig. 254; *E. inclinata* (Sund.), l. c. p. 354, fig. 255; *E. albimacula* (Koch), l. c. p. 355, fig. 256; *E. anthracina* (Koch), l. c. p. 357, fig. 257; *E. diadema* (Lin.), l. c. p. 358, fig. 258; *E. angulata* (Lin.), l. c. p. 360, pl. 27. fig. 259; *E. bicornis* (Walck.), l. c. p. 361, fig. 260; *E. conica* (Pall.), l. c. p. 362, fig. 261; *E. tubulosa* (Walck.), l. c. p. 364, fig. 262; *E. calva* (Blackw.), l. c. p. 365, fig. 263; *E. herii* (Hahn), l. c. p. 366, fig. 264; *Tetragnatha extensa* (Lin.), l. c. p. 367, pl. 28. fig. 265.

The following known species are figured and described by Keyserling (Sitzungsber. der Gesellschaft Isis zu Dresden):—

Acrosoma acutum (Walck.), p. 71, pl. 2. fig. 4; *Acrosoma pungens* (Walck.), p. 72, pl. 2. fig. 5; *Epeira insularis* (Hentz), p. 91, pl. 5. figs. 3–5; *Epeira ectypa* (Walck.), p. 135, pl. 6. figs. 13–16; *Epeira caroli* (Hentz), p. 137, pl. 6. figs. 17–19; *Epeira verrucosa* (Walck.), p. 139, pl. 6. figs. 20, 21; *Epeira stellata* (Hentz), p. 140, pl. 6. figs. 24, 25; *Epeira bifurcata* (Walck.), p. 142, pl. 6. figs. 22, 23.

New genera :—

Nuctobia, E. Simon, Hist. nat. Araign. p. 236 = *Meta*, *Zilla*, and *Gea* (Koch). Eyes unequal, arranged as in *Theridion*; abdomen globular; legs very long and thin. Sp. *N. fusca* (Walck.), &c.

Zois, E. Simon, l. c. p. 247. Allied to *Uloborus*; anterior median eyes nearer to each other than posterior; lip small; maxillæ narrow, gradually dilated. Sp. *Z. caraiba*.

Argyrodes, E. Simon, l. c. p. 253. Allied to *Uloborus*; cephalothorax with a raised point in front on which are four eyes, at the base of this on each side two more eyes; abdomen elevated and conical behind. Sp. *A. zonata* (Walck.), *A. epeirides* (Walck.), &c. The species of this genus were placed with *Linyphia* by Walckenaer; they have been found only in the Island of Réunion, where Vinson observed some of them living parasitically in the webs of some large *Epeiræ* and *Nephilæ*.

New species :—

Gasteracantha. Keyserling describes four new species of this genus, namely :—*Gasteracantha blackwallii*, Sitzungsber. Isis, 1863, p. 65, tab. 1. fig. 1, from Madagascar; *G. westringii*, l. c. p. 66, tab. 1. fig. 2, habitat unknown; *G. thorellii*, l. c. p. 67, tab. 1. fig. 4, from Nossi-bé; *G. mengii*, ibid., tab. 1. fig. 5, from Malacca.

Acrosoma. The following new species are described by Keyserling :—From Bogota, *Acrosoma lucasii*, l. c. p. 68, tab. 2. fig. 1; *A. acutospinum*, l. c. p. 69, tab. 2. fig. 2; *A. brevispinum*, l. c. p. 70, tab. 2. fig. 3; *A. bicolor*, l. c. p. 73, tab. 2. fig. 6; *A. rubicundulum*, l. c. p. 74, tab. 2. fig. 7; *A. elongatum*, l. c. p. 75, tab. 2. fig. 8; *A. crassum*, l. c. p. 78, tab. 2. fig. 11; *A. guerini*, l. c. p. 79, tab. 2. fig. 12. From Mexico, *A. obtusospinum*, l. c. p. 76, tab. 2. fig. 9. From Hayti, *A. flavo-maculatum*, l. c. p. 77, tab. 2. fig. 10.

Cyrtogaster (g. n.) *grubii*, Keyserling, l. c. p. 81, tab. 1. fig. 3, from the Mauritius.

Hapulochrota (g. n.) *caudata*, Keyserling, l. c. p. 82, tab. 3. figs. 6–11, from the Mauritius. Said by Lucas to be identical with *Arachnoura scorpionoides* (Vinson). Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 218.

Poltys kochii, Keyserl. l. c. p. 84, tab. 3. figs. 1–5, from the Mauritius.

Gasteracantha frontata, Blackwall, Ann. & Mag. Nat. Hist. 3rd series, vol. xiv. p. 40, and *G. helva*, Blackw. l. c. p. 42, from the E. Indies.

Epeira. Of this genus numerous new exotic species are described by Keyserling, namely :—From Bogota: *Epeira granadensis*, l. c. p. 86, tab. 4. figs. 7–9; *E. bogotensis*, l. c. p. 88, tab. 4. figs. 1–6; *E. dubia*, l. c. p. 123, tab. 4.

figs. 12, 13; *E. pallidula*, l. c. p. 125, tab. 4. figs. 14-15; *E. variabilis*, l. c. p. 126, tab. 6. figs. 1-4; *E. fusco-vittata*, l. c. p. 129, tab. 6. figs. 7-8; *E. fornicata*, l. c. p. 134, tab. 7. figs. 18-20. From Mexico: *E. salei* (rect. *salléi*), l. c. p. 93, tab. 4. figs. 10-11; *E. oaxacensis*, l. c. p. 121, tab. 5. figs. 15, 16. From N. America: *E. trivittata*, l. c. p. 95, tab. 5. figs. 6-9; *E. hentzi*, l. c. p. 97, tab. 5. figs. 10-11; *E. parvula*, l. c. p. 131, tab. 6. figs. 9-10; *E. crucifera*, l. c. p. 132, tab. 6. figs. 11-12. From the Mauritius: *E. triangula*, (scr. *triangula*), l. c. p. 98, tab. 5. figs. 12-14; *E. amygdalacea*, l. c. p. 128, tab. 6. figs. 5-6.

Epeira armillipes, Doumerc, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 231, pl. 5. fig. 1, from Senegal.

Nephila vittata, Keyserl. l. c. p. 142, tab. 5. figs. 1, 2, from Liberia; *Nephila ornata*, Blackwall, l. c. p. 43, from the E. Indies.

Tetragnatha. Keyserling describes the following new species of this genus from Bogota:—*Tetragnatha bigibbosa*, l. c. p. 144, tab. 7. figs. 1, 2; *T. quinquelineata*, l. c. p. 145, tab. 7. figs. 3-6; *T. tenuipes*, l. c. p. 147, tab. 7. figs. 12-14; *T. ocellata*, l. c. p. 149, tab. 7. figs. 7-9; *T. rubromaculata*, l. c. p. 150, tab. 7. figs. 15-16.

Tetragnatha decorata, Blackwall, l. c. p. 44, from the E. Indies.

Eresus siculus, Lucas, Bull. Soc. Ent. Fr. 1864, p. 28, from Sicily; *E. pulchellus*, Lucas, l. c. p. 29, from Nubia; and *E. albo-marginatus*, Lucas, *ibid.*, from the Senegal.

ACARINA.

Flach (Verh. naturh. Ver. preuss. Rheinl. Sitzungsber. pp. 11-18) gives some preliminary observations on the Acarina which infest plants, and proposes the following arrangement of the Acarina:—

1. Without carapace, neck-process, or mandibular palpi; divided into aquatic and terrestrial species.
2. With a carapace, but with no neck-process or mandibular palpi.
3. With a neck-process, but with no carapace or mandibular palpi.
4. With mandibular palpi.
 - a. With a carapace and neck-process.
 - b. With a carapace and no neck-process.
 - c. Without a carapace, but with a neck-process.
 - d. Without either carapace or neck-process.

TROMBIDIDÆ.

Rhyncholophus? plumipes, sp. n., Lucas, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 206, from Algeria.

ACARIDÆ.

Hypoderas unicolor, sp. n., Frauenfeld, Verh. zool.-bot. Gesellsch. in Wien, Bd. xiv. p. 385. Found in great numbers massed together in a ball, forming a subcutaneous tumour under the wings of a grosbeak.

PODOSOMATA.

Mr. Hodge's memoir on British *Pygnogonoidea* has been mentioned in the Record on Crustacea, p. 311.

MYRIOPODA

BY

W. S. DALLAS, F.L.S., M.E.S.

PETERS, W. Uebersicht der im K. zoologischen Museum befindlichen Myriopoden aus der Familie der *Polydesmi*, so wie Beschreibungen einer neuen Gattung, *Trachyjulus*, der *Juli*, und neuer Arten der Gattung *Siphonophora*. Monatsbericht der Kön. Preuss. Akad. der Wiss. zu Berlin, July 1864, pp. 529-551.

This list contains 79 species of *Polydesmidæ*, of which 37 are described as new. The classification adopted by the author will be indicated below.

PETERS, W. Nachtrag zur Uebersicht der *Polydesmi* des Kön. zoologischen Museums. Monatsber. Kön. Preuss. Akad. der Wiss. zu Berlin, October 1864, pp. 617-627.

STEIN, J. P. E. F. Ueber *Glomeris dalmatina* (Stein). Berliner entom. Zeitschr. 1864, pp. 385, 386.

WOOD, H. C. Descriptions of new species of North American *Polydesmidæ*. Proc. Acad. Nat. Sc. Phil. 1864, January (pp. 6-10).

WOOD, H. C. Descriptions of new species of North American *Julidæ*. Ibid. (pp. 10-16).

WOOD, H. C. Descriptions of new genera and species of North American Myriapoda. Ibid. September (pp. 186, 187).

Vogt (Vorlesungen über nützliche und schädliche Thiere, pp. 91-94) notices some forms of Myriopoda.

POLYDESMIDÆ.

Prof. Peters (Monatsber. Berl. Akad. 1864, pp. 529-547) has given a summary of the species of this family contained in the Royal Zoological Museum of Berlin. His arrangement of the genera and subgenera here illustrated is as follows :—

Genus *Sphæriodesmus*, n. g. (see below).

Oniscodesmus, Gerv.

Cyrtodesmus, Gerv.

Polydesmus, Latr.

Subgenus *Fontaria*, Gray. (*P. virginensis*, Drury.)

Strongylosoma, Brandt.

Section I. *Oxyurus*, Koch (*Leptodesmus*, Sauss.). (*P. dilatatus*, Brdt.)

II. *Strongylosoma*, Brdt., s. s. (*Tropisoma*, Koch) (*P. palipes*, Oliv.)

Subgenus *Rhachidomorpha*, Sauss. (*P. rosaceus*, Brdt.)

Rhacophorus, Koch (*Rhachis*, Sauss.). (*P. schomburgkii*, Erich.)

Cryptodesmus, Peters (l. c. p. 621). (*P. olfersii*, Brdt.)

Polydesmus, Latr., s. s. (*P. complanatus*, Linn.)

Trachelodesmus, Peters (l. c. p. 623).

Scytonotus, Koch. (*P. granulatus*, Say.)

Paradesmus, Pet. (*Paradesmus*, Sauss., ex p.). (*P. piecus*, Brdt.)

Euryurus, Koch (*Paradesmus*, Sauss., ex p.). (*P. erythropygus*, Brdt.)

Odontodesmus, Sauss. (*P. javanus*, Sauss.)

Stenonia, Gray (*Platyrhacus*, Koch). (*P. clathratus*, Gerv.)

Genus *Eurydesmus*, Sauss.

Strongylodesmus, Sauss.

New genera :—

Sphæridesmus, Peters (Monatsber. Berl. Akad. 1864, p. 529). Allied to *Glomeridesmus*, but with the fourth and fifth segments most developed. Type *Glomeridesmus mexicanus*, Sauss.

Cryptodesmus, n. subg., Peters (l. c. p. 621). Allied to *Rhacophorus*, but differing from it by the projecting first segment, which completely conceals the head, and the flattened last segment. Type *Polyd. olfersii*, Brdt.

Trachelodesmus, n. subg., Peters (l. c. p. 623). Neck peculiarly attenuated; legs long; antennæ thin. Sp. *Polyd. arcticollis*, Peters.

New species :—

Oniscodesmus aurantiacus, Peters (l. c. p. 530), from Caraccas; *Oniscodesmus rubriceps*, Peters (l. c. p. 617), from Bogota; *Cyrtodesmus asper*, Peters (l. c. p. 618), from Bogota.

Mr. Wood describes the following species of *Polydesmus* :—

In the subgenus *Fontaria* :—*P. trimaculatus*, from Pennsylvania (Proc. Acad. N. S. Phil. 1864, p. 6); *P. corrugatus*, from Michigan (p. 6); *P. bifidus*, from Georgia (p. 7); *P. crassicutis*, from Mississippi (p. 7).

In the subgenus *Polydesmus* :—*P. hispidipes*, from Illinois (p. 81).

In the subgenus *Stenonia* :—*P. cerasinus*, from Oregon (p. 9).

In the subgenus *Strongylosoma* :—*P. eruca*, from Oregon (p. 9).

In the subgenus *Leptodesmus* :—*P. placidus*, from Michigan (p. 9); *P. floridus*, var. ?, from Michigan (p. 9); *P. haydenianus*, from Oregon (p. 10).

Peters describes the following species of the great genus *Polydesmus* as defined by him :—

In the subgenus *Fontaria* :—*Polydesmus martensii* (l. c. p. 531), from Yokohama.

In the subgenus *Strongylosoma*, section *Oxyurus* :—*Polydesmus acanthurus*

(*l. c.* p. 532), from Veragua; *P. luctuosus* (*ibid.*), from Ceylon; *P. decoratus* (*l. c.* p. 533), from Caraccas; *P. fallax* (*ibid.*), from Brazil; *P. notatus* (*l. c.* p. 534), from Columbia; *P. chloropus* (*l. c.* p. 619), *P. bogotensis* (*ibid.*), *P. serridens* (*ibid.*), and *P. sculptus* (*l. c.* p. 620), from Bogota.

Section *Strongylosoma* s. s.:—*Strongylosoma hartmanni* (*l. c.* p. 534), from Sennaar; *S. nietneri* (*l. c.* p. 535), from Ceylon; *S. luzoniense* (*ibid.*), from Luçon; *S. japonicum* (*ibid.*), from Yokuhama; *S. vermiculare* (*l. c.* p. 536), from Caraccas; *S. glabrum* (*ibid.*), from Columbia.

In the subgenus *Rachidomorpha*:—*P. nodosus* (*l. c.* p. 536), from New Granada; *P. alutaceus* (*l. c.* p. 620), from Bogota.

In the subgenus *Rhacophorus*:—*P. hoffmanni* (*l. c.* p. 537), from Costa Rica.

In the subgenus *Cryptodesmus*:—*P. alatus* (*l. c.* p. 621), from Bogota.

In the subgenus *Polydesmus* s. s.:—*P. ægyptiacus* (*l. c.* p. 537), from Egypt; *P. tenuis* (*l. c.* p. 538), from Berlin; *P. cavernarum* (*ibid.*), from the Adelsberg caves; *P. ehrenbergii* (*ibid.*), from Egypt; *P. lusitanicus* (*ibid.*), from Portugal; *P. mucronatus* (*l. c.* p. 622), *P. angulifer* (*l. c.* p. 623), and *P. funiculus* (*ibid.*), from Bogota.

In the subgenus *Trachelodesmus*:—*P. arcticollis* (*l. c.* p. 539), from Caraccas; *P. constrictus* (*l. c.* p. 624), from Bogota.

In the subgenus *Paradesmus*:—*P. liberiensis* (*l. c.* p. 540), from Liberia; *P. ornatus* (*ibid.*), from Guinea.

In the subgenus *Euryurus*:—*P. erythropus* (*l. c.* p. 541), of unknown origin; *P. ater* (*ibid.*), from Caraccas; *P. tricuspidatus* (*l. c.* p. 542), from Guinea; *P. flavo-marginatus* (*ibid.*), from America?; *P. albocarinatus* (*l. c.* p. 624), *P. funigatus* (*ibid.*), *P. tripunctatus* (*l. c.* p. 625), *P. uncinatus* (*ibid.*), *P. semicinctus* (*ibid.*), *P. areatus* (*ibid.*), *P. hybridus* (*l. c.* p. 626), and *P. tænia* (*ibid.*), from Bogota.

In the subgenus *Odontodesmus*:—*P. moluccensis* (*l. c.* p. 543), from the Moluccas.

In the subgenus *Stenonia*:—*P. python* (*l. c.* p. 543), from Costa Rica; *P. fimbriatus* (*ibid.*), from Veragua; *P. concolor* (*l. c.* p. 544), from Ternate, &c.; *P. dorsalis* (*ibid.*), from Luçon; *P. pilipes* (*ibid.*), from Borneo, &c.; *P. malaccanus* (*l. c.* p. 545), from Singapore; *P. subvittatus* (*ibid.*), from Linga; *P. punctatus* (*ibid.*), from Borneo, &c.; *P. pictus* (*l. c.* p. 546), from Borneo, &c.; *P. scutatus* (*ibid.*), from Pulo Matjan (indicated as probably the type of a new genus, *Acanthodesmus*, characterized by the possession of a spine on the basal joint of the legs); *P. sumatranus* (*l. c.* p. 547), from Sumatra, &c.

JULIDÆ.

Trachijulus, g. n., Peters (Monatsber. Berl. Akad. 1864, p. 547). Allied to *Spirostreptus* and *Spirobolus*, but with the eyes in a simple series and the body with rows of spinose longitudinal keels. Sp. *T. ceylonicus*, Peters (*l. c.* p. 548), from Ceylon.

Mr. Wood describes the following North American species of *Julus*:—

J. venustus (*l. c.* p. 10); *J. pilosiscuta* and *J. oregonensis* (p. 11); *J. immaculatus* and *J. canaliculatus* (p. 12); *J. laqueatus*, *J. milesii*, and *J. cinereifrons* (p. 13); *J. cæruleocinctus*, *J. hortensis*, and *J. virgatus* (p. 14).

Spirobolus spinigerus, sp. n., Wood, p. 15, from Florida; *Sp. uncigerus*, sp. n. (p. 15), and *Sp. angusticeps*, sp. n. (p. 16), from California.

POLYZONIDÆ.

Octoglena, g. n., Wood, l. c. p. 186. Oculi octo, in seriebus duabus simplicibus dispositi. *O. bivirgata*, from Georgia.

SIPHONIZANTIA.

Brachycybe, g. n., Wood, l. c. p. 187. Rostrum acutum, brevissimum, antennis multo brevius. *B. lecontii*, sp. n., from Georgia.

Siphonophora lineata, sp. n., Peters (Monatsber. Berl. Akad. 1864, p. 550), from Venezuela; *Siphonophora luzoniensis*, sp. n., Peters (ibid.), from Luçon.

GLOMERIDÆ.

Stein states (Berl. ent. Zeits. 1864, p. 385) that his *Glomeris dalmatina* is identical with *G. transalpina* (Brandt), distinct from *G. transalpina* (Koch), and identical with a supposed variety of *G. pulchra* figured by Koch. *G. pulchra* (Koch) and *transalpina* (Koch) are distinct species.

INSECTA

BY

W. S. DALLAS, F.L.S., M.E.S.

THE GENERAL SUBJECT.

A. Separate Works.

FRAUENFELD, GEORG VON. Das Vorkommen des Parasitismus im Thier- und Pflanzenreiche. Als Festschrift zur 50-jährigen Jubelfeier der naturforschenden Gesellschaft in Emden. Vienna, 1864, 8vo, pp. 32.

This memoir contains a cursory exposition of the phenomena of parasitism in the animal and vegetable kingdoms, in which Insects of course play an important part. Nevertheless the author excludes from his idea of parasites many animals which we are accustomed to refer to that category; a true parasite, in his conception, is an organism which lives in or upon some other organism and cannot survive the destruction of this individual, except after attaining a certain degree of maturity. In this way a multitude of so-called parasitic insects, as, for instance, the whole of the Mallophaga and true Lice, are excluded, and the term parasite is applied only to those forms in which the dependance of the infesting organism upon that infested by it is of the closest nature. Amongst insects, Frauenfeld cites, as examples of true parasites, the various gall-producing forms of Hymenoptera, Diptera, Coleoptera, &c. as parasitic upon plants; the *Æstridæ* as parasites upon the higher animals; and the *Tachinidæ* and many other forms of Diptera, the *Strepsiptera*, *Meloidæ*, &c. among Coleoptera, and the *Ichneumonidæ* among Hymenoptera as parasitic upon other insects. Of the history of all these forms, and of the relations of parasites to the general system of nature, the author gives an account which, although slight, is highly interesting.

GLASER, L. Naturgeschichte der Insekten mit besonderer Berücksichtigung der bei uns einheimischen. Für die gebildete Jugend höherer Lehranstalten, sowie überhaupt für Naturfreunde. Frankfurt, 1864, pp. 320.

Of the second edition of this book, which the Recorder has

not seen, Kiesenwetter says that it is in every respect worthless, so that it becomes a duty to warn beginners against purchasing it. The author appears to be totally unacquainted with modern entomological literature; his descriptions of families, genera, and species are so unsatisfactory that it would be impossible to determine anything by means of them; he employs an erroneous terminology in many cases, and his species are often incorrectly named. Of the significance of Insects in nature the author has no idea; his conception of Insects is that they are injurious vermin.

B. *Works in progress.*

L'ABEILLE. Mémoires d'Entomologie, par S. A. de Marseul, avec la collaboration de plusieurs membres distingués de la Société Entomologique de France. Tome i. livr. 1-4. 12mo.

This periodical work, which seems to appear at rather irregular intervals, is intended to extend to about 500 pages annually, and to contain descriptions of new species, notes upon known species and genera, and monographic treatises upon genera and other higher groups of insects, by M. de Marseul and the entomologists who have associated themselves with him in its production. Each livraison also contains some bibliographic information, but this is very limited in its extent. The four parts published in 1864 contain monographs of the *Telephorides* and of the genus *Apion*, which will be referred to in their proper places.

C. *Papers published in Journals, &c.*

BRAUER, F. Entomologische Beiträge. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 891-902, 1864.

Contains articles on Diptera and Neuroptera, which see.

CORNELIUS. Ueber die entomologischen Verhältnisse Westphalens. Verh. naturh. Ver. preuss. Rheinl. und Westph. 1864, pp. 54-71 (Correspond.).

The author gives nominal lists of the more remarkable species of Insects found in Westphalia.

DANA, JAMES D. On the Homologies of the Insectean and Crustacean types. Sillim. Amer. Journ., reprinted in Ann. & Mag. Nat. Hist. 3rd ser. vol. xiii. pp. 16-18.

DOEBNER. Zwitter und Missbildungen. Stettiner entom. Zeitung, 1864, pp. 196, 197.

FALLOU, J. Une Semaine à Zermatt. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 17-22. 8 June, 1864.

This paper contains an account of the Insects met with by

the author in an excursion to Zermatt in the beginning of August 1863. The species mentioned are almost all Lepidoptera.

FRAUENFELD, GEORG VON. Besprechung eines seltenen Werkes über Pflanzenauswüchse. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 70-74. 1864.

In this paper the author gives an account of the contents of a work published in 1832 by Hammerschmidt, entitled 'Observationes physiologico-pathologicae de Plantarum gallarum ortu, insectisque excrescentia proferentibus.' This work consists merely of seven lithographic plates, with explanations in MS. Frauenfeld identifies the species of gall-producing insects, which are represented with their galls.

FRAUENFELD, GEORG VON. Zoologische Miscellen. Ibid. pp. 147-158, 379-388, 681-696. 1864.

FRAUENFELD, GEORG VON. Entomologische Fragmente. Ibid. pp. 65-74. 1864.

FRAUENFELD, GEORG VON. Ueber einige Pflanzenverwüster eingesendet von Sr. Durchl. Fürst Colloredo-Mannsfeld. Ibid. pp. 413-416.

GIRARD, MAURICE. Note sur une curieuse adhérence de masses polliniques d'Orchidées aux pièces céphaliques de divers Insectes mellivores. Ann. Soc. Ent. Fr. 4^e série, tome iv. pp. 153, 154. 8 June 1864 (read 23 June, 1863).

The author, who appears to have been quite ignorant of Darwin's work on the Fertilization of Orchids, describes various instances of the pollen-masses of those plants having been found attached to the heads of insects, and especially to the globose eyes of some Longicorn Beetles and Lepidoptera. He ascribes the discovery of the adherence of these pollinia to insects to Von Siebold.

JOUAN, H. Additions à la Faune de la Nouvelle-Calédonie. Mém. de la Soc. Imp. des Sci. Nat. de Cherbourg, tom. x. p. 305.

The entomological portion of this paper relates chiefly to noxious insects. A large blue fly (*Calliphora*, sp.) attacks the sheep, and kills them in a few hours. Cockroaches (*Blatta americana*) are abundant. Fleas are very common, but are said to have been introduced by Europeans. The natives abound with lice. Large locusts, also said to have been introduced from Australia, are often very destructive. An enormous green grasshopper (*Locusta imperialis*, Montrouzier) also occurs. The species of *Geocores* are very numerous.

KALTENBACH, J. H. Die deutschen Phytophagen aus der Classe der Insecten; Fortsetz. Verhandl. naturhist. Vereins preuss. Rheinl. und Westph. 1864, pp. 228-404.

The author gives a list of all the various insects living on each plant found in Germany; the genera of plants are alphabetically arranged, and this year's volume of the journal quoted contains the genera M-P (*Malva* to *Pyrus*). As, according to the plan of this Record, we could give only a fragment of this most useful compilation, we prefer to delay our abstract to next year, when we shall be able to insert it in its integrity. The new species described by Kaltenbach will be mentioned below.

KÜNSTLER, G. A. Beiträge zur Kenntniss der der Land- oder Forstwirthschaft schädlichen Insecten. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 779-784 (1864).

LABOULBÈNE, ALEXANDRE. Observations sur les Insectes tubérivores, avec réfutation de l'erreur qui, attribuant les Truffes à la piqure d'un Insecte, les a fait assimiler aux galles végétaux. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 69-114, pl. 2. June 8, 1864 (read June 10, 1863).

In this paper the author not only describes the various species of insects found in Truffles, but also discusses the nature of those Fungi, with especial reference to a notion which seems to prevail in some parts of France that they are in some way produced by insect-agency. He also gives the characters of the different species of the genus *Tuber* found in France. The insects recorded by the author as occurring, either in the larva or the perfect state, in Truffles are twenty-three in number, namely:—

DIPTERA—*Helomyza lineata*, *H. penicillata*, *H. tuberivora*, *H. pallida*, *H. ustulata*, *H.*, sp. indet., *Curtoneura stabulans*, *Anthomyia canicularis*, *A. blepharopteroides*, *Cheilosia* sp., *Phora pallipes*, and *Sciara ingenua*; COLEOPTERA—*Anisotoma cinnamomea*, *A. ferruginea*, *A. picea*, *Bolboceras gallicum*, *Rhizotrogus solstitialis*, *Phyllopertha horticola*, *Apate capucina*, *Tenebrio* sp., *Homalota* sp., and *Gibbium scotias*; LEPIDOPTERA—*Tinea* sp.? The truly Tuberivorous species appear to be only the Dipterous forms and the three species of *Anisotoma*.

OBERTHUR, CHARLES. Rapport sur l'excursion entomologique provinciale faite dans les montagnes de la Lozère en juillet 1863. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 181-194. 12 October 1864 (read 9 March 1864).

PIFFARD, BERNARD. Reminiscences of an Entomological Excursion up the Demerara River. Entom. Monthly Magazine, vol. i. pp. 79-81 and 104-107.

The insects referred to in this paper are chiefly Lepidoptera; a few Beetles are mentioned, and amongst insects of other orders the Lantern-fly (*Fulgora laternaria*).

SÉLYS-LONGCHAMPS, E. DE. Note sur une Excursion dans l'Entre-Sambre et Meuse. Ann. Soc. Entom. Belg. tom. vii. pp. 47-51.

This note contains lists of the Diurnal Lepidoptera and *Libellulidæ* captured by M. de Sélys-Longchamps in the neighbourhood of Chimay and Mariembourg.

WALSH, B. J. On Phytophagic varieties and Phytophagic species. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 403-430. November 1864.

In this interesting and valuable memoir Walsh calls attention to the bearing upon the hypothesis of the origin of species by evolution of some well-known facts in the history of insects. The circumstance to which he refers is, that whilst many species seem to be exclusively confined to a single food-plant, others are more discursive in their tastes, feeding not only upon one or two nearly allied plants, but often upon plants belonging to widely separated groups; and that correlated with this, if not caused by it, we often find certain differences in the insects, either in the larval or perfect state. When these different forms interbreed, they may be regarded as belonging to the same species, and are then called by the author *Phytophagic varieties*; these if isolated, owing to only one species of the food-plants of their species being accessible to them, may become *Phytophagic races*; and these, again, by the continuance of their condition of segregation, may originate *Phytophagic species*, which would be either averse to, or incapable of, interbreeding. The production of such varieties and species will be most common in those Phytophagous forms of which the imago is destitute of wings, or has but little power of flight: as examples the author cites *Cynips* and its allies, *Cecidomyia*, *Aphis*, *Coccus*, and *Tingis*. Of the latter genus he describes two new (Phytophagic) species, and of the Orthopterous genus *Diapheromera*, a new species allied to *D. femorata*. His remarks upon species and varieties refer to *Halesidota* (*Lophocampa*) *antiphola* (Walsh), *H. (L.) tessellaris* (Smith), *H. (L.) caryæ* (Harris), *Clytus pictus* (Drury), *C. robinia* (Forst.), *Sphingicampa distigma* (Walsh), and *Dryocampa bicolor* (Harris), *Bombyx mori*, *Haltica alternata* (Ill.), *Datana ministra* (Drury), *Chrysomela scalaris* (Lec.), *Cynips q. spongifica* (O. S.), *C. q. inanis* (O. S.), *C. q. punctata* (Bassett), *C. q. podagræ* (Walsh). In this memoir Walsh has opened up to entomologists a course of investigation which may lead to most important results, but which must be pursued with the greatest caution.

WALSH, B. J. On certain Entomological Speculations of the New England School of Naturalists. Proc. Entom. Soc. Philad. vol. iii. pp. 207-249. August and September 1864.

In this memoir Walsh discusses certain statements, chiefly made by Professor Agassiz, upon questions relating to general entomology. I. Agassiz has made the rather incautious assertion, in his book on Lake Superior, that the insects of the temperate zone of North America "differ specifically throughout" from those of Europe. Walsh indicates that this statement is negatived even by Leconte's catalogue of insects, published in the above-mentioned work, which contains several species regarded as common to both continents. In further support of the identity of many European and North American species, Walsh has prepared a list systematically arranged (p. 211 *et seq.*), which shows no fewer than 304 species regarded as identical with European forms, the majority belonging to the orders Coleoptera (50), Lepidoptera (57), and Diptera (165). Besides these there are 56 species so nearly allied to European forms that their distinctness is very doubtful. Starting from these facts, Walsh discusses the distribution of insects in North America in opposition to the views of Agassiz, and in support of the Darwinian theory. II. The second section of the paper is devoted to a discussion of the Darwinian theory of the origin of species; and in it Walsh endeavours to show that Agassiz has never carefully read Darwin's book, and certainly proves that if he did read it he did not understand it, and that in his work on 'Methods of Study' Darwin's views are completely misstated. This section contains some remarks on variation in several species of insects. III. In the third section Walsh considers the assertion of Agassiz, that all insects pass through a worm-like larva stage, and maintains that in those cases where the embryo of an insect with imperfect metamorphosis seems to pass through a worm-like stage in the egg, this is not homologous with the worm-like larval state of the Lepidoptera, Diptera, &c. Walsh regards this as a vague analogy, and applies the same term with equal justice, in his Section IV., to the fanciful resemblances traced by Agassiz between the pupæ of insects and the Crustacea. V. In a fifth section the author urges the phenomena of retrograde metamorphosis in opposition to the assertion of Agassiz that "the earliest condition of an animal cannot be its highest condition," and indicates that the determination of the relative superiority of the different orders of insects cannot be arrived at by the consideration of any one character, but by a review of all the characters of each order. Section VI. is devoted to a consideration of Dana's system of insects, founded on what he calls the principle of cephalization, and to an indication of many of the defects of that fanciful arrangement; and Section VII. to an exposition of several erroneous statements and generalizations made by Dana in his paper on Classification.

D. Anatomical and Physiological Papers.

BAUDELLOT, E. De l'influence du système nerveux sur la respiration des Insectes. *Comptes Rendus de l'Acad. des Sciences*, June 1864, p. 1161; *Ann. Sci. Nat. sér. 5. tom. i.* pp. 45-48. (*Transl. Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv.* pp. 280-283.)

MULDER, CL. Een Woord over het Spinnen en de Spintuigen der Insekten. (A word on the spinning and spinning-tubes of insects.) *Tijdschrift voor Entomologie*, vii. Deel, pp. 111-128, pl. vii. Haarlem, 1864.

Frauenfeld (*Verh. zool.-bot. Ges. in Wien*, Bd. xiv. pp. 383, 384) describes the occurrence of peculiar supposed eggs of some species of insect found attached to the frond of an Australian fern (*Asplenium*, sp.). From their characters, Frauenfeld thinks they must belong to some Orthopterous insect.

The same author reports on some insects destructive to plants, sent to him by Prince Colloredo-Mannsfeld (*Verh. zool.-bot. Ges. in Wien*, Bd. xiv. pp. 413-416). The larvæ sent are the wireworm, the larva of a *Silpha* (the injurious character of which is doubted by Frauenfeld), both said to infest beetroot, and the former to have lately attacked the maize. A third species is *Chlorops strigula* (Fab.). Frauenfeld has some remarks upon other injurious Dipterous insects.

Künstler (*Verh. zool.-bot. Ges. in Wien*, Bd. xiv. pp. 779-784) describes the ravages of several injurious species of insects, in continuation of former communications. The insects here referred to are—*Cecidomyia destructor* (Say), *Chlorops strigula* (Fab.), *Anthomyia radicum* (Linn.), *Bostrichus curvidens* (Germ.), *Cryphalus abietis* (Rtzb.), *Xyloterus lineatus* (Gyll.), *Balaninus turbatus* (Schönh.), *Luperus costulatus* (Schauf. MS.), *Anomala vitis* (Duft.), and *Simaethis nemorana* (Hüb.).

Loew (*Berl. ent. Zeits.* 1864, pp. i-x) has published an elaborate report on the viviparous larvæ observed within the last four years. The larva discovered by Wagner he regards as belonging to the family *Cecidomyiidae*; Wagner has since obtained the perfect insect and observed its sexual reproduction, as stated to the Academy of St. Petersburg by Von Baer, but the details of his observations have not yet reached this country. Meinert, however, has discovered a viviparous larva very similar to Wagner's, and described it and its perfect insect in Kröyer's 'Tidsskrift,' vol. iii., under the name of *Miastor metralogs*. The insect belongs to the family *Cecidomyiidae*, but presents (according to Meinert's description) several highly exceptional characters, such as two-jointed palpi and four-jointed tarsi; Loew suggests that a careful examination may perhaps prove that there is some error in this. He thinks the genus will be most nearly allied to *Spaniocera*. Loew also refers to the viviparous larvæ discovered by Pagenstecher in the decaying refuse

of a beetroot-sugar factory, and described by him in Siebold and Köl liker's 'Zeitschrift,' vol. xiv., which are also nearly related to Wagner's and Meinert's larvæ.

This subject is also reported on by Herrich-Schäffer, Corresp.-Blatt. Zool.-mineral. Ver. in Regensburg, Jahrg. 18, p. 119.

Wagner's paper is translated in Nat. Hist. Review, 1864, pp. 226-229.

A. R. WALLACE has communicated to the Entomological Society of London (Proc. Ent. Soc. 1864, p. 15) some observations on polymorphism as exhibited in certain species of Butterflies. After distinguishing between polymorphism and simple variation, he indicated the occurrence of "dimorphism" in *Papilio memnon* (which has two forms of females, both different from the male), and probably of "trimorphism" in *Papilio pammon*, one female of which resembles the male, a second has been described as *P. polytes*, and *P. romulus* appears to be a third. *P. armenus* has three distinct forms of females, all differing from the males; and in some cases the number of female forms appears to be four.

A. R. WALLACE also communicated to the same Society (Proc. Ent. Soc. 1864, p. 21) some remarks on the effect of locality in producing change of form in insects, illustrated by species of *Papilio*, *Eronia*, and *Pieris* from Celebes and the neighbouring islands. He noticed that the Butterflies inhabiting the eastern half of the Indian archipelago, and especially those of Celebes and Amboyna, were generally larger than those in the western half; many of the species from Celebes had the costa of the anterior wings more arched than their nearest allies from the neighbouring islands; and some species, which in India have large tails to the hind wings, gradually lose these appendages as they are traced eastwards. *Papilio agamemnon* is an example of this. Wallace regards these facts, especially the falcation of the wings in the *Papiliones* and some other Butterflies of Celebes, as indicating that in former times these insects were subject to some great persecution, which the curvature of the wings would give them a better opportunity of escaping by facilitating a rapidly tortuous flight: thus, by "natural selection," the individuals with falcate wings would gradually predominate. The facts brought forward by Wallace, and his deductions from them, were discussed by the members of the Society (see Proc. Ent. Soc. l. c. pp. 22 & 23).

Bellier de la Chavignerie gives some account of the results of his entomological expedition to Corsica, and mentions several of the insects (chiefly Lepidoptera and Coleoptera) which he has taken in that island. Bull. Soc. Ent. Fr. 1863, p. xlix.

Emmanuel Martin has given a description of the entomological phenomena of winter at Hyères, in Bull. Soc. Ent. Fr. 1864, p. vi.

Doebner (Stett. ent. Zeit. 1864, p. 196) describes a perfect hermaphrodite of *Saturnia carpin*, in which the right side is entirely male, the left female. He also describes a female *Lucanus cervus*, with male mandibles, and examples of monstrosity in a male *Lucanus cervus* and in *Pentodon punctatus*.

A popular natural history of the more prominent species of injurious and beneficial insects is given by Vogt in his 'Vorlesungen über nützliche und schädliche, verkannte und verläumdete Thiere,' Leipzig, 1864, pp. 106-239.

COLEOPTERA.

A. *Separate Publications.*

BALY, J. S. Descriptions of new genera and species of *Phytopyaga*. 8vo, pp. 16. London, 19th April, 1864.

THOMSON, JAMES. Systema Cerambycidarum ou exposé de tous les genres compris dans la famille des Cérambycides et familles limitrophes. Liège, Paris, &c., 1864, pp. 352, 8vo.

This important work, which forms a complete synopsis of the genera of Longicorn Beetles, is unfortunately disfigured by the excessive prominence of two of the great evils of modern zoology, namely, the multiplication of genera and the adoption of an immense number of higher groups of subordinate value. With regard to the former of these practices, of course there is much to be said on both sides; the establishment of genera must be left to the discretion of individual writers; what appears to one author to be a very distinctly marked genus, is regarded by another as insufficiently characterized, whilst a third may consider it capable of being split up into several groups. The last-mentioned opinion seems to prevail very generally amongst naturalists with regard to existing genera; every slight difficulty experienced in referring a new species to a known genus gives rise to the establishment of a new generic group, or to the splitting up of the old ones, until in many groups we are rapidly approaching the condition of having a distinct genus for almost every species. Without charging M. Thomson with going quite to this length, it will be evident that he is doing his share towards the attainment of so undesirable a consummation when we find the number of genera of Cerambycidae admitted by him into his list amounting to 1085, a number exceeding that of the genera adopted by Lacordaire in the far more extensive, and at least equally difficult, group of the Curculionidæ.

The second error into which M. Thomson has fallen, namely that of unduly multiplying the number of his subordinate groups, is one which must materially diminish the usefulness of his work. It is as if the work were tabulated throughout, but with names given to each ramification of the table down to the fifth or sixth degree; and the resulting complexity may be easily imagined. Thus the family Cerambycidae is divided into two

legions, and these into five *tribes*, and under these tribes we find a descending series of *sections*, *subtribes*, *groups*, *subgroups*, *divisions*, and sometimes *subdivisions*, with occasionally a *cohort* introduced between the subtribe and the group; and as each of these groups is furnished with a name terminating in *-itæ*, a most perplexing labyrinth of nomenclature is produced. Not content with increasing the difficulties of the student by using the same termination for groups of all degrees of importance, M. Thomson actually employs the same denomination for three or four groups of successively diminishing value. Thus we find the typical lower section of a group distinguished by the name of the higher group, with the addition of the adjective *veræ*; and in this way we get no less than four groups, all of which, according to M. Thomson, are the true *Lamitæ*, *Cerambycitæ*, or *Prionitæ* respectively. It is needless to point out the inconveniences attending such a loose method of nomenclature; one would have thought that they were sufficiently evident to have restrained the author from adopting it. This work is not quite completed in the numbers published in 1864, the tabular synopsis of the inferior groups and genera being unfinished.

The groups referred to by M. Thomson as "*familles limitrophes*" of the *Cerambycidae* include the genera *Thaumasus*, *Erichsonia*, and *Parandra* (which are usually regarded as aberrant members of the *Prionides*), and *Trictenotoma*, *Anoploderma*, *Hypocephalus*, and their allies, the true affinities of which are more doubtful. Each of these genera, according to M. Thomson, forms the type of a small distinct family.

WOLLASTON, T. V. A Catalogue of the Coleopterous Insects from the Canaries in the Collection of the British Museum. 1864, 8vo, pp. 648. (Published by order of the Trustees.)

Mr. Wollaston has followed up his thorough investigation of the Coleoptera of the Madeiran group of islands with an equally exhaustive search after insects of the same order in the Canaries; and the result of his investigations has been the deposition of a nearly complete collection of Canarian Beetles in the Insect-room of the British Museum, and the publication of the catalogue of which the title is given above. Although not so magnificent a work as his fine volume on the Coleoptera of Madeira, it displays the same pains-taking desire for the accurate determination of the species, and the same care in description and in the bringing together of the synonymy, which is characteristic of all Mr. Wollaston's work. In this respect, as indeed in all others, Mr. Wollaston's Catalogue presents a striking contrast to the far more pretentious treatise on the Canarian Coleoptera, prepared by M. Brullé for the *Hist. Nat. des îles Canaries*, 1864. [VOL. I.]

ries of MM. Webb and Berthelot, which is fully deserving of the strong censure passed upon it by the author in his introductory remarks (p. viii). The number of species brought together by Webb and Berthelot was only 179, and of these several did not belong to the Canarian fauna; the researches of Mr. Wollaston, Dr. Crotch, and Mr. Gray, with some slight assistance from other observers, have brought up the number of Canarian species of Coleoptera to 930, and out of this large number Mr. Wollaston states that only 77 have escaped his own personal observation. Mr. Wollaston believes that his list is by no means complete, and that many more species will reward the researches of future observers. Of the distribution of the species in the seven islands composing the Canarian group, the author gives a table at the end of his catalogue. Its results are summed up as follows (Intr. Rem. p. x) :—

Lanzarote . . .	277	Gomera	222
Fuerteventura . .	261	Palma	254
Grand Canary . .	325	Hierro	165
Teneriffe	539		

The Coleopterous fauna of the Canaries appears to be less numerous in species, in proportion to their area, than that of the Madeiran islands, the latter group numbering 660 species*. The number of species known to be common to the two groups of islands is only 224. The numerical proportions of the main sections in the classification are nearly the same in both groups, the Rhynchophora being the most numerous represented, next to these the Brachelytra, whilst the Longicornia and Hydradephaga occupy the opposite extremity of the scale. The two eastern islands, Lanzarote and Fuerteventura, possess more of an African element than the others; but on the whole the Canarian Coleopterous fauna does not present a more southern aspect than that of Madeira. The large number of purely endemic forms seems to indicate the desirability of regarding the whole of the two groups of islands as constituting an Atlantic province.

Of the species mentioned in this volume about 540 have been first described by the author, and he has also established about 30 new genera. Many of these are described in scattered papers, chiefly in the Transactions of the Entomological Society of London and in the Annals and Magazine of Natural History, but a great number of new species, some of them forming the types of new genera, are described in the present volume, and will be referred to in their proper places.

* See, however, on this point a note by Crotch, referred to further on (p. 352).

B. *Works in Progress.*

FAIRMAIRE, LÉON. *Genera des Coléoptères d'Europe, comprenant leur classification en familles naturelles, la description de tous les genres, &c.* Livraisons 121-127. Paris, 1864.

M. Léon Fairmaire has published during the past year seven parts of his continuation of Jacquelin du Val's 'Genera of European Coleoptera,' a work which is too well known to need more than a passing notice in this place.

MOCQUERYS, E. *Recueil de Coléoptères anormaux.* No. 7. 8vo. Rouen, 1864. (Published by the author.)

The seventh part of this publication, by M. Mocquerys of Rouen, on monstrosities occurring in various species of Coleoptera, contains a title-page of the first volume and a classified index of the specimens figured in his six previous *livraisons*. He arranges these abnormal individuals in 4 classes, namely, 1. *Monstrosities by excess*, including examples of over-developed antennæ, palpi, and mandibles, elytra, legs, tarsi, and claws, and gibbosities; 2. *Monstrosities by deficit* in the number of parts; 3. *Monstrosities without appreciable cause*, including some very singular malformations of the antennæ and limbs; and, 4. *Incomplete development*. The examples of monstrosity are represented by outline woodcuts on separate pages, each accompanied by a short description. Many of them are exceedingly curious, especially the malformations by excess of the antennæ and limbs.

MULSANT, E. and REY, CL. *Histoire Naturelle des Coléoptères de France. Térédiles.* Paris, 1864, pp. 391, with 10 plates.

The volume of Mulsant's great work on the French Coleoptera published in 1864 is devoted to the description of the species of wood-boring Beetles forming the tribe Térédiles of Duméril, the Anobiidæ of most authors. Of these insects the authors enumerate and describe 87 species, or, excluding two species described by Fairmaire (*Xyletinus sanguineocinctus* and *Pseudochina bubalus*), of the distinctness of which they are doubtful, and another, *Xylet. pallens* (Germ.), of the occurrence of which in France they are not sure, 84 species as inhabitants of France. Of these, 10 are described as new; and the authors also describe four new generic groups. In its execution the work corresponds with the previous volumes of the series, and the descriptions are marked by the same minuteness of detail which is characteristic of Mulsant's writings. The plates contain a good series of outline illustrations of the structural characters of the insects.

THOMSON, C. G. Skandnaviens Coleoptera, synoptiskt bearbetade. Tom. vi. Lund, 1864, pp. 385.

The sixth volume of the admirable treatise of C. G. Thomson on the Scandinavian Coleoptera includes the sections *Serricornes* and *Heteromera* of Latreille, forming the tenth and eleventh series of Thomson's classification. From the former, however, he excludes the *Ptinidæ*. The remaining series are the *Rhynchophori*, *Longicornes*, *Phytophagi*, and *Aphidiphagi*. In this work the descriptions of all groups and of the species are in Latin, so that they may be made use of by entomologists of any country; and as they are admirably drawn up, and the analogy between the Scandinavian insect fauna and that of the northern parts of our own country is very considerable, there are few books equal to this in value for the British coleopterist.

C. Publications in Journals, &c.

ALLARD, E. Notes pour servir à la Classification des Coléoptères du genre *Sitones*. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 329-382. 12th Oct. 1864 (read 23rd March, 1864).

AUBÉ, C. Note sur la synonymie de l'*Apristus subaeneus* et de l'*Omius concinnus*. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 323-325. 12th Oct. 1864 (read 27th April, 1864).

AUBÉ, C. Description de trois nouvelles espèces de *Nanophyes*. Loc. cit. pp. 326-328.

BALY, J. S. Descriptions of new genera and species of *Eumolpidæ*. Journ. of Entom. vol. ii. pp. 219-223. (June 1864.)

BALY, J. S. Descriptions of uncharacterized genera and species of *Phytophaga*. Trans. Ent. Soc. London, 3rd ser. vol. ii. pp. 225-243. November 1864 (read 1st August, 1864).

BALY, J. S. Further descriptions of new genera and species of *Phytophaga*. Ibid. pp. 251-258 (read 3rd Oct. 1864).

BALY, J. S. Descriptions of genera and species of *Hispidæ*. Ann. & Mag. Nat. Hist. 3rd series, vol. xiv. pp. 261-271 and 334-345. October and November 1864.

BALY, J. S. Descriptions of some uncharacterized genera of *Phytophaga*. Entom. Monthly Mag. vol. i. pp. 133-136.

BALY, J. S. Descriptions of the species belonging to the genus *Paropsis*. Journ. of Entom. vol. ii. pp. 291-310. (December.)

BALY, J. S. Descriptions of new genera and species of *Phytophaga*. Ann. & Mag. Nat. Hist. 3rd series, vol. xiv. pp. 433-442. December 1864.

- BATES, H. W. Contributions to an Insect Fauna of the Amazon Valley. COLEOPTERA: LONGICORNES. Ann. & Mag. Nat. Hist. 3rd ser. vol. xiii. pp. 43-56, January 1864; pp. 144-164, February 1864; vol. xiv. pp. 11-24, July 1864.
- BAUDI DI SELVE, F. Coleopterorum messis in insula Cypro et Asia minore ab Eugenio Truqui congregatæ recensitio. Berl. entom. Zeitschr. 1864, pp. 195-233.
- BETHE. Bemerkungen über generelle Unterscheidungsmerkmale einiger Arten des Genus *Silis*. Stettiner entom. Zeitung, 1864, pp. 407, 408.
- BLACKBURN, T. Notes on Northern Coleoptera. Entom. Monthly Mag. vol. i. pp. 145-147.
- Contains a notice of the rarer and more remarkable species met with by the author during a collecting-tour through the northern counties of England in June.
- BLAND, J. H. D. Descriptions of several new species of North-American Coleoptera. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 65-72. May 1864.
- BLAND, J. H. D. Descriptions of new North-American Coleoptera. Ibid. pp. 253-256. September 1864.
- CANDÈZE, E. Elatérides nouveaux. Mémoires de l'Acad. Roy. de Belgique, tom. xvii., 1864.
- CHEVROLAT, AUGUSTE. Coleoptères de l'île de Cuba. Notes, synonymies et descriptions d'espèces nouvelles. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. pp. 589-620. March 23, 1864.
- In this memoir the author continues his descriptions of the Coleopterous insects of Cuba. It includes descriptions of 83 species, belonging to the families *Histeridæ*, *Phalacridæ*, *Nitidulidæ*, *Trogositidæ*, *Colydii*, *Rhysodidæ*, *Cacujidæ*, *Cryptophagidæ*, *Dermestidæ*, and *Byrrhidæ*, of which 20 are described as new (including one from Guadaloupe and another from Porto Rico), and 19 are new to the Cuban fauna.
- CLARK, HAMLET. Catalogue of the *Dytiscidæ* and *Gyrinidæ* of Australasia, with descriptions of new species. Part 3. Journ. of Entom. vol. ii. pp. 214-219 (June 1864).
- CLARK, HAMLET. Notes on the genus *Hydaticus* (Leach), with descriptions of new species. Trans. Entom. Soc. London, 3rd ser. vol. ii. pp. 209-222, pl. xiv. November 1864.
- CLARK, HAMLET. Notes on the genus *Schematiza* (*Phytophaga*, *Gallerucidæ*), with descriptions of new species. Trans. Entom. Soc. London, 3rd ser. vol. ii. pp. 259-270. November 1864.
- CLARK, HAMLET. Descriptions of new Australian *Phytophaga*. Journ. of Entom. vol. ii. pp. 247-263. (December 1864.)

- CLARK, HAMLET. Catalogue of Chrysomelidæ of South Africa. Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. pp. 115-124 and pp. 169-174. August and September 1864.
- CORNELIUS, C. Ernährung und Entwicklung von *Haltica oleacea* (Fab.). Stettiner entom. Zeitung, 1864, pp. 98, 99.
- DEYROLLE, HENRI. Description de plusieurs nouvelles espèces de la famille des *Lucanides*. Ann. Soc. Entom. Fr. 4^e sér. tom. iv. pp. 311-320, pl. iv. 12th October, 1864.
- DEYROLLE, HENRI. Nouveau genre de Cétonide (*Cremastochilides*). Ibid. pp. 321, 322, pl. iv.
- DIETRICH. Ueber die Geschlechtsverschiedenheiten bei den Käfergattungen *Bruchus*, *Rhynchites* und *Ceuthorhynchus*. Mittheil. Schweiz. entom. Gesellsch. 1864, pp. 269-274.
- DOHRN, C. A. Zur Synonymie der Cryptocephaliden. Stettiner entom. Zeitung, 1864, pp. 195, 196.
- EICHHOFF, W. Ueber die Mundtheile und die Fühlerbildung der europäischen *Xylophagi* sens. strict. Berl. entom. Zeitschrift, 1864, pp. 17-46, Tafel i.
- FAIRMAIRE, LÉON. Coléoptères d'Algérie, rapportés par M. Ogier de Baulny. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. pp. 637-648. March 23, 1864 (read July 22, 1863).
- FAIRMAIRE, LÉON. Note sur quelques Coléoptères recueillis par M. P. Germain, à Mendoza, dans les Cordilières. Ibid. tom. iv. pp. 261-274, pl. 6. fig. 1. October 12, 1864.
- FAUVEL, ALBERT. Remarques critiques sur les Staphylinides décrits par Solier dans l'Historia de Chile de Gay. Ibid. tom. iv. pp. 117-129. June 8, 1864.
- FAUVEL, ALBERT. Observations sur quelques caractères génériques du *Sphærius acaroides*, Waltl. Ibid. tom. iv. pp. 130-132. June 8, 1864.
- FAUVEL, A. Note synonymique sur quelques *Pæderus* européens. Bull. Soc. Linn. Normandie, vol. viii. pp. 12-14.
- FAUVEL, A. Partie entomologique du Compte Rendu de l'excursion de la Société Linnéenne de Normandie, 15 Juillet 1860. Bull. Soc. Linn. Norm. vol. viii. pp. 391-396.
- Contains notes of a few species of Coleoptera observed during the excursion, with a table of the distinctive characters of three species of *Bembidium*—viz. *B. normannum* (Dej.), *B. pusillum* (Gyll.), and *B. tenellum* (Erichs.).
- GRENIER. Description de trois nouvelles espèces de Coléoptères Français, des genres *Cionus* *Raymondia* et *Ano-*

phthalmus, et quelques réflexions sur les yeux de certaines espèces réputées aveugles. Ann. Soc. Entom. Fr. 4^e sér. tom. iv. pp. 133-140. June 8, 1864.

GRENIER. Réponse à la note (de M. de Saulcy) relative-ment au *Macharites mariae*. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. pp. 650-652. March 23, 1864.

HEYDEN, L. VON. Zur Synonymik der europäischen Coleopteren. Berliner entom. Zeitschr. 1864, pp. 318-328.

HEYDEN, L. VON. Ueber *Molorchus abbreviatus*, Panz., und *M. salicis*, Muls. Ibid. pp. 329-333. Taf. iv. figs. 6-7.

HEYDEN, L. VON. Fundorte einiger seltener Käfer der Schweiz. Mittheil. Schweiz. entom. Gesellsch., February, 1864, pp. 193-195.

Contains notices of the capture of 43 species of Coleoptera in different parts of Switzerland.

JÄCKEL, A. J. Das Brach- oder Johannis-Käferchen (*Anisoplia horticola*), ein landwirthschaftlich schädlicher Kerf. Corresp.-Blatt des zool.-mineral. Ver. in Regensburg, Jahrg. 18, pp. 79-80. 1864.

KELLER, ADOLPH. Verzeichniss der bisher in Württemberg aufgefundenen Colcopteren. Württemberg. naturwiss. Jahreshefte, 1864, pp. 213-305.

The author remarks that in the catalogues of German and European Coleoptera, and in descriptive works and memoirs upon this order of Insects, Württemberg is very rarely cited; and he ascribes this chiefly to the want of a good modern catalogue of the species occurring in that district of Germany, Roser's catalogue, published in 1838, being long since out of date. The author's catalogue is arranged in accordance with the system followed in the Stettin Catalogue of European Coleoptera; the localities of many of the species and their comparative rarity are indicated.

KIESENWETTER, H. VON. Beitrag zur Käferfauna Griechenlands. (Neuntes Stück) *Curculionidæ*. Berl. entom. Zeitschr. 1864, pp. 239-293.

KIESENWETTER, H. VON. Eine entomologische Excursion in Krain und dem Küstenlande im Jahre 1863. Berl. entom. Zeitschr. 1864, pp. 295-304.

KING, R. L. On the *Scydmanides* of New South Wales. Trans. Ent. Soc. of New South Wales, vol. i. pp. 91-99. Sydney, 1864 (read August 3, 1863).

KING, R. L. On the *Pselaphidæ* of Australia. Second paper. Ibid. pp. 102-106, pl. 7. Sydney, 1864.

- KRAATZ, G. Ueber die rothen Oreinen der Schweiz und die Unterscheidung der Oreinen im Allgemeinen. Mittheil. Schweiz. entom. Gesellsch. May 1864, pp. 205-213.
- KRAATZ, G. Ueber die Artrechte der europäischen Maikäfer (*Melolontha*, Fab.). Berl. entom. Zeitschr. 1864, pp. 1-16.
- KRAATZ, G. Einige für Deutschland neue Käfer. Berl. entom. Zeitschr. 1864, pp. 47, 48.
- KRAATZ, G. Zur kritischen Kenntniss europäischer Käferarten. Erstes Stück. Berl. entom. Zeitschr. 1864, pp. 131-142.
Contains critical remarks upon 50 European species of Beetles belonging to various families.
- KRAATZ, G. Grundzüge eines natürlichen Systems der Rüsselkäfer. Berl. entom. Zeitschr. 1864, pp. 154-170.
- KRAATZ, G., und KIESENWETTER, H. VON. Ueber die zur Unter-gattung *Anthodytes* Ksw. gehörenden Arten der Gattung *Malachius*. Berl. entom. Zeitschr. 1864, pp. 305-312.
- LINDER, JULES. Description de trois Coléoptères européens nouveaux. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 250-252. 12th October, 1864 (read 22nd June, 1864).
- MACLEAY, WILLIAM, JUN. On the Insects of Australia allied to the *Glaphyridæ*. Trans. Entom. Soc. of New South Wales, vol. i. pp. 75-90. Sydney, 1864 (read June 1, 1863).
- MACLEAY, WILLIAM, JUN. On the *Scaritidæ* of New Holland. Second Paper. Ibid. pp. 134-154. Sydney, 1864.
- MACLEAY, WILLIAM, JUN. Descriptions of new genera and species of Coleoptera from Port Denison. Ibid. pp. 106-130, pl. 9. Sydney, 1864 (read 5th October, 1864).
- MALINOWSKI, VON. Beiträge zur Naturgeschichte der Gyrinen. Verh. zool.-bot. Gesellsch. in Wien, Bd. xiv. pp. 677-680.
- MARSEUL, S. A. DE. Téléphorides. Tribu de la famille des Malacodermes. L'Abeille, tome i. pp. 1-108. April and June 1864.
- MARSHALL, T. A. Descriptions of new genera and species of *Eumolpidæ* from the Collection of the Rev. Hamlet Clark. Ann. & Mag. Nat. Hist. vol. xiii. pp. 380-389. (May.)
- MARSHALL, T. A. Corynodinorum recensio. Proc. Linn. Soc. vol. viii. pp. 24-50.
- MIEDEL, J. Liste de Coléoptères nouveaux pour la faune Belge. Annales Soc. Ent. Belge, tom. vii. pp. 137-139.
- MORS, L. Addenda au Catalogue des Coléoptères. Annales Soc. Ent. Belge, tom. vii. pp. 135, 136.

MORS, L. Notes sur quelques variétés de Coléoptères. Ann. Soc. Ent. Belge, tom. vii. pp. 129-133.

MURRAY, ANDREW. Monograph of the family of *Nitidulariæ*. Part I. Trans. Linn. Soc. Lond. vol. xxiv. pp. 211-414, plates 32-35.

The part of the Linnean Transactions for 1864 contains the first part of the most elaborate entomological memoir that has appeared for years—Mr. Murray's monograph of the *Nitidulariæ*. From his statement in the introduction, the investigations upon which this monograph is founded have occupied him for several years; he has examined the specimens belonging to this family in the Museums of London, Oxford, Paris, Berlin, Copenhagen, and Stockholm, and obtained specimens, typical or otherwise, from a whole host of British and foreign coleopterists. In this way he has brought together correctly-named examples of a vast number of species; and as the accumulated material has been added to the rich collection of our national museum, the future student of this group will have the double advantage of an elaborate monographic treatise to work with, and a nearly complete collection of types for reference.

The number of new species described by Mr. Murray is very considerable. Thus, of *Carpophilus* thirty-five species were previously described, the author describes ninety-three; of *Brachypeplus* there were five known species, this monograph contains descriptions of twenty-eight; and the eighteen species of *Colastus* described by former authors are here increased to forty-seven. With regard to genera the author holds that these groups are to be considered chiefly as artificial aids invented by man for the purpose of classification, the difficulties constantly occurring in the shape of intermediate forms, in every attempt at the accurate definition of genera, showing, in his opinion, that, "with a few exceptional breaks, the boundaries of the genera . . . have no real existence." But, singularly enough, he thinks the genera of Linnæus and his immediate successors may have natural boundaries, although it is evident that the same rule must apply to all groups; and practically we know that the limits certainly of families, and in many cases also of orders, are not easily defined so as to include all the species that we wish to refer to them, and no others.

After a detailed description of the general structural characters presented by the insects belonging to the family, and an account of the metamorphoses of the few species of which the early states are known, the author proceeds to an exposition of the internal classification of the family, which, with the new genera and species, will be noted hereafter. The introductory portion of this work is illustrated with numerous outline woodcuts of the different parts of the insects; and similar illustrations

of characteristic portions, especially of the pronotum, are scattered through the descriptions of species.

There are, however, one or two defects in the execution of the memoir, probably due to the adoption by the author of the reprehensible practice of making additions or alterations during the progress of his work through the press, which, although they may be of no very material consequence, nevertheless produce a certain appearance of haste or carelessness in a work evidently of great labour and research, and even cause some real confusion in the treatment of the subject. Thus on p. 231, in the table of the genera of *Brachypteridæ*, we find *Amartus* (Lec.) figuring as a distinct genus, whilst, on the very same page, it again occurs as a subgenus of *Cercus*, and this is the position occupied by it finally. Again, at page 257 the section *Late fimbriata* of the tribe *Carpophilidæ*, is tabulated to show three genera, *Colastus*, *Brachypeplus*, and *Halopeplus*; the descriptions of the two former genera follow in their order, but instead of *Halopeplus* we find a long series of small genera, mostly new, entirely omitted in the table, and among which there is no genus *Halopeplus*, the place of which is probably occupied by *Haleopeplus*. Of the second section of *Carpophilidæ*, the *Anguste-fimbriata*, no table of genera is given.

PARRY, F. J. S. A catalogue of Lucanoid Coleoptera, with illustrations and descriptions of various new and interesting species. Trans. Ent. Soc. London, 3rd series, vol. ii. pp. 1-113, pl. x.-xii. May 1864.

PASCOE, F. P. Descriptions of some new Australian *Longicornia*. Journ. of Entom. vol. ii. pp. 223-245. (June 1864).

PASCOE, F. P. Note on the Australian species of *Clytus*. Journ. of Entom. vol. ii. pp. 245-246. (June 1864).

PASCOE, F. P. Additions to the *Longicornia* of South Africa, including a few species from Old Calabar and Madagascar. Journ. of Entom. ii. pp. 270-291. (December 1864).

PASCOE, F. P. *Longicornia Malayana*; or a descriptive catalogue of the species of the three Longicorn families *Lamiidæ*, *Cerambycidæ*, and *Prionidæ*, collected by Mr. A. R. Wallace in the Malay Archipelago. Trans. Ent. Soc. London, 3rd series, vol. iii. September 1864.

PERAGALLO, A. Seconde note pour servir à l'histoire des Lucicoles. Ann. Soc. Ent. Fr. 4^e série, tome iii. pp. 661-665. 23rd March, 1864 (read 8th July, 1863).

PEREZ, ARCAS. Histoire des métamorphoses du *Macronychus quadrituberculatus*, et de son parasite. Ann. Soc. Ent. Fr. 4^e série, tome iii. pp. 621-636, pl. 14. 23rd March, 1864.

PERRIS, EDOUARD. Description de quelques espèces nouvelles de Coléoptères, et notes diverses. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 275-310. 12th October, 1864.

PHILIPPI, R. A. & F. Beschreibung einiger neuen Chilenischen Käfer. Stettiner entom. Zeitung, 1864, pp. 266-284 & 313-406.

PHILIPPI, R. A. Ein Käferchen, das als Gewürz dient. Stett. Entom. Zeitung, 1864, pp. 93-96.

This paper contains the description of a new species of *Elmis*, which is employed in Peru for flavouring a peculiar dish. The insects, according to Dr. Barranca of Lima, are obtained from the still waters of the brooks and rivers of the Cordillera in great quantities, worked up with dough into lumps, and sold under the name of *chiche*; the dish prepared from them is known as *chupe de chiche*.

REICHE, L. Espèces nouvelles de Coléoptères d'Algérie. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 233-246. 12th October, 1864 (read 24th February, 1864).

REICHE, L. Description de trois espèces nouvelles de Coléoptères Français. Ibid. pp. 247-249. 12th October, 1864.

RYE, E. C. Descriptions of the British species of *Stenus*. Entom. Monthly Mag. vol. i. pp. 6-11, 36-43, 59-65, 86-92, and 108-112.

RYE, E. C. Description of a species of *Ceuthorhynchideus*, new to science. Entom. Monthly Mag. vol. i. p. 137.

RYE, E. C. Descriptions of the British species of *Bolitobius*. Entom. Monthly Mag. vol. i. pp. 155-160.

RYE, E. C. Coleoptera: New British species, corrections, &c. noticed since the publication of the Entomologists' Annual, 1863. Entomologists' Annual, 1864, pp. 30-86.

RYE, E. C. Coleoptera: New British species, &c. in 1864. Entomologists' Annual, 1865, pp. 37-80.

In these elaborate Reports Mr. Rye notices all the recorded discoveries of species new to the British fauna, and indicates any changes in the nomenclature of previously known British species in the course of each year. The characters by which the newly detected inhabitants of our islands may be distinguished from their allies are also pointed out. The Report for 1863 (Ent. Ann. 1864, pp. 73-84) contains a criticism on Dr. Crotch's "Catalogue of British Beetles," which is reprinted in Zoologist, 1864, pp. 9002-9009.

SAULCY, FÉLICIEN DE. Faune Française et Européenne. Descriptions et Remarques. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 253-260. 12th October, 1864.

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SCHAUM, H. Die egyptischen Dytisciden. Berl. entom. Zeitschr. 1864, pp. 105-113.

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SCHAUM, H. Beiträge zur kritischen Kenntniss europäischer Carabiceen. Berl. entom. Zeitschr. 1864, pp. 142-144.

SCHAUM, H. Notice of the "Catalogue des Coléoptères d'Europe et du Bassin de la Méditerranée en Afrique et Asie, par M. S. A. de Marseul," 2nd edit. Berl. entom. Zeitschrift, 1864, pp. i-iv.

Schaum gives many corrections of synonymy in the notes to this article.

SCHAUM, H. Revision der *Zabroiden*. Berl. entom. Zeitschr. 1864, pp. 171-194.

SCHAUM, H. Die Stellung der Strepsipteren im Systeme. Archiv für Naturgesch. 1864, pp. 145-153. Transl. in Ann. & Mag. Nat. Hist. 3rd ser. vol. xv. pp. 53-59.

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This paper, referred to in Ann. & Mag. Nat. Hist. 3rd ser. vol. xv. p. 475, has not been seen by the Recorder.

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SOLSKY, — VON. Eine neue Art der Staphylinen-Gattung *Homorocerus*. Ibid. pp. 374-376, Taf. iv. figs. 8-9.

STIERLIN, G. Monographie des *Otiorhynchus* d'Europe, de M. le Dr. G. Stierlin. Traduction du Tableau analytique des groupes, par M. G. A. Baer. Ann. Soc. Ent. Fr. 4^e série, tom. iv. pp. 159-180. 8th June, 1864.

STIERLIN, G. Ueber einige neue oder wenig gekannte Insekten der Gegend von Sarepta. Bull. Soc. Imp. Nat. Mosc. 1863, pp. 489-502 (publ. February 1864).

STIERLIN, G. Ueber einige neue und wenig bekannte sicilische Käferarten. Berl. entom. Zeitschr. 1864, pp. 143-153.

STIERLIN, G. Zusammenstellung der durch Herrn Meyer-Dür in Tessin und Oberengadin beobachteten und eingesammelten Coleopteren. Mittheilungen Schweiz. entom. Gesellsch. February 1864, pp. 165-172.

This paper contains a list of 248 species of Coleoptera collected and observed in the spring and summer of 1863 in the Ticino and the Upper Engadine, with statements of the localities and situations in which they were found, and the elevation at which some of the species were met with.

STIERLIN, G. Ein Ausflug ins Engelberger Thal im Sommer 1864. Ibid. November 1864, pp. 255-258.

Contains an account of the species of beetles met with by the author in the neighbourhood of Engelberg, but with no remarks of general interest.

STIERLIN, G. Uebersicht der in Europa und den angränzenden Ländern einheimischen Arten der Gattung *Simonius* (= *Limonius*). Ibid. February 1864, p. 192.

STIERLIN, G. Uebersicht der in Europa und den angränzenden Ländern einheimischen Arten der Gattung *Cardiophorus*. Ibid. May 1864, pp. 214-218.

SUFFRIAN, G. Synonymische Miscellaneen. Stettiner entom. Zeitung, 1864, pp. 86-88 & 263-265.

THOMSON, C. G. Entomologiska Bidrag. II. Om *Eucinetus* og dess plats i systemet. Öfvers. Kongl. Vetensk. Akad. Förhandl. 1863, pp. 477-481 (publ. 1864).

TOURNIER, H. Descriptions de quelques nouveaux Coléoptères européens. Mittheil. Schweiz. ent. Gesellsch. November 1864, pp. 265-269.

VOLLENHOVEN, S. C. SNELLEN VAN. Beschrijving van eenige nieuwe soorten van Curculioniden, uit het geslacht *Aporoderus*, Oliv. Tijdschrift voor de Dierkunde, 1864, pp. 158-167.

WATERHOUSE, G. R. Description of a new species of *Articerus* from Australia. Entom. Monthly Mag. vol. i. pp. 149-150.

WENCKER. Apionides, Tribu des Curculionides. L'Abeille, tom. i. pp. 109-270. June, July, and September 1864.

WESTWOOD, J. O. Descriptions of some new species of Coleopterous Insects belonging to the Eupodous *Phytophaga*, natives of the Old World and Australia. Trans. Ent. Soc. London, 3rd series, vol. ii. pp. 271-280. November 1864.

WILKEN, C. Zur Fauna des Oberharzes. Berl. entom. Zeitschr. 1864, pp. 369-373.

WOLLASTON, T. V. On the structure and affinities of the Latridii. Entom. Monthly Mag. vol. i. pp. 14-19.

D. Anatomical and Physiological Memoirs.

LINDEMANN, CARL. Anatomische Untersuchung über die Struktur des Leuchtorganes von *Lampyrus splendidula*. Bull. Soc. Imp. Nat. Mosc. 1863, pp. 437 ff. pl. vii. B. (Anatomical investigation of the structure of the luminous organ of *Lampyrus splendidula*.) Publ. February 1864.

The author describes the structure of the organ, and especially the arrangement of the nerves with which it is supplied; he refers the luminosity to direct nervous influence, and compares the organ to the electrical organs of Fishes.

OFSIANIKOF, P. Ueber das Leuchten der Larven von *Lampyrus noctiluca*. Bull. Acad. Imp. de St. Petersburg. tom. vii. pp. 55-61 (read 30th October, 1863).

In August all the larvæ, whether small or large, possessed the faculty of emitting light. The light is emitted only by the antepenultimate segment, on the lower lateral surface of which there are two bright points. The light proceeds from two small saccules, which approach the surface when the insect extends itself, and the light is then emitted. When the insect contracts, the saccules retreat into the interior and the light ceases. The saccules, when removed from the body of the insect, still emit a bright light for a considerable time; and this is the case even when they are torn to pieces; but as they become desiccated they lose this property. By examining a saccule thus torn, by its own light under the microscope, Ofsianikof found it to consist of a membrane and a fluid; the light appeared to be

connected solely with the former. Luminous saccules were placed in oil and in water, when no effect was produced on the luminosity. Strong acids and alkalies caused the cessation of the light. The same effect was produced by glycerine; but on washing this away with water, the luminosity recommenced. *In vacuo* the luminosity ceases, but it recommences on the admission of a little air. In carbonic-acid gas the light becomes very dull.

PASTEUR. Note sur la lumière phosphorescente des Cucujos (*Pyrophorus*), et sur l'absence de raies dans le spectre fourni par cette lumière. Comptes Rendus, 1864, 2^e semestre, p. 509.

SCHULTZE, MAX. Ueber den Bau der Leuchtorgane der Männchen von *Lampyrus splendidula*. (On the structure of the luminous organs of the male of *Lampyrus splendidula*.) Verhandl. naturh. Vereins preuss. Rheinl. und Westphal. 1864, (Sitzungsber.) pp. 61-67.

Professor Schultze describes the luminous organs of *Lampyrus splendidula* ♂ as consisting of two separate thin laminæ of a white colour, each occupying nearly the whole width of a segment. The organs are situated immediately beneath the skin of the ventral surface of the penultimate and antepenultimate segments of the abdomen; their upper surface is contiguous to the last two ganglia of the ventral chain, and here also are situated large tracheæ and the greatly developed sexual organs. Each luminous organ thus receives its numerous and finely divided nerves and tracheæ from the dorsal surface. The author describes the intimate structure of the laminæ, and indicates the existence in them of a new structural element, to which he gives the name of terminal cells of the tracheæ (*Tracheenendzellen*).

GENERAL NOTES.

THOMSON (Skandinaviens Coleoptera) adopts the following broad classification of the Coleoptera. The whole order is divided into fifteen great sections or *series*, most of which are identical, or nearly so, with the primary divisions of Latreille, namely *Carnivori*, *Palpicornes*, *Amphibii* (= Gyrinidæ, Heteroceridæ, Parnidæ, &c.), *Brachelytra*, *Clavicornes*, *Lamellicornes*, *Platysoma* (= Cucujidæ and Trogositidæ), *Xylophagi* (Colydiidæ, Ptinidæ, &c.), *Fungicola*, *Serricornes*, *Heteromera*, *Rhynchophori*, *Longicornes*, *Phytophagi*, and *Aphidophagi*.

The *Serricornes*, which occupy the first 232 pages of Thomson's sixth volume, published last year, are divided, in accordance with Latreille's system, into two stirpes, *Sternoxi* and *Malacodermi*, and these again into numerous families, tribes, and subtribes. The *Sternoxi* include *Buprestidæ*, *Melasidæ*, and *Ela-*

teridæ; and the Malacodermi are divided into *Cyphonidæ*, *Dasytidæ*, *Lampyridæ*, *Cantharidæ*, *Clerii*, *Corynetidæ*, and *Xylotrogi*. The Heteromera in like manner form two stirpes, *Globicoxæ* and *Conicoxæ*, the former of which includes the families *Blaptidæ* (*Blaps*, *Crypticus*, *Opatrum*, and allies), *Boletophagidæ*, *Diaperidæ*, *Upidæ*, *Tenebrionidæ*, *Lagriariæ*, *Cistelidæ*, *Mordellonæ*, *Hallomenidæ*, *Serropalpιδæ*, *Melandryidæ*, *Boridæ*, *Salpingidæ*, and *Pythonidæ*; and the latter the *Pyrochroidæ*, *Meloidæ*, *Lyttidæ*, *Stenotrachelidæ*, *Rhipiphoridæ*, *Calopodidæ*, *Edemeridæ*, *Anthicidæ*, and *Xylophilidæ*.

SCHAUM (Archiv. für Naturgesch. 1864, pp. 145-153) discusses the systematic position of the Strepsiptera, with special reference to the views of Gerstäcker, who places them among the Neuroptera, and regards them as most nearly allied to the Phryganidæ (see Handbuch der Zoologie, von Peters, Carus, und Gerstäcker, vol. ii. pp. 78-80). Schaum considers the arguments adduced by Gerstäcker in favour of his opinion of the affinities of the Strepsiptera, and shows that the characters adduced by that entomologist in proof of their relationship to the Neuroptera are fallacious, and that, both in structure and mode of life, the Strepsiptera must be referred to the Coleoptera, amongst which their nearest allies are the Cantharidan genera *Meloë* and *Sitaris*, and probably *Rhipidius*. Gerstäcker ascribes sac-like branchiiform organs to the larvæ of Strepsiptera on the authority of Newport, and upon this supposed peculiarity founds one of his strongest arguments for their Neuropteran affinities; Newport, however, expresses himself very guardedly with regard to these organs, which, he says, "from their resemblance to branchial sacs, may perhaps be regarded as imperfect respiratory organs of the nature of branchiæ."

CROTCH publishes (Entomologist, vol. ii. pp. 111-113) a note on the Coleopterous fauna of the Atlantic islands, with reference to Wollaston's statements. After quoting the numbers of species assigned to each island by Wollaston, he states that these are probably far too low, especially in the case of Grand Canary, Palma, and Hierro. He gives the following table, showing in the first column the number of species detected in Madeira, in the second the proportionate number which might be expected to occur in the Canaries, and in the third the number ascertained to exist there:—

MADEIRAN.			CANARIAN.		
			Proportionate.		Ascertained.
Geodephaga	78	....	118	....	123
Hydradephaga	9	....	14	....	22
Philhydryda	17	....	26	....	25
Necrophaga	120	....	182	....	131
Cordylocerata	26	....	39	....	53
Priocerata	44	....	66	....	95

	MADEIRAN.	CANARIAN.	
		Proportionate.	Ascertained.
Rhynchophora	129	195	191
Eucrata	11	17	15
Phytophaga	27	41	44
Pseudotrimeria	26	39	19
Heteromera	55	83	129
Brachelytra	117	177	150
	659	997	997

GRENIER (Ann. Soc. Ent. Fr. 4^e série, tome iv, pp. 137-140) has some observations on the traces of eyes in beetles reputed blind. Having found indications of eyes in *Anophthalmus*, he examined the other blind beetles, and found in *Aphenops* an excessively minute surface marking the position of the visual organ. In *Leptoderus*, *Adelops*, &c., no trace of an eye can be detected; but in *Glyptomerus cavicola* there is a very small one, presenting no facets, but distinguishable by its pale colour. He suggests that in many cases the internal portions of the organs of vision may be sufficiently developed to enable these insects to perceive the faint rays of light that may find their way into the caverns; in others, however, it has been found that the visual nerves are either wanting or rudimentary, indicating that the sense of sight can hardly be exercised by these. Further observations on the anatomy of this part of the nervous system in the blind beetles inhabiting dark caverns and ants' nests are very desirable.

STIERLIN (Berl. entom. Zeitschr. 1864, p. 143) remarks that the Coleopterous fauna of Sicily presents but a small number of peculiar species, certainly fewer than that of Corsica and Sardinia. It presents the closest agreement with that of southern Italy, next with Sardinia, Corsica, and the south of France, and also with the opposite coast of Africa. It differs widely from the fauna of Greece, Dalmatia, and Spain; but many of the species of the mountainous districts occur also in the Pyrenees. The species common to Sicily and central Europe generally present some differences of size, form, sculpture, or colour.

BAUDI (Berl. ent. Zeitschr. 1864, pp. 195-233) gives a list of 303 species of Coleoptera belonging to the families noted below, found by Truqui in Cyprus and Asia Minor. The numbers in the different families are as follows:—*Cicindelidæ*, 5; *Carabidæ*, 179; *Dytiscidæ*, 18; *Gyrinidæ*, 6; *Palpicornia*, 30; *Silphales*, 12; *Trichopterygia*, 6; *Scaphidilia*, 2; *Histeridæ*, 46. Several of the species are described as new, and one of them as the type of a new genus (*Cymbionotum* in *Carabidæ*). Of the known species many varietics are described, and the text and notes contain remarks on synonymy by the author and by Schaum.

The notes also contain descriptions of several new Beetles belonging to the south of Europe.

WILKEN (Berl. ent. Zeits. 1864, p. 369 *et seq.*) gives a list of species of Coleoptera detected in the Upper Hartz during a three weeks' residence near the Brocken in July 1864. The elevation was about 2900 feet. The universally distributed species are said to be omitted; but the names of several very common forms figure in the list. The total number of species recorded is 195.

OLIVIER-DELAMARCHE has published a note of the principal forms of Beetles found by him on the sea-shore at Bone, in Algeria, after a great land-flood (Bull. Soc. Ent. Fr. 1864, p. ix).

Rye (Ent. Ann. 1864) records the addition of 40 species to the list of the British Coleopterous fauna during the year 1863; of these about 12 had previously been confounded with other recognized British species. In a criticism on the Catalogue of British Coleoptera by Crotch, the author objects especially to the treatment shown by the latter to British authors, whose names, he thinks, are often suppressed, without sufficient reason, in favour of those given by continental authors.

Crotch replies to some of Rye's remarks in a paper "On some new or rare British Coleoptera," Zoologist, 1864, pp. 8998-9001 and 9057-58; and the same journal contains (pp. 9059-64) a rejoinder from the latter entomologist.

The list of new British Coleoptera for 1864 (Ent. Ann. 1865) includes only 28 species.

Bold has published a catalogue of "Coleopterous insects added to the Fauna of Northumberland and Durham in 1863," Trans. Tynes. Nat. Field Club, vol. vi. pp. 225-231. This list includes 54 species, chiefly Staphylinidæ.

Keller has published a catalogue of the Coleoptera of Württemberg. Württemb. naturw. Jahreshefte, 1864, pp. 213-305.

Mors and Miedel record the occurrence in Belgium of numerous species of Coleoptera not previously noticed in that country. Ann. Soc. Ent. Belge, tom. vii. pp. 135 & 137.

A long discussion on the synonymy of certain species of European Coleoptera, on the part of Schaum and Kiesenwetter on the one side, and Reiche, de Sauley, and Fairmaire on the other, is published in Ann. Soc. Ent. Fr. 4^e sér. tome iii. pp. 669-686.

CICINDELIDÆ.

Cicindela nigrina, sp. n., MacLeay (Trans. Ent. Soc. N. S. W. i. p. 107), from Port Denison.

CARABIDÆ.

General notes on the family:—

SCHAUM has described the larva of *Procerus scabrosus*, Berl. entom. Zeitschr. 1864, p. 114, pl. 2. fig. 4. His specimens are from the neighbourhood of Brussa, and measure 15 and 16 lines in length, and $5\frac{1}{2}$ lines in breadth. In

structure they resemble the larvæ of the genus *Carabus*, but are distinguished by the great width of the body, especially of the dorsal abdominal segments, and by their beautiful violet colour.

The same author describes the larva of *Eurygnathus lutreillii* (Lap.) from specimens collected in Madeira by Wollaston (*l. c.* p. 115, pl. 2. fig. 5). The largest specimens were 10 lines in length, and therefore, like the preceding, not full-grown. These larvæ possess a very small head and have lateral processes on the abdominal segments, in these respects resembling the larvæ of the allied genera *Dicatus* and *Chlænius*.

Schaum also describes (*l. c.* p. 116, pl. 2. fig. 6) the larva of *Acanthogenius piceus* (Schaum) = *Creagris labrosa* (Nietn.). The specimen sent from Ceylon by Nietner is only 5 lines long and 1 line broad, and is therefore immature. The head is of moderate size and nearly quadrangular, with an angular impression on the vertex; mandibles very short, and the other buccal organs small. Thorax a little wider than the head, horny and brown above. Abdominal segments nearly equal in breadth, slightly narrowed behind; the last segment terminates in two acute processes. Legs very short, with two very small claws.

SCHAUM has published (Berl. ent. Zeitsch. 1864) a revision of the Zabroid group, in which he admits only the two genera *Eutroctes* and *Zabrus*, regarding *Pelobatus* (Fischer) as synonymous with the old genus *Zabrus*, and *Pelor*, *Polysitus*, and *Acorius* (Zimm.) as subordinate groups of *Zabrus*.

Of *Eutroctes* Schaum admits 5 species, namely, *E. chalconus* (Fald.), including as varieties *E. aureolus*, *lugubris*, and *costipennis* (Fald.); *E. oxygonus* (Chaud.); *E. heros* (Fald.); *E. aurichalceus* (*Blaps aurich.*, Adams), with which *P. adamsii* and *füssii* (Fisch.), *E. mæstus* (Küst.), *E. punctipennis* (Chaud.), and probably *E. congener* (Zimm.) are identical; and *E. levigatus* (Chaud.), which Schaum proposes to name *aciculatus*, as there is already a *Zabrus levigatus* (Zimm.). The latter may be a variety of *E. aurichalceus*.

In Zimmermann's Group I. of *Zabrus*, Schaum places *Z. obesus*, *gravis*, *dentipes*, *marginicollis*, *inflatus*, *curtus* (= *curtoides*, Chaud., and *pyrenæus*, Fairm. & Laboulb.), *rotundatus* (Ramb.), *crepidoderus* (Schaum) = *rotundicollis* (Ramb.), *ambiguus* (Ramb.), *angustatus* (Ramb.), *constrictus* (Graells), and *neglectus* (n. sp.). Group II. includes *Z. crassus*, *levigatus*, *semipunctatus* (Fairm.), *distinctus* (Luc.) = *rotundipennis* (Fairm.), *contractus* (Fairm.), *ovalis* (Fairm.), *levicollis* (Schaum) = *levigatus* (Reiche), *flavangulus* (Chevr.) = *silphoides* (Zimm.), and *sublevis* (Ménétr.). Group III. includes only *Z. pinguis* and *Z. seidlitzii* (n. sp.). In Group IV. Schaum places *Z. græcus* (including as synonyms or varieties *Z. puncticollis* (Brulle), *intermedius* and *convexus* (Zimm.), and *subtilis* (Schaum)), *Z. incrassatus*, *robustus* (Zimm.) = *fontenayi* (Dej.), *damascenus* (Reiche), of which *helopioides* (Reiche) is a variety, *validus* (Schaum), and *punctiventris* and *seriatoporus* (n. sp.). In Zimmermann's Group V. Schaum includes numerous species:—*Z. femoratus* (Dej.), *asiaticus* (Lap.) = *Pelor ovipennis* (Chaud.), *tumidus* (Reiche), *reflexus* (Schaum), *rotundicollis* (Ménétr.) = *caramanica* (Peyron), *ovipennis* (Chaud.), *trini* (Fisch.) = *caucasicus* (Zimm.), and seven new species. Group VI. contains the common *Zabrus gibbus*, of which *elongatus* (Ménétr.), *elongatus* (Costa),

and *longulus* (Reiche) are varieties; also *Z. piger* (Dej.), *orsinii* (Dej.), *gibbosus* (Zimm.), and *cognatus* (Chaud.). Zimmermann's Group VII. included only *Z. silphoides* (Zimm.), referred by Schaum to the second group under Chevrolat's name *flavangulus*. To the subgenus *Pelor*, Schaum refers *P. blapoides* (Dej.), with varieties *stevani* (Fisch.)=*tauricus* (Chaud.) and *rugosus* (Ménétr.), and *P. foveolatus*, n. sp.; to *Polysitus*—*P. faretus* (Zimm.)=*puncticollis* (Dej.)=*globosus* (Gory), *P. ventricosus* (Zimm.), and 2 new species; and to *Acorius*—*A. metallescens* (Dej.) and *A. ghilianii* (Baudi, n. sp.). The total number of species recorded is therefore 64.

Schaum (Berl. entom. Zeitschr. 1864, pp. 117, 118) remarks upon the relations of the *Ozanidæ* and *Pseudomorphidæ* to the other *Carabici*, and also upon the systematic position of *Mormolyce*.

Notes on known species and genera:—

C. A. WILSON has communicated to the Entomological Society (Ent. Trans. 3rd ser. vol. i., Proc. p. 182) some notes on the natural history of *Calosoma curtisii*, which has been found in some numbers in Adelaide. The larvæ and perfect beetles are met with together, from which the author infers that the preparatory states of the insect occupy several years; they occur chiefly on the bare ground, or conceal themselves under dry cowdung. The full-grown larvæ are described as very active and of a dull black colour, with red bands.

Fauvel (Bull. Soc. Ent. Fr. 1864, p. xxiii) remarks that *Notiophilus germiny* (Fauv.) is a small alpine form of *N. palustris* (Duftschm.); *Carabus brisouti* (Fauv.) is a variety of *C. catenulatus*; *Ophonus fauvelii* (Math.) is identical with *O. cribricollis* (Dej.); *Leptusa nigra* (Bris.)=*L. rupestris* (Fauv.); and *Geodromicus anthracinus* (Bris.)=*G. nigritus* (Müll.). The same author mentions the capture at Honfleur of *Bembidium lunatum* (Dufts.).

According to Schaum, *Procrustes obtrit* (Chaud.) is founded upon very convex specimens of *P. foudrasii* (Dej.), and *Carabus accuratus* (Chaud.) is a broad variety of *C. estreicheri*. Berl. ent. Zeitschr. 1864, p. 142.

Aptinus cordicollis (Chaud.) is identical with *A. pyrenæus*, according to Schaum, l. c. p. 142. The same author states that *Brachinus bellicosus* (Duf.)=*jaculans* (Dej.), *B. italicus* (Dej.), *B. bæticus* (Ramb.), and *B. hispalensis* (Ramb.) are founded on very slight modifications of the same species. *B. græcus* (Dej.)=*ejaculans* (Fisch.) is a variety of *B. immaculicornis* (Dej.). L. c. p. 143.

Schaum also says that *Licinus angustus* (Chevr.)=*L. æquatus* (Dej.); *Feronia æraria* (Coq. et Fairm.)=*F. mauritanica* (Dej.); *Feronia crenatipennis* (Chaud.) is not the true *F. crenatipennis* (Du Val)=*decipiens* (Walt), but a variety of *F. bætica* (Ramb.). Schaum repeats his assertion that *F. purpurascens* (Dej.) and *F. cupripennis* (Fairm.)=*grata* (Chaud.) are identical; *F. lyrodera* (Chaud.) belongs to *Adelosia*; *Feronia cognata* (Dej.) is not *F. schmidtii* (Kunze) or *Pterost. placidus* (Rosenh.), but the male of *F. extensa* (Dej.); *Feronia (Argutor) difficilis* (Chaud.)=*F. strenua* (Dej.)=*Pterost. pygmaeus* (Erichs.); *F. (Argutor) mæotica* (Chaud.) is probably a

female of *diligens* (Sturm); *Feronia acrogona* (Chaud.) belongs to the sub-genus *Haptoderus*; *Pterostichus pygmaeus* (Chaud.) = *P. lasserrei*; *Pterost. italicus* (Chaud.) = *P. transversalis*. *Feronia validiuscula* (Chaud.) appears to be a large female of *F. yvanni*; *F. transsylvanica* (Chaud.) is nearly allied to *F. kokeili*, but is distinguished by two distinct striae on each side of the base of the prothorax. *Feronia dissimilis* (Villa) is very near *Pter. metallicus*, var. *baldensis* (Schaum), and this is probably *P. obtusus* (Sturm). *Pter. (Molops) spartanus* (Schaum) is not identical with *Feronia longipennis* (Dej.), but is rather a small form of *F. bucephalus*. *Harpalus annulatus* (Chaud.) = *convexicollis* (Ménétr.) is identical with *H. cribricollis* (Dej.). *Harpalus patrucelis*, *fastiditus*, and *incertus* (Dej.) belong to one species. Schaum l. c. pp. 143, 144.

Schaum also states that *Dyschirius chalybæus* (Putz.) is merely a colour-variety of *D. æneus*: l. c. p. 144.

Schaum (l. c. p. 120, pl. 2. fig. 2) describes a peculiar variety of *Carabus lafertei* (Chaud.) from the Caucasus. The same author remarks (*ibid.*) that *Carabus invictus* (Chaud.) was previously described by Hampe as *C. schamylii*, and that *Carabus sterenii* (Ménétr.) is the same as *C. mussini* (Germ.), and is probably to be regarded as a variety of *C. osseticus*.

Disphæricus gambianus (Waterh.) and *Dyschiridium ebeninum* (Chaud.) are said by Schaum (l. c. p. 121) to agree so closely in structure that they must be regarded as two species of the same genus. He describes the characters of these species and of a third new one from Tranquebar. The genus is most nearly allied to *Pelecium*.

Promecognathus. Schaum (l. c. pp. 123, 124) has some remarks upon the systematic position of this genus, in which he states that the mesothoracic epimera do not reach the coxæ, and therefore the position assigned to this genus by Leconte cannot be maintained. Schaum regards it as nearly allied to *Disphæricus*, *Axinidium*, and *Pelecium*, and refers these four genera to the *Broscides*.

Baudi (Berl. ent. Zeits. 1864, p. 196) gives a detailed description of *Procrustes anatolicus* (Chaud.); the same author describes a remarkable variety of *Carabus depressus* (Bon.), l. c. p. 197, note; *Clivina lernæa* (Schaum) = *subcylindrica* (Peyron), l. c. p. 199; and a Sardinian variety of *Metabletus foreola* (Dej.), l. c. p. 203, note. Baudi regards *Cymindis confusa* (Peyron) as identical with *C. servillei* (Sol.), l. c. p. 204, note. He also indicates some of the Alpine varieties of *Cymindis axillaris* (Fab.), l. c. p. 205, note; remarks upon *Feronia oberleitneri* (Dej.) and its supposed variety *F. stricta* (Dej.) = *angustiformis* (Sol.), that, from his examination of numerous specimens, they really constitute two species, l. c. p. 208, note (to which Kraatz appends a note in support of the opposite opinion); describes in detail *Tachys globosus* (Chaud.) = *Elaphropus caraboides* (Motsch.), l. c. p. 217; and describes Cyprian varieties of *Tachys sexstriatus*, one of which seems to be identical with *T. decolorans* (Chaud.), l. c. p. 219.

According to Schaum, *Licinus hierichonticus* (Reiche) = *egyptiacus* (Dej.), Berl. ent. Zeits. 1864, p. 206, note; *Sphodrus cordicollis* (Chaud.) = *Dolichus cordatus* (Chevr.), l. c. p. 207, note; *Feronia pertusa* (Schaum) = var. *F. crenata* (Dej.), l. c. p. 208, note; *Amara ægyptia* (Zimm.) = *Harpalus rufescens* (Dej.), l. c. p. 210, note; *Bembidium lafertei* (Duv.) = *præustum* (Dej.) = var. *siculum* (Dej.), l. c. p. 220, note.

Aubé maintains (Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 323) that all the European forms of *Apristus* belong to one species, for which he retains Chaudoir's name *A. subaneus*.

Mors describes a variety (*putzeysii*) of *Curabus auronitens* (Fab.), Ann. Soc. Ent. Belg. tom. vii. p. 129, pl. 3. fig. 8.

Stierlin describes Sicilian varieties of *Anchomenus albipes*, *Amara nitida*, and *Bembidium punctulatum*. Berl. ent. Zeitschr. 1864, p. 146.

Bembidium fockii (Hummel) is figured by Rye, Ent. Ann. 1865, fig. 4.

Reiche has sent French specimens of *Anchomenus ruficollis* (Gautier des Cottés) to St. Petersburg for comparison with the types of *A. collaris* (Ménétr.). They are said to belong to the same species, as asserted by Schaum. Bull. Soc. Ent. Fr. 1864, p. viii.

Kraatz (Berl. ent. Zeitschr. 1864, p. 131) states that *Amara cursitans* (Zimm.) is identical with *A. fusca*; and is inclined to regard *Percus operosus* (Chaud.) as a stunted form of *P. lacertosus*.

New genera :—

Acrogenys, MacLeay, Trans. Ent. Soc. N. S. W. i. p. 109. Allied to *Helluo*. Maxillæ arcuate and acute; maxillary palpi thick, penultimate joint short, last joint truncate. Labium membranaceous or coriaceous; paraglossæ long, curved inwards; labial palpi rather elongate; mentum with the lateral lobes acuminate, lobate in the middle. Sp. *A. hirsuta*, MacLeay.

Trigonothops, MacLeay, l. c. p. 110. Allied to *Calleida*. Labrum somewhat elongated, rounded, and scarcely emarginate at the apex. Maxillæ slender, acute; max. palpi subacute, penultimate joint short. Mentum with a large, obtuse median tooth; lateral lobes obtuse. Type *Calleida pacifica* (Erichs.). Sp. *T. pallidicollis*, MacLeay, and *T. nigricollis*, MacLeay.

Cymbionotum, Baudi, Berl. ent. Zeitschr. 1864, p. 211. Allied to *Melænus* and *Coscinia*. Ligula coriaceous, dilated at apex; mentum with middle lobe small, bidentate; right mandible acute, left one acutely bidentate; clytra sinuated at apex; sutural angle produced. Sp. *C. collare*, n. sp. (Schaum, l. c., states that the typical species belongs to *Coscinia*, Dej.)

Stomatocæbus, MacLeay, l. c. p. 115. Allied to *Licinus*. Antennæ short. Labrum quadrate, deeply emarginate. Maxillæ acute; max. palpi long and slender, with the last joint subtruncate. Labial palpi truncate at apex. Labium bisetose in the middle; paraglossæ long and free. Mentum deeply emarginate, with no median tooth. Sp. *S. licinoides*, MacLeay.

Pachauchenius, MacLeay, l. c. p. 116. Labrum quadrate, with rounded angles. Mandibles triangular; max. palpi slender, subacute at apex. Labium corneous, and bisetose in the middle; mentum with a small, obtuse median tooth. Resembles *Acinopus*. Sp. *P. leviceps*, MacLeay.

Phymatocephalus, Schaum, Berl. entom. Zeitschr. 1864, p. 125. Allied to *Acinopus*. Head large; prothorax transverse, narrowed behind, posterior angles rounded; labrum deeply emarginate; superior spur of anterior tibiæ elongated; first joint of anterior tarsi dilated, second and third with their angles produced. Sp. *P. riehlü*, Schaum.

Delinius, Westwood, Proc. Ent. Soc. Lond. 1864, p. 3. Allied to *Steropsis*. Antennæ short, geniculate, basal joint forming one-third of their length.

Mandibles edentate; maxillæ armed with spines; palpi with the last joint somewhat securiform. Sp. *D. essingtonii*, Westw.

Spanus, Westwood, Proc. Ent. Soc. Lond. 1864, p. 3. Allied to *Axinidium*. Head small; prothorax globose; elytra gibbous, pedunculate at base; labrum deeply emarginate; mandibles acute, with a small subapical tooth; maxillæ obtuse, fringed; palpi of equal length, last joint very large, truncated; anterior and intermediate tarsi with four short, subcordate joints. Sp. *S. natalicus*, Westw.

New species :—

Notiophilus strigifrons, Baudi, Berl. ent. Zeits. 1864, p. 196, from the Piedmontese Alps.

Carabus protensus, Schaum, Berl. ent. Zeits. 1864, p. 118, pl. ii. fig. 1, from the Caucasus.

Nebria currax, Woll. Cat. Can. Col. p. 3, from the Canaries.

Odacantha micans, MacLeay, Trans. Ent. Soc. N. S. W. i. p. 107, and *Odacantha latipennis*, MacLeay, l. c. p. 108, from Port Denison.

Drypta lewisii, Newman, Zool. 1864, p. 8921, from Foo Chow.

Casnonia olivieri, Buquet, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 115, pl. i. fig. 4, from Algeria.

Helluo sulcatus, MacLeay, and *Helluo grandis*, MacLeay, l. c. p. 108, from Port Denison.

Acrogenys (g. n.) *hirsuta*, MacLeay, l. c. p. 109, pl. 9. fig. 1 (trophi), from Port Denison.

Trigonothops (g. n.) *pallidicollis*, MacLeay, l. c. p. 110, pl. 9. fig. 2 (trophi), and *T. nigricollis*, MacLeay, l. c. p. 111, from Port Denison.

Brachinus elongatus, Tournier, Mitth. Schw. ent. Ges. 1864, p. 265, from Messina.

Cymindis longicollis, MacLeay, l. c. p. 111, and *Cymindis angusticollis*, MacLeay, l. c. p. 112, from Port Denison.

Dromius. Of this genus Wollaston describes 4 new Canarian species: *Dromius amœnus*, Woll. l. c. p. 12; *D. elliptipennis*, ibid.; *D. incertus*, l. c. p. 13; and *D. pervenustus*, l. c. p. 14.

Microdaccus pulchellus, Schaum, Berl. ent. Zeits. 1864, p. 204, note, from Palestine.

Blechnus stricticollis, Baudi, Berl. ent. Zeits. 1864, p. 202, and *B. vittatus*, Baudi, l. c. p. 203, from Cyprus.

Metabletus lancerotensis, Woll. l. c. p. 17, and *M. brevipennis*, Woll. l. c. p. 18, from the Canaries.

Tarus amictus, Woll. l. c. p. 21, from the Canaries.

Sarathrocrepis minima, MacLeay, l. c. p. 111, from Port Denison.

Masoreus nobilis, Woll. l. c. p. 22, and *M. alticola*, Woll. l. c. p. 24, from the Canaries.

Scopodes denticollis, MacLeay, l. c. p. 112, from Port Denison.

Silphomorpha mastersii, MacLeay, l. c. p. 112, *S. maculigera*, MacLeay, and *S. quadrimaculata*, MacLeay, l. c. p. 113, from Port Denison.

Adelotopus apicalis, MacLeay, and *A. bimaculatus*, MacLeay, *l. c.* p. 113, from Port Denison.

Physeia latipes, Schaum, Berl. ent. Zeits. 1864, p. 117, from Mexico.

Aristus subopacus, Woll. *l. c.* p. 53, from Fuerteventura.

Cymbionotum (g. n.) *collare*, Baudi, Berl. ent. Zeits. 1864, p. 213, from Cyprus.

MacLeay (Trans. Ent. Soc. N. S. W. i. pp. 134-146) describes 19 new Australian species of *Carenum*, and gives a tabular synopsis of the 40 species now known to occur on that continent. The new species described are:—*Carenum levigatum* (p. 134); *C. anthracinum*, *C. puncticolle* (p. 135); *C. gayatinum*, *C. elongatum* (p. 136); *C. atronitens* (p. 137); *C. oblongum*, *C. violaceum* (138); *C. rectangulare* (p. 139); *C. deauratum* (p. 140); *C. foreolatum*, *C. coruscum* (p. 141); *C. affine*, *C. carinatum* (p. 142); *C. punctulatum*, *C. variosolum* (143); *C. scitulum*, *C. elegans* (p. 144); and *C. distinctum* (p. 145).

Scaraphites waterhousii, MacLeay, *l. c.* p. 147; *S. crenaticollis*, MacLeay, *ibid.*; *S. hirtipes*, MacLeay, *l. c.* p. 148: from Australia.

Gnathoxys insignitus, MacLeay, *l. c.* p. 149, from King George's Sound; *G. humeralis*, MacLeay, *l. c.* p. 150, from S. Australia; *G. barbatus*, MacLeay, *l. c.* p. 151, from S. Australia; *G. submetallicus*, MacLeay, *l. c.* p. 152, from S. Australia; *G. tessellatus*, MacLeay, *ibid.*, from Paramatta.

Dyschirius cariniceps (Truqui), Baudi, Berl. Ent. Zeits. 1864, p. 201, from Cyprus.—*Dyschirius armatus*, Woll. *l. c.* p. 8; *D. subcaneus*, Woll. *l. c.* p. 8; *D. pauxillus*, Woll. *ibid.*, from the Canaries.

Clivina sicula, Baudi, Berl. Ent. Zeits. 1864, p. 200, from Sicily.

Craspedophorus convexus, MacLeay, *l. c.* p. 114, from Port Denison.

Chlænium subcostatus, MacLeay, *l. c.* p. 114, and *C. bimaculatus*, MacLeay, *l. c.* p. 115, from Port Denison.

Stomatocælus (g. n.) *licinoides*, MacLeay, *l. c.* p. 116, pl. 9. fig. 3 (trophi), from Port Denison.

Disphæricus marginicollis, Schaum, Berl. ent. Zeits. 1864, p. 122, pl. 2. fig. 3, from Tranquebar.

Spanus (g. n.) *natalicus*, Westw. Proc. Ent. Soc. 1864, p. 3, from Port Natal. Perhaps identical with *Dyschiridium ebeninum* (Chaudoir), according to Westwood, *l. c.* p. 12.

Cratognathus æmulus, Woll. *l. c.* p. 57, from Teneriffe.

Phymatocephalus (g. n.) *riehlii*, Schaum, Berl. ent. Zeits. 1864, p. 126, from Mexico.

Pachauchenius (g. n.) *læviceps*, MacLeay, *l. c.* p. 117, pl. 9. fig. 4 (trophi), from Port Denison.

Bradycellus ventricosus, Woll. *l. c.* p. 61, from Teneriffe.

Harpalus schaumii, Woll. *l. c.* p. 58, from the Canaries.

Harpalus interstitialis, MacLeay, *l. c.* p. 117, *H. picipes*, MacLeay, *ibid.*, and *H. flavipalpis*, MacLeay, *l. c.* p. 118, from Port Denison.

Harpalus (*Ophonus*) *rayei*, Linder, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 250, from Hungary.

Dichirotrichus levistriatus, Woll. *l. c.* p. 60, from Lanzarote.

Amblystomus solskyi, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 233, from Algeria.—*Amblystomus picinus*, Baudi, Berl. ent. Zeits. 1864, p. 216, from Cyprus; *A. sardous*, Baudi, l. c. p. 217, note, from Sardinia.

Zabrus. Schaum has described the following new species:—

GROUP I. *Zabrus neglectus*, Berl. ent. Zeits. 1864, p. 175, from Guadarama. GROUP III. *Z. seidlitzii*, l. c. p. 177, from Guadarama. GROUP IV. *Z. punctiventris*, l. c. p. 179, from Greece; *Z. seriatoporus*, l. c. p. 181, from Armenia. GROUP V. *Z. corpulentus*, l. c. p. 182, from the Levant; *Z. rufipalpis*, l. c. p. 183, from Greece; *Z. melancholicus*, l. c. p. 184, from the Levant; *Z. segnis*, l. c. p. 185, from Broussa; *Z. transfuga*, ibid., from Armenia; *Z. atolus*, l. c. p. 186, from Greece; *Z. socialis* (Friv. MS.), l. c. p. 187, from Broussa. Subg. *Pelor*: *Z. foveolatus*, l. c. p. 188, from Armenia. Subg. *Polysitus*: *Z. maroccanus*, l. c. p. 189, from Morocco; *Z. puncticeps*, l. c. p. 190, from Algiers.

Zabrus (Polysitus) maroccanus, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 234, from Algeria.

Amara (Celia) aberrans, Baudi, Berl. ent. Zeits. 1864, p. 209, from Cyprus; *A. palustris* (Gené, MS.), Baudi, l. c. p. 210, note, from Sardinia.

Acorius ghilianii, Baudi, Berl. ent. Zeitschr. 1864, p. 211, from Spain.

Pristonychus picescens, Woll. l. c. p. 30, from Hierro.

Calathus cognatus, Woll. l. c. p. 34, from Gomera.

Anchomenus nichollsii, Woll. l. c. p. 40, and *A. debilis*, Woll. l. c. p. 41, from the Canaries.

Anchomenus (Agonum) curvipes, Tournier, Mitth. Schw. ent. Ges. 1864, p. 266, from Sicily.

Olisthopus palmensis, Woll. l. c. p. 42, from the Canaries.

Delinius (g. n.) *essingtonii*, Westw. Proc. Ent. Soc. 1864, p. 3, from Port Essington.

Platyderus alticola, Woll. l. c. p. 45, and *P. tenuistriatus*, Woll. ibid., from Teneriffe.

Pterostichus figuratus, Woll. l. c. p. 46, and *P. harpaloides*, l. c. p. 50, from the Canaries.

Pogonus salsipotens, Woll. l. c. p. 27, from Lanzarote.—*Pogonus fulvus*, Baudi, Berl. ent. Zeits. 1864, p. 206, from Cyprus.

Trechus deterrentus, Woll. l. c. p. 62, and *T. felix*, Woll. l. c. p. 63, from the Canaries.

Anophthalmus suturalis, Schauffuss, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 673, and *A. (Duvallius) erichsonii*, Schauff. l. c. p. 674, from Montenegro.—*Anophthalmus auberti*, Grenier, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 135, from Toulon, presenting indications of eyes.—*Anophthalmus æacus*, Sauley, ibid. p. 254, from the Cave of Campan (Pyrenees).

Anillus convexus, Sauley, l. c. p. 255, from Banyuls-sur-Mer.

Tachys centromaculatus, Woll. l. c. p. 67, from Lanzarote.

Bembidium. Wollaston describes 4 new Canarian species: *Bembidium subcallosum*, l. c. p. 71; *B. inconspicuum*, l. c. p. 72; *B. crotchii*, l. c. p. 73; *B. marginicolle*, l. c. p. 74.

Bembidium dufourii, Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 276, from near Madrid.

Bembidium (Philochthus) toletanum, Perris, l. c. p. 277, from Aranjuez.

Cilleum flavescens, McLeay, Proc. Ent. N. S. W. 1863, p. xviii, found on the beach of Middle Harbour, Sydney, below high-water mark.

DYTISCIDÆ.

General notes on the family :—

SCHAUM has published (Berl. entom. Zeitschr. 1864, pp. 105 & 106) a list of the species of *Dytiscidæ* observed in the fresh waters of Egypt. They amount only to 21; but Schaum thinks, from the uniformity of conditions prevailing throughout the extra-tropical Nile-valley, and the thorough investigation which it has received, that the list will not receive many additions. The species are as follows :—

1. *Haliphus maculipennis*, n. sp. 2. *Cybister ræselii*. 3. *Cybister africanus* (Lap.) = *C. meridionalis* (Gené) and *C. ægyptiacus* (Peyron.); Schaum regards this insect as identical with the Indian *C. tripunctatus* (Oliv.) = *C. lateralis* (Fab.). 4. *C. reichei* (Aubé); also from Senegal and the Cape. 5. *Eunectes sticticus*. 6. *Hydaticus leander* (Rossi). 7. *Colymbetes pulverosus* (St.); Schaum believes *C. australis* (Aubé) to be identical with this species. 8. *Hydrocanthus notula* (Erichs.) = *H. diophthalmus* (Reiche). 9. *Laccophilus luridus*, n. sp. 10. *Laccophilus pæcilus* (Klug). 11. *Hyphydrus grandis* (Lap.). 12. *Hydroporus musicus* (Klug). 13. *H. turgidus* (Erichs.). 14. *H. cuspidatus* (Germ.). 15. *H. cribrus*, n. sp. 16. *H. solieri* (Aubé). 17. *H. porcatus* (Klug). 18. *H. confusus* (Klug). 19. *H. pentagrammus*, n. sp. 20. *H. signatellus* (Klug). 21. *H. ceresyi* (Aubé).

Notes on known genera and species :—

Hydaticus. According to Hamlet Clark (Ent. Trans. 3rd ser. vol. ii. p. 211), *H. bihamatus* (Eschsch.) includes *H. goryi* (Aubé) and *H. scriptus* (Blanch.); it ranges from the Philippine Islands to Australia. The same author states (l. c. p. 212) that *H. 4-vittatus* (Blanch.) is probably identical with *H. vittatus* (Fab.). *H. leander* (Rossi), a southern European form of this genus, seems to be distributed over the whole of Africa; but Hamlet Clark has received specimens, differing from the ordinary type in some particulars, and which may prove to constitute a distinct species, from the White Nile (l. c. p. 217). Clark has received specimens, undistinguishable from *H. grammicus* (Sturm), from China and the Eastern Archipelago. *Hydaticus bivittatus* (Lap.), a widely distributed species in S. Africa, exhibits considerable variation, as described by Clark (l. c. p. 218). *H. stagnalis* (Fab.) occurs also at the Cape of Good Hope (Clark, l. c. p. 218).

Hydroporus. Schaum indicates (Berl. entom. Zeitschr. 1864, p. 112) that *Hydroporus platynotus* and its allied species form a peculiar group, distinguished by having the surface reticulated and dull, and the thorax and elytra with large punctures. To this group he refers 9 species, viz. :—

H. latus (Steph.); *H. platynotus* (Germ.); *H. depressicollis* (Rosenh.); *H. bicostatus* (n. sp.); *H. aubei* (Muls.); *H. laeeyni* (Fairm.); *H. opatrinus*

(Germ.); *H. hispanicus* (Rosenh.); and *H. parvicollis*, n. sp. *H. latus* includes *H. ovatus* (Ste.) and *H. castaneus* (Heer); *H. aubei* includes as varieties *H. semirufus* (Germ.) and *H. delarouzei* (Du Val); *H. laerynii* is identical with *H. coarctocollis* (Reiche); and *H. opatrinus* includes *H. cestitus* and *H. mastus* (Fairm.).

Hydroporus halensis (Fab.) is figured by Rye, Ent. Ann. 1865, fig. 5.

Hamlet Clark figures *Hydaticus decorus* (Klug) in Ent. Trans. 3rd ser. vol. ii. pl. 14. fig. 4, and also a variety of *Hydaticus vittatus* (Fab.) from N. India, l. c. p. 218, pl. 14. fig. 6.

Stierlin describes a large variety of *Agabus bipustulatus* from Sicily, which he says also occurs near Constantinople. Berl. ent. Zeitsch. 1864, p. 146.

New species:—

Haliphys maculipennis, Schaum, Berl. entom. Zeitsch. 1864, p. 107, from Egypt.

Hydroporus. Schaum (Berl. entom. Zeitsch. 1864) has described:—

Hydroporus cribrosus, l. c. p. 107, and *H. pentagrammus*, l. c. p. 108, from Egypt; *H. corpulentus*, l. c. p. 109 (= *H. saginatus*, var., Schaum olim) from the Crimea; *H. baeticus*, ibid., from Andalusia; *H. scythus*, l. c. p. 110, from the Kirghese steppes; *H. nigriceps*, ibid., from Malaga; *H. bicostatus*, l. c. p. 111, from Guadarama; and *H. parvicollis*, l. c. p. 112, from Asia Minor.

Hydroporus basinotatus, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 234, and *H. leprieurii*, Reiche, l. c. p. 235, from Algeria.—*Hydroporus hyphydrides*, Perris, ibid. p. 277, from Corsica.—*Hydroporus delectus*, Woll. Cat. Can. Col. p. 76, from Teneriffe.

Laccophilus inflatus, Woll. l. c. p. 79, from the Canaries.—*Laccophilus luridus*, Schaum, l. c. p. 107, from Egypt.

Agabus consanguineus, Woll. l. c. p. 81, from the Canaries.

Hydaticus. Hamlet Clark has described (Trans. Ent. Soc. 3rd series, vol. ii.) the following new species of this genus:—

Hydaticus bakewellii, l. c. p. 210, pl. 14. fig. 1, from Moreton Bay; *H. adamsii*, l. c. p. 211, from China; *H. aruspex*, l. c. p. 212, from China; *H. verecundus*, l. c. p. 213, of uncertain origin; *H. bowringii*, l. c. p. 214, pl. 14. fig. 3, from Australia and China; *H. ussherii*, l. c. p. 214, pl. 14. fig. 2, from Cape Coast; *H. paganus*, l. c. p. 215, from the Gold Coast; *H. matruclis*, l. c. p. 216, from Cape Coast; *H. parallelus*, l. c. p. 219, of uncertain origin; *H. nigro-marmoratus*, l. c. p. 220, from Angola; *H. fulvo-notatus*, l. c. p. 221, from Cape Coast; *H. histrio*, ibid., pl. 14. fig. 5, from N. India; and *H. nigrovittatus*, l. c. p. 222, from Japan.

GYRINIDÆ.

CLARK (Journ. of Entom. vol. ii. p. 214) has continued his Catalogue of Australasian Water-Beetles by an examination of the species of the genus *Enhydrus*. He gives the following synopsis of the species known to him:—

A. Flytra scarcely striated, smooth. 1. *E. howittii*.

B. Elytra striated.

- a. Elytra rounded at the apex. 2. *E. reichii* (Aub.); 3. *E. assimilis*; (3*. *E. sulcatus*, Wied).
 b. Elytra sinuated at the apex. 4. *E. latior*; 5. *E. rivularis*.
 c. Elytra dentate at the apex. 6. *E. oblongus* (Boisd.).

Malinowski describes the habits of *Gyrinus strigipennis* in Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 677, 680.

New species :—

H. Clark (Journ. of Ent. ii. p. 214 *et seq.*) describes *Enhydrus howittii*, from Moreton Bay (p. 215); *E. assimilis*, from Australia (p. 217); *E. latior*, from Moreton Bay (p. 217); and *E. rivularis*, from Victoria (p. 218).

PALPICORNIA.

Kraatz records the occurrence of *Cercyon marimum* (Thoms.) near Berlin. Berl. entom. Zeitsch. 1864, p. 47.

New species :—

Laccobius revelieri, Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 278, from Corsica; *Laccobius sardeus*, Baudi, Berl. ent. Zeitsch. 1864, p. 222, note, from Sardinia.

Calobius brevicollis, Baudi, l. c. p. 225, from Cyprus.

Hydrobius hæmorrhous, Woll. Cat. Can. Col. p. 92, from Grand Canary.

Limnebius mundus, Baudi, l. c. p. 223, from Cyprus; *L. gracilipes*, Woll. l. c. p. 89, and *L. punctatus*, Woll. l. c. p. 90, from the Canaries.

Chatarthria similis, Woll. l. c. p. 93, from the Canaries.

Helophorus longitarsis, Woll. Cat. Can. Col. p. 86, from Fuerteventura.

Ochthebius lapidicola, Woll. l. c. p. 87, from the Canaries.

Hydræna. Three new Canarian species are described by Wollaston: *H. sinuaticollis*, l. c. p. 87; *H. serricollis*, p. 88; and *H. quadricollis*, p. 89.

Cercyon lepidum, Woll. l. c. p. 94, from the Canaries.

STAPHYLINIDÆ.

Remarks on known genera and species :—

FAUVEL (Ann. Soc. Ent. Fr. 4^e sér. tom. iv.) has published observations upon the characters of numerous species of Chilean Staphylinidæ described by Solier from an inspection of the types in Deyrolle's collection. He also refers to species described by Fairmaire and Germain. The species noticed are :—

Falagria sulcicollis (Germain); *Gastrorhopalus niger* (Sol.); *G. elegans* (Sol.); *Blepharymenus sulcicollis* (Sol.), with which *Staphylinus cinctus* (Sol.) is identical; *Ilyobates pectoralis* (Sol.); *Tachysa fissicollis* (Fairm. et Germ.); *Euthorax ruficornis* (Sol.), probably identical with *E. scutillatus* (Fairm. et Germ.); *Aleochara bipustulata* (Sol.); *A. elongata* (Sol.), described; *A. atra* (Sol.); *Hoplandria luteiventris* (Sol.); *Oxyopoda semiflora* (Fairm. et Germ.); *O. melanocephala* (Sol.) = *O. cingulata* (Bohem.); *Polylobus maculipennis* (Sol.); *P. ? bi-impressus* (Sol.); *Homalota obscura* (Sol.); *H. angustata* (Sol.), de-

scribed; *H. obscuripennis* (Sol.); *Oligota pygmaea* (Sol.); *Myllena parvicollis* (Kraatz)=*M. dilutipes* (Fairm. et Germ.); *Habrocerus marginicollis* (Sol.), of which *Tachyp. rufescens* (Sol.) is a variety; *Quedius leiocephalus* (Sol.); *Qu. pyrostoma* (Sol.); *Philonthus impressifrons* (Sol.); *Ph. chilensis* (Sol.); *Ph. pyropterus* (Kraatz)=*Staph. rufipennis* (Sol.); *Ph. punctipennis* (Sol.); *Ph. bisulcatus* (Sol.); *Othius angustatus* (Sol.), described; *Echiaster depressus* (Sol.); *Lithocharis vittatipennis* (Fairm. et Germ.); *Lithocharis fusciventris* (Fairm. et Germ.); *Stilicus chilensis* (Sol.); *Gnathymenus apterus* (Sol.); *Stenus gayi* (Sol.); *Oxytelus sulcatus* (Sol.); *Teropalpus suturalis* (Sol.); *Trogophleus sobrinus* (Fairm. et Germ.); *Ancyrophorus obscurus* (Sol.); *A. luteipes* (Sol.); *Homalotrichus impressicollis* (Sol.); *H. striatus* (Sol.); and *Physognathus obscurus* (Sol.).

According to Kraatz, Berl. entom. Zeits. 1864, p. 132, *Oxytoda forticornis* (Fairm. et Brisout) is not distinguishable from *O. hæmorrhœa* (Sahlb.)= *promiscua* (Erichs.); *Homalota immunda* (Brisout) is identical with *H. nudiuscula* (Thoms.); *H. islandica* (Kraatz) is identical with *H. arctica* (Thoms.); *H. laticeps* (Thoms.)= *H. pumila* (Kraatz); and *Quedius tomentosomaculatus* (Cornelius) is the same as *Q. auricomus* (Kiesenw.).

Pæderus. According to Fauvel (Bull. Soc. Linn. Norm. p. 12), *Pæderus minutus* and *P. corsicus* (Gaut. des Cottés) are varieties of *P. linnophilus* (Erichs.); *P. longicollis* (Gaut.)= *P. riparius* (Linn.), l. c. p. 13; *P. ventricosus* (Gaut.)= *P. brevipennis* (Erichs.), ibid.

Kraatz records the occurrence in Germany of the following Staphylinidæ: *Homalota nudiuscula* (Thoms.); *H. thinobia* (Thoms.); *Stenus punctipennis* (Thoms.); *S. longitarsis* (Thoms.); *Coryphium foveolatum* (Thoms.); and *Oxytelus maritimus* (Thoms.). Berl. ent. Zeits. 1864, pp. 47 & 48.

Rye (Ent. M. Mag. vol. i.) has described the British species of the genus *Stenus*, of which he enumerates 62.

Rye (Ent. M. Mag. vol. i. pp. 155-160) characterizes eight British species of the genus *Bolitobius*, in which he includes *Megacronus* (Steph.).

Saulcy (Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 658) gives comparative characters of *Myrmedonia hippocrepis* (Saulcy) and *M. physogastra* (Fairm.).

Acylophorus glabricollis (Lac.) is figured by Rye, Ent. Ann. 1865, fig. 8.

New genus:—

Echidnoglossa, Woll. Cat. Can. Col. p. 530. Nearly allied to *Autalia*, but with all the tarsi 5-jointed, no visible paraglosse, and the anterior portion of the ligula very long, narrow, parallel, minutely bifid at the apex. Sp. *E. constricta*, Woll. p. 531, from Teneriffe.

New species:—

Autalia puncticollis, Sharp, Proc. Ent. Soc. Lond. 1864, p. 45, from Perthshire and Shetland.

Palagria chilensis, Fauvel, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 118, from Chili.

Myrmedonia cavifrons, Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 279, from Algiers.—*M. barbara*, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 638, from Bone in Algeria.

Coproporus gallicus, Perris, l. c. p. 280, France.

Phytosus minyops, Woll. l. c. p. 531, from Fuerteventura.

Phlaopora corticina, Woll. l. c. p. 533, from the Canaries.

Tachyusa simillima, Woll. l. c. p. 534, from the Canaries.

Tachyusa. An imperfect specimen of apparently an undescribed species of this genus is mentioned by Fauvel as occurring among Solier's types of Chilian Staphylinidæ, l. c. p. 120.

Xenomma muscicola, Woll. l. c. p. 535, from Grand Canary.

Homalota. Wollaston describes 15 new Canarian species of this genus:

Homalota rufofusca, l. c. p. 535; *H. rufobadia*, ibid.; *H. trogophlæoides*, l. c. p. 536; *H. amnicola*, ibid.; *H. amnigena*, l. c. p. 537; *H. persimilis*, l. c. p. 538; *H. cursitans*, l. c. p. 540; *H. subsericea*, ibid.; *H. angustissima*, l. c. p. 541; *H. misella*, ibid.; *H. aleocharoides*, l. c. p. 542; *H. læta*, l. c. p. 543; *H. subcoriaria*, l. c. p. 546; *H. terricola*, l. c. p. 548, and *H. waterhousii*, ibid.

Oxyptoda brevipennis, Woll. l. c. p. 550, and *O. æthiops*, Woll. l. c. p. 551, from the Canaries.—*O. investigatorum*, Kraatz, Berl. entom. Zeitschr. 1864, p. 130, from the seashore at Swinemünde.

Aleochara littoralis, Woll. l. c. p. 552, and *A. funebris*, Woll. l. c. p. 553, from the Canaries.

Oligota castanea, Woll. l. c. p. 555, from the Canaries.

Mycetoporus. Of this genus Wollaston describes 3 new Canarian species: *Mycetoporus rufus*, l. c. p. 558; *M. monilicornis*, l. c. p. 559; and *M. solidicornis*, ibid.

Bolitobius luridus, Woll. l. c. p. 560, and *B. filicornis*, Woll. ibid., from the Canaries.

Polylobus? læviventris, Fauvel, l. c. p. 122, from Chili.

Ocypus siculus, Stierlin, Berl. ent. Zeitsch. 1864, p. 146, from Sicily.

Ocypus. Wollaston describes 6 new Canarian species of this genus: *Ocypus affinis*, l. c. p. 566; *O. umbricola*, ibid.; *O. curtipes*, l. c. p. 567; *O. atratus*, ibid.; *O. subænescens*, ibid.; and *O. punctatissimus*, l. c. p. 568.

Philonthus. Wollaston describes *Philonthus marcidus*, l. c. p. 571, *P. tellus*, l. c. p. 576, and *P. xantholinoides*, l. c. p. 577, from the Canaries.

Othius brachypterus, Woll. l. c. p. 580, and *O. philonthoides*, l. c. p. 581, from the Canaries.

[*Othius*] *Othius fasciatus*, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 253, from Virginia.

Homrocerus spinulosus, Solsky, Berl. ent. Zeits. 1864, p. 375, Taf. iv. figs. 8 & 9, from W. Africa.

Staphylinus capitatus, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 65, from Canada West.

Philonthus varipennis, Scriba, Berl. ent. Zeits. 1864, p. 378 = *P. placidus*, var. *major* (Erichs.).

Euryporus princeps, Woll. l. c. p. 561, from Grand Canary.

Quedius angustifrons, Woll. l. c. p. 563, and *Q. megalops*, Woll. l. c. p. 564, from the Canaries.

Achenium subcæcum, Woll. l. c. p. 581, and *A. salinum*, Woll. l. c. p. 582, from Lanzarote.

Scopæus trossulus, Woll. l. c. p. 585, and *S. nigellus*, Woll. ibid., from the Canaries.

Lithocharis. The following new Canarian species are described by Wollaston:—*Lithocharis quadriceps*, l. c. p. 586; *L. subcoriacea*, ibid.; and *L. brevipennis*, l. c. p. 580.

Sunius. Four new Canarian species are described by Wollaston, viz.:—*Sunius myrmecophilus*, l. c. p. 590; *S. megacephalus*, ibid.; *S. dimidiatus*, l. c. p. 591; and *S. pallidulus*, ibid.

Stenus calcaratus, Scriba, Berl. ent. Zeits. 1864, p. 380, from Hamburg; *Stenus æneotinctus*, Woll. l. c. p. 592, from the Canaries.

Stenus. Rye describes as new British species *Stenus debilis* (Dietrichsen MS.?), Ent. M. Mag. vol. i. p. 42, and *S. erichsoni* (Janson, MS.) = *flavipes* (Erichs. nec Steph.), l. c. p. 108.

Bledius irroratus, Fauvel, l. c. p. 127, from Chili.

Bledius. Wollaston describes from the Canaries,—*Bledius januvianus*, l. c. p. 593; *B. cornutissimus*, l. c. p. 594; and *B. galeatus*, ibid.

Trogophlaeus ruficollis, Woll. l. c. p. 601, and *T. bledioides*, Woll. ibid., from the Canaries.

Phlorinum floricola, Woll. l. c. p. 602, from the Canaries.

Homalium sculpticolle, Woll. l. c. p. 602, from Teneriffe and Palma.

Omalium rugulipenne, Rye, Ent. Ann. 1864, p. 58.

Metopsia cimicoides, Woll. l. c. p. 605, from Teneriffe.

PSELAPHIDÆ.

De Sauley (Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 649), referring to a statement of Grenier's that the development or non-development of the eyes in *Mucherites* (*Linderia*) *marice*, as found in the Cave of Villefranche, depends upon the degree of light to which the specimens are exposed, maintains that the individuals with developed eyes are *males*, and those with the eyes very small or entirely deficient are *females*. Grenier, in reply (l. c. p. 650), maintains that the characters upon which de Sauley has founded his genus *Linderia*, and those which he regards as indicative of sex, such as the development of the eyes and wings and the structure of the antennæ and palpi, are due solely to the influence of light upon the development of the larvæ.

King remarks (Trans. Ent. Soc. N. S. W. vol. i. p. 106) that *Narcodes pulchra* is the male of *N. varia*, and that *Bryaxis linearis* and *sculpta* belong to the genus *Euplectus*.

New species and genera:—

Enoptostomus, g. n., Schaum, in Woll. Cat. Can. Col. p. 528. Allied to *Ctenistes* and *Centrotona*; antennæ approximate, inserted on the sides of a frontal tubercle, last four joints in ♂, last two in ♀, thickened; max. palpi 4-jointed (?), joint 2 much arcuate, slightly thickened at apex, 3 much dilated on each side, semilunar, 4 dilated into a transverse cone; tarsi with two equal claws. Sp. *E. wollastoni*, Schaum, l. c. p. 529, from Teneriffe and Gomera.

Camaldus, g. n., Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 637. Allied to *Centrotona*; antennæ elongate, clavate; maxillary palpi elongate, 4-jointed, first very short, second elongate, slender, third inflated, fourth

minute, conical, almost lateral; tarsi 3-jointed, first very short. *Sp. C. villosulus*, Fairm. *l. c.* p. 638, from Constantine.

King has described (Trans. Ent. Soc. N. S. W. vol. i.) the following new species of *Pselaphidæ* inhabiting New South Wales:—*Tmesiphorus vernalis* and *Tmesiphorus macleayi* (p. 102); *Tyrus subulatus* (p. 103, pl. 7. fig. 6, palpus); *Tychus nigricollis* (p. 103, pl. 7. fig. 7, antenna); *Batrissus elizabethæ* (p. 104); *Bryaxis armitagei* (p. 104, pl. 7. fig. 15, antenna); *Bryaxis clavatula* (p. 104, pl. 7. fig. 12, antenna); and *Bryaxis elizabethæ* (p. 105, pl. 7. figs. 8 & 9, antenna and thorax).

Centrotoma rubra, Sauley, Ann. Soc. Ent. Fr. 4^e série, tome iv. p. 258, from near Banyuls.

Pselaphus longicornis, Sauley, *l. c.* tome iii. p. 656, France.

Ctenistes godarti, Sauley, *l. c.* tome iv. p. 258, from Portugal.

Tychus fournieri, Sauley, *l. c.* p. 259, from Draguignan.

Bythinus massanae, Sauley, *l. c.* p. 260, from Massane; *B. hypogæus*, Sauley, *l. c.* tome iii. p. 657, France.

Euplectus monticola, Woll. Cat. Can. Col. p. 527, from Teneriffe.

Articerus duboulayi, Waterhouse, Ent. M. Mag. vol. i. p. 149, from Swan River, found in an ants' nest.

PAUSSIDÆ.

Cerapterus kirbii, sp. n., Westw. Ent. Trans. 3rd ser. vol. i. Proc. p. 189, from Natal.

Paussus spencii, sp. n., Westw. *l. c.* p. 190, from the East Indies?—*P. curtisii*, sp. n., Westw. *l. c.* p. 190, from Natal.

SCYDMENIDÆ.

New genera:—

KING (Trans. Ent. Soc. N. S. W. p. 91) gives the following synopsis of the Australian genera of *Scydmenidæ*. Four out of the six genera are new:—

A. Posterior legs contiguous.

a. Labial palpi biarticulate.

aa. Mandibles with two teeth and membranous edge

Phagonophana, g. n.

bb. Mandibles with one tooth

Scydmenilla, g. n.

b. Labial palpi triarticulate

Psepharobius, g. n.

B. Posterior legs distant.

c. Fourth joint of maxillary palpi conical

Scydmenus.

d. Fourth joint of max. palpi globular.

dd. Mandibles alike

Megaladerus.

ee. Mandibles unlike

Heterognathus, g. n.

Geodytes, g. n., Sauley, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 256. Allied to *Cephennium*. Blind, apterous, narrow; antennæ clavate; elytra leaving uncovered the apex of the abdomen; mesosternum keeled. *Sp. Geodytes cæcus*, Sauley, *l. c.* p. 256, from Banyuls, under a large stone.

New species:—

Phagonophana (g. n.) *kingii*, King, Trans. Ent. Soc. N. S. W. i. p. 92, pl. 6. fig. A. 1-4, from New South Wales.

Scydmaenilla (g. n.) *pusilla*, King, *l. c.* p. 93, pl. 6. fig. B. 1-2, from Paramatta.

Psepharobius (g. n.) *elongatus*, King, *l. c.* p. 94, pl. 6. fig. C. 1-2, from Paramatta.

Scydmaenus gulosus, King, *l. c.* p. 94, *S. corticis*, King, *ibid.*, *S. paramatensis*, King, *l. c.* p. 95, pl. 7. fig. 5, and *S. neglectus*, King, *l. c.* p. 95, from New South Wales.

Meguladerus inconspicuus, King, *l. c.* p. 96, pl. 6. fig. E. 1-3, from Paramatta.

Heterognathus (g. n.) *carinatus*, King, *l. c.* p. 97, pl. 6. fig. D. 1, 2, 4, & pl. 7. fig. 4, *H. gracilis*, King, *l. c.* p. 97, pl. 7. fig. 3, *H. assimilis*, King, *l. c.* p. 97, *H. geniculatus*, King, *l. c.* p. 98, *H. princeps*, King, *l. c.* p. 98, pl. 7. figs. 1, 2, *H. armitagei*, King, *l. c.* p. 98, and *H. macleayi*, King, *l. c.* p. 99, from New South Wales.

Scydmaenus chrysocomus, Sauley, *l. c.* p. 256, from Geneva, found with ants ; *Scydmaenus cornutus*, Sauley, *l. c.* tome iii. p. 654, France.

Leptomastax raymondi, Sauley, *l. c.* tom. iv. p. 257, from Fréjus.

SILPHIDÆ.

Notes on known species :—

Catops. De Marseul has published the characters of several species of this genus. L'Abeille, tome i. pp. xi, xii.

Kraatz repeats Thomson's remark, that *Catops pilicornis* (Thoms.) is identical with *C. longulus* (Kelln.). Berl. ent. Zeitschr. 1864, p. 133.

Scriba (Berl. ent. Zeitschr. 1864, p. 377) characterizes *Necrophorus fossor* and *N. gallicus*, and indicates, as a probable means of recognizing the females of the two species, that in the larger specimens of that sex the posterior trochanters are emarginate and furnished with a tooth, as in the males of *N. fossor*. These characters are wanting in the smaller females; and Scriba believes the former to belong to *N. gallicus*, and the latter to *N. fossor*.

Kraatz records the occurrence in Germany of the following species described by Thomson: *Necrophorus microcephalus*, *Colon delarouzei*, and *C. simplex*; and *C. serripes*, var. *kraatzii* (Tourn.). Berl. ent. Zeitschr. 1864, pp. 47, 48.

Norguet records his finding numerous specimens of *Adelops wollastonii* (Waterh.) upon decaying roots of plants in a particular bed in his garden at Lille, and subsequently obtaining great quantities of the same species by burying rotten apples in the ground. He obtained the *Adelops* only from one bed. Bull. Soc. Ent. Fr. 1863, p. xli.

New species :—

Choleva. Baudi describes the following new species from Cyprus: *Choleva amplicollis*, Berl. ent. Zeitschr. 1864, p. 226; *C. notaticollis*, *l. c.* p. 227; *C. anomala*, *l. c.* p. 229.

Choleva subcostata, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 236, from Algeria.

Catops erro, Reiche, *l. c.* p. 236, from Algeria.—*C. dorsiger*, De Marseul, L'Abeille, tome i. p. xii (April 1864), from Beirouth.—*C. clathratus*, Perris, 1864. [VOL. I.] 2 B

Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 281, from Spain.—*C. putridus*, Woll. Cat. Can. Col. p. 96, from Palma.

Catopsimorphus rougeti, Saulcy, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 653 (= *C. fairmairei* ♀, Delarouze); France.

Apatetica nitiduloides, Westw. Proc. Ent. Soc. Lond. 1864, p. 11, from Java.

ANISOTOMIDÆ.

Fauvel has examined the structure of *Sphærius acaroides* (Waltl). He describes the lingua as narrower than indicated by Hoffmann, and clearly trapezoidal, and mentions some other minor differences of form in this organ:—The right mandible is deeply notched or bifid at the apex; the maxillæ are falciform, narrow, and but slightly curved at the apex; they bear on the inside of the apical part four or five small spines, and on the lower part a few stiff hairs. The antennæ have the first two joints thick and short; the third long, slender, and scarcely enlarged at the apex; the three following small, bead-like; the seventh and eighth depressed and transverse; and the last three forming an oblong club. The anterior femora have a large tooth beneath; the tarsi are 3-jointed, with the first two joints very short; the claws are unequal, with two bristles at their base. From his examination of this curious microscopic Beetle, Fauvel would regard it as the type of a distinct group (*Sphæriides*), to be placed between the *Clambides* and the *Trichopterygides*, as proposed by Schaum. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 131–132, pl. 1. fig. 11 a–f.

Laboulbène describes and figures *Anisotoma* (*Leiodes*) *cinnamomea* and its transformations in his memoir on Tuberivorous Insects (Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 90, pl. 2. figs. 18–27). The same author (l. c. p. 92) describes the larva of *Anisotoma ferruginea*, and mentions *A. picea* as a tuberivorous species on the authority of Vittadini.

Rye remarks (Ent. M. Mag. vol. i. p. 167) that *Anisotoma ornata* (Fairm.) is identical with *A. litura* (Steph.).

Rye describes *Liodes castanea* (Herbst), recently taken at Rannoch, and indicates the differences between *L. axillaris* (Gyll.) and *L. humeralis* (Fab.). Ent. M. Mag. vol. i. p. 118.

Perris mentions *Agaricophagus cephalotes* as a truffle-eating Beetle. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 307.

Anisotoma oceanica, sp. n., Woll. Cat. Can. Col. p. 99, from Teneriffe.

Agathidium globulum, sp. n., Woll. l. c. p. 99, and *A. integricolle*, Woll. l. c. p. 100, from the Canaries.

Clambus complicans, sp. n., Woll. l. c. p. 101, from the Canaries.

TRICHOPTERYGIDÆ.

Acrotrechis matthewsii, sp. n., Woll. Cat. Can. Col. p. 103, from Palma.

Trichopteryx lethierryi, sp. n., Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 237, from Algeria.

SCAPHIDIIDÆ.

Scaphidium bimaculatum, sp. n., MacLeay, Trans. Ent. Soc. N. S. W. i. p. 119, from Port Denison.

Scaphisoma poupillieri, sp. n., Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 238, from Algeria.

HISTERIDÆ.

Notes on known species :—

Perris has published an observation made by Revelière in Corsica upon the habits of *Hister pustulosus* (Gené). This insect feeds upon the caterpillar of an *Agrotis*, which it drags from holes in the ground and kills, although the victim is often four times the size of the *Hister*. Revelière found that when one *Hister* had captured a caterpillar, others came from various quarters to dispute its possession; he states also that he never met with *Hister pustulosus*, except in ground which exhibited the burrows of the *Agrotis*-larva. (Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 304.)

Baudi considers that *Platysoma levicolle* (Küst.) = *algiricum* (Luc.), Berl. ent. Zeits. 1864, p. 231, note; and describes a Piedmontese var. of *Hister cadaverinus*, l. c. p. 232, note.

Onthophilus ezaratus (Illiger). Waterhouse (Proc. Ent. Soc. Lond. 1864, p. 4) has found in his own British collection a specimen of this insect mixed with specimens of *O. sulcatus*, but with no indication of its origin. He calls the attention of English entomologists to the characters by which this species is distinguished from its allies.

New species and genera :—

Xenonychus, g. n., Woll. Cat. Can. Col. p. 179. Nearly allied to *Saprinus*; body very convex beneath; eyes small, concealed beneath the lateral angles of the forehead; antennæ short, basal joint with very long hairs; legs very robust, posterior pair very distant, arising from elevated conical coxæ; anterior tibiae deeply tridentate at the apex, thence minutely crenulate; tarsal claws very long, slender, and setiform; lower surface and inner surfaces of intermediate and posterior tibiae with immensely long hairs. Sp. *Xenonychus fossor*, Woll. l. c. p. 181. From Fuerteventura.

Teretrius cylindricus, Woll. Cat. Can. Col. p. 164, from Teneriffe.

Hister canariensis, Woll. l. c. p. 165, from Teneriffe.

Saprinus. Of this genus Wollaston describes nine new Canarian species, namely: *Saprinus nobilis*, l. c. p. 167; *S. osculans*, l. c. p. 168; *S. fortunatus*, l. c. p. 172; *S. ignobilis*, l. c. p. 173; *S. minyops*, l. c. p. 174; *S. angulosus*, l. c. p. 175; *S. mundus*, l. c. p. 176; *S. erosus*, l. c. p. 177; and *S. lobatus*, l. c. p. 178.

Saprinus ater, Macleay, Trans. Ent. Soc. N. S. W. i. p. 118, from Port Denison.

PHALACRIDÆ.

Phalacrus flavangulus, sp. n., Chevr. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 599, from Cuba.

Ohbrus erithacus, sp. n., Chevr. l. c. p. 599, from Cuba.

Ohbrus. Of this genus Wollaston describes three new Canarian species: *Ohbrus florum*, l. c. p. 106; *O. congener*, l. c. p. 107; *O. subæreus*, ibid.

NITIDULIDÆ.

MURRAY (Linn. Trans. vol. xxiv. p. 224) gives the following as the essential character of the *Nitidulidæ*, as limited by him :—

"Ventral segments free, five in number, the first visible both at the middle and sides; some of the dorsal segments membranous. Antennæ more or less clavate, but not geniculate. Tarsi five-jointed, in general dilated; fourth article the smallest, usually very minute. Anterior coxæ transverse, not prominent; anterior cotyloid cavities transverse, oblique, more or less open, and tapering towards the outer side." This diagnosis excludes several forms which have been referred to the family by various authors. *Cybocephalus*, placed with the *Nitidulidæ* by Erichson, and continued in that position by Lacordaire, is excluded by Murray, partly because it does not present the appearance of a member of this family, but rather resembles *Agathidium*, and partly because it exhibits differences in certain important characters, especially the structure of the lower surface of the thorax and the acetabula of the anterior coxæ, and the possession of only four joints in the tarsi, instead of five. The relationship of *Cybocephalus* to the Anisotomidæ seems to have been strongly impressed upon Lacordaire, who refers particularly to the similarity in habits, and especially to the possession by *Cybocephalus* of the power of rolling itself up into a ball.

The Peltidæ and Trogositidæ differ from the Nitidulidæ in the structure of the maxillæ and tarsi, the former being bilobed, the latter having their first joint the smallest. The insects of these groups have already been separated as a distinct family by Lacordaire and others. The other group to which the author adverts is that of the *Rhizophagides*, which he regards as intermediate between *Ipides* and Trogositidæ. *Rhizophagus* differs from the true Nitidulidæ in having a bilobed maxilla of Trogositidan structure, and the tarsi less dilated than in the Nitidulidæ, and heteromerous (Murray says four-jointed) in the males.

With regard to the geographical distribution of the family, Murray remarks (*l. c.* pp. 228 & 229) that some species are now cosmopolitan, but have probably been introduced in many places by the intervention of man. Of certain genera, numerous species of which occur in some particular region, single species are frequently met with in widely distant localities—as, for instance, *Stelidota*, which appears to be an American form, but of which one species is known from Tahiti, one from Celebes, and two from Madagascar, the last closely allied to North American species, and the first to a West-Indian one. *Lobiopa*, an American genus, has one species in Senegal; *Platychora* and *Perilopa* occur both in Africa and Brazil; and *Prometopia* in North and South America, Africa, India, and the Philippine Islands. Other genera are scattered in single species almost all over the world, and the only extensive genera confined to one hemisphere are the American genera *Colastus* and *Camptodes*.

Murray (Linn. Trans. vol. xxiv. p. 230) gives the follow-

ing tabular view of the tribes into which he divides the *Nitidulariæ* :—

- I. Labrum not concealed by the prolonged epistome.
 - A. Two or three segments of the abdomen exposed.
 - * Maxillæ with two lobesBRACHYPTERIDÆ.
 - † Maxillæ with one lobeCARPOPHILIDÆ.
 - B. The last dorsal segment (pygidium) alone exposed.
 - * Prothorax not much shorter below than above..NITIDULIDÆ.
 - † Prothorax much shorter below than aboveSTRONGYLINÆ.
- II. Labrum concealed by the prolonged epistome.IPIDÆ.

Of these tribes only the first two are described in the published portion of the memoir. They are divided as follows :—

Tribe I. BRACHYPTERIDÆ.

Genera :—*Cercus* (Latr.), *l. c.* p. 231. [Subgenera: *Anomæocera* (Shuck.), *Amartus* (Lec.), *Cercus* (pr.), *Heterhelus* (Murr.).] *Brachypterus* (Kug.), *l. c.* p. 240. [Subgenera: *Brachypterus* (pr.), *Heterostomus* (Duv.), *Brachyleptus* (Motsch.).] *Calonecerus* (Thoms.), *l. c.* p. 251.

Tribe II. CARPOPHILIDÆ.

Section 1. *Late-fimbriata*. Abdomen flat; exposed dorsal portion usually much longer and never shorter than thorax; fimbriæ well-marked on the pygidium and generally on all the dorsal segments.

Genera :—*Colastus* (Erichs.), p. 257 [Subgenera *Cyllopodus* (Murr.), *Colastus* (pr.)]. *Brachypeplus* (Erichs.), p. 286 [Subgenera *Onicotis* (Murr.), *Tasmus* (Murr.), *Brachypeplus* (pr.), *Leioneplus* (Murr.), *Liparoepplus* (Murr.)]. *Grammophorus* (g. n.), p. 309. *Adocimus* (g. n.), p. 310. *Cilleus* (Lap.), p. 311. *Ithyphenes* (g. n.), p. 316. *Orthogramma* (g. n.), p. 318. *Halepopeplus* (g. n.), p. 324. *Campsopyga* (g. n.), p. 327. *Hypodetus* (g. n.), p. 328. *Prosopius* (g. n.), p. 320. *Macrostola* (g. n.), p. 331. *Conotelus* (Erichs.), p. 333.

Section 2. *Anguste-fimbriata*. Abdomen slightly convex; exposed dorsal portion shorter than thorax; fimbriæ absent or very narrow and subparallel to the margin.

Genera :—*Ctilodes* (g. n.), p. 339. *Carpophilus* (Steph.), *l. c.* p. 341 [Subgenera *Urophorus* (Murr.), *Carpophilus* (pr.), *Myothorax* (Murr.), *Ecnomorphus* (Motsch.), and *Microanthus* (Murr.)]. *Stauroglossus* (g. n.), p. 398. *Eidocolastus* (g. n.), p. 399. *Haptoncus* (g. n.), p. 401. *Tetrisus* (g. n.), p. 404. *Trimeus* (Motsch. MS.), p. 405. *Somaphorus* (g. n.), p. 407. *Ecnomæus* (Erichs.), p. 408. *Mystrops* (Erichs.), p. 410.

The following known species of this family are figured by Murray, *loc. cit.* plates 32–36: *Cercus pedicularius* (Linn.), pl. 32. fig. 1; *Brachypterus quadratus* (Creutz.), pl. 32. fig. 6; *B. tinctus* (Mann.), pl. 32. fig. 8; *Calonecerus wallacei* (Thoms.), pl. 32. fig. 9; *Colastus ruptus* (Erichs.), pl. 34. fig. 1c* (anterior tibia of ♂); *C. posticus* (Erichs.), pl. 34. fig. 1; *C. amputatus* (Erichs.), pl. 34. fig. 3; *Cilleus castaneus* (Lap.), pl. 35. fig. 2; *C. obscurus* (Lap.), pl. 35. fig. 3; *C. linearis* (Erichs.), pl. 35. fig. 4; *Carpophilus marginellus*

(Motsch.), pl. 33. fig. 1; *C. hemipterus* (Linn.), pl. 32. fig. 10; *C. melanopterus* (Erichs.), pl. 32. fig. 11; *Eidocolastus plagiatipennis* (Motsch.), pl. 33. fig. 6; *Ecnomæus planus* (Erichs.), pl. 35. fig. 9.

Mr. Fisher states that the cole-seed crops in the district of Ely were greatly injured last summer by a small beetle, said by Newman to be *Meligethes picipes*. The insects devour the interior organs of the unexpanded flower, and thus prevent the formation of seed. Entomologist, vol. ii. p. 40.

New genera :—

Grammophorus, Murr. l. c. p. 309. Head broad, left mandible bifid at apex, right one acute; antennæ rather long, club oblong-ovate; prothorax transverse-quadrate, with smooth raised lines on the disk, and the sides ciliated; scutellum large, acutely triangular; elytra covering base of third abdominal segment, first two segments abbreviated; anterior tibiæ armed, posterior spinulose on outer margin. Sp. *G. cælatus*, Murr., from Columbia.

Adocimus, Murr. l. c. p. 310. Allied to *Cillæus*; eyes nearly reaching base of head; posterior angles of thorax rounded; lateral fimbriæ small, but the anterior margin of each segment with a broad fimbria; coxæ distant, especially the intermediate ones. Sp. *A. bellus*, Murr. p. 311, pl. 36. fig. 5, from Mysol.

Ithyphenes, Murr. l. c. p. 316. Allied to *Cillæus*; body elongate, much depressed; head broad, epistome porrect and notched; eyes small; antennary furrows short; maxillæ uncinatæ at base; abdomen with three segments exposed, segments nearly equal. Sp. *I. gnatho*, Murr. p. 317, pl. 36. fig. 2, from New Guinea.

Orthogramma, Murr. l. c. p. 318. Body linear; head elongate, epistome porrect, notched and denticulate; elytra striate; abdomen with its segments nearly equal, last four exposed. Sp. *O. longiceps*, Murr., &c. (see p. 376).

Ealepopeplus, Murr. l. c. p. 324. Allied to *Brachypeplus*; labrum simple, transverse; epistome slightly porrect; thorax with rounded angles; abdomen with first two segments short, fifth largest, three segments exposed; tibiæ scarcely channeled at apex. Sp. *H. bipustulatus*, Murr., &c. (see p. 377).

Campsopyga, Murr. l. c. p. 327. Eyes large; mandibles bicuspidate; abdomen with second segment short, last segment long, the rest nearly equal, three segments exposed; fimbriæ of last segment widest in front, of the rest widest behind; tarsi dilated. Sp. *C. pallidipennis*, Murr. p. 328, pl. 36. fig. 8, from Venezuela.

Hypodetus, Murr. l. c. p. 328. Eyes large; epistome porrect; mandibles bicuspidate; ligula narrow; abdomen narrowed behind, segments equal, except the last, which is largest; fimbriæ nearly parallel, narrower behind on pygidium; tarsi much dilated. Sp. *H. xanthurus*, Murr. p. 329, pl. 35. fig. 6, from Brazil?

Prosopus, Murr. l. c. p. 330. Eyes large; epistome somewhat porrect; mandibles simple; thorax narrow; abdomen with second segment short, last long, two segments and apex of a third exposed; fimbriæ subparallel; apex deeply emarginate. Sp. *P. subæneus*, Murr. p. 331, pl. 33. fig. 10, from Caffaria.

Macrostola, Murr. l. c. p. 331. Allied to *Conotelus*; eyes very large;

epistome porrect; ligula narrow, with narrow membranaceous lobes; elytra long; abdomen with three segments exposed, scarcely fimbriate, second short, apical longest. Sp. *M. straminea*, Murr. p. 332, pl. 35. fig. 7, from Mexico, and *M. lutea* (Moritz), Murr. l. c. p. 333, from Cumana.

Ctilodes, Murr. l. c. p. 339. Allied to *Carpophilus*; eyes not reaching base of head; epistome deeply excavated; labrum bifid, membranaceous, bearded, elongate; mandibles large, bicuspidate, dentate within; abdomen almost without fimbriæ, two segments exposed, second and third short. Sp. *C. bostrichoides*, Murr. p. 340, pl. 36. fig. 1, from Morty.

Stauroglossicus, Murr. l. c. p. 398. Allied to *Carpophilus*; first three segments of abdomen equal, the rest shorter; maxillæ very broad, subquadrate; ligula with horizontal lobes. Sp. *S. terminalis*, Murr. p. 398, pl. 33. fig. 4, from Victoria; *S. lepidus* l. c. p. 399, from Batchian.

Eidocolastus, Murr. l. c. p. 399. Allied to *Carpophilus*; body flat; head broad; epistome very slightly produced; maxillæ truncate at apex; abdominal segments equal, except the last, which is longer. Sp. *E. dilutus* (Motsch.), &c.

Haptoncus, Murr. l. c. 401. Allied to *Carpophilus*; eyes of moderate size, reaching base of head; labrum bilobate; paraglossæ membranaceous, folded; labial palpi with last joint large; abdomen with the first and last segments longest, the rest equal, two exposed, fimbriæ not visible. Sp. *H. consolor* Murr., &c. (see p. 377).

Tetrisus, Murr. l. c. p. 404. Allied to *Carpophilus*; two segments of abdomen exposed, penultimate with small fimbriæ, first four equal in length; ligula minute, paraglossæ prominent or represented by a few hairs. Sp. *T. cholevoidea*, Murr. p. 404, pl. 33. fig. 2, and *T. hydroporoides*, Murr. l. c. p. 405, pl. 35. fig. 10, from Borneo.

Trimenius (Motsch. MS.), Murr. l. c. p. 405. Broad; eyes large; antennary furrows short; labrum bifid; epistome porrect; elytra large, not striate; abdomen with two segments exposed, the last longest, the rest nearly equal, fimbriæ small. Sp. *T. ad ressus*, Murr. p. 406, pl. 36. fig. 4, from Borneo, &c.; *T. angustatus*, Murr. l. c. p. 407, from Macassar, &c.

Somaphorus, Murr. l. c. p. 407. Allied to preceding; no epistome; abdominal segments nearly equal, except the first, fimbriæ wanting. Sp. *S. ferrugineus*, Murr. p. 408, pl. 36. fig. 7, from the Philippines?

Heterobrachium, Woll. Cat. Can. Col. p. 108. Allied to *Brachypterus*; prothorax more quadrate; last joint of maxillary palpi subacicular, truncate at apex; legs long, especially in ♂, slender; femora angulato-dentate at apex; anterior tibiæ obliquely truncate, with a large, curved apical spine, anterior and intermediate tibiæ curved in ♂. Sp. *H. longimanum*, Woll., from Teneriffe and Palma.

Thyreosoma, Chev. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 602. Resembling *Lobiopa* and *Scelidota* in form, but placed doubtfully in the present family; antennæ of nine joints, first short, inflated, second largest, third and fourth triangular, remainder small, moniliform, except the club, which is oblong, truncated, pilose; tarsi three-jointed, posterior elongated, two-jointed; claws slender, unequal; anterior coxæ large, transverse, bilobed in front, angular externally. Sp. *T. circulare*, Chev., from Cuba.

New species :—

Cercus. Murray describes the following new species of this genus :—(ANOMEOCERA) *Cercus ochraceus* (Dej.), l. c. p. 233, from Volhynia : (HE-TERHELUS) *C. longipennis* (Motsch.), l. c. p. 234, from Dauria ; *C. pennatus*, l. c. p. 235 (= *C. pusillus* Melsh. ?), from North America : (CERCUS, pr.) *C. crinitus*, l. c. p. 237, from Tennessee ; *C. exilis* (Laf.), l. c. p. 238, from Cumana.

Brachypterus. Murray describes :—(BRACHYPTERUS, pr.) *Brachypterus pal-lipes*, l. c. p. 243, from Algeria ; *B. lucasii*, l. c. p. 244 (= *B. pubescens*, Luc.), from Algeria ; *B. rotundicollis*, ibid., from Syria and South Europe ; *B. troglodytes*, ibid., from California, *B. globularius* (Reiche), l. c. p. 245, from North America ; *B. flavipes*, l. c. p. 245, from Brazil : (BRACHYLEPTUS) *B. antirrhini*, l. c. p. 248, from Algeria ; *B. ferrugatus*, l. c. p. 250, from Oregon.

Brachypterus curtulus, Woll. l. c. p. 110, from the Canaries.

Calonecerus laticollis, Murray, l. c. p. 253, from Sarawak.

Colastus. Murray describes :—(CYCLOPODES) *Colastus scutellaris*, l. c. p. 259, from Mexico ; *C. bisignatus*, l. c. p. 260, from Venezuela ; *C. niger*, l. c. p. 261, from Brazil : (COLASTUS, pr.) *C. fernidus*, l. c. p. 262, from the Amazons ; *C. heydeni*, ibid., from Brazil ; *C. bohemani*, l. c. p. 263, from Brazil ; *C. dorsalis*, l. c. p. 264, from Ega ; *C. hilaris*, l. c. p. 266, from Cumana ; *C. vetustus*, l. c. p. 267, from Brazil ; *C. consobrinus*, l. c. p. 268, from Brazil ; *C. dispar*, ibid., from Mexico ; *C. brevicollis*, l. c. p. 271, from the Amazons ; *C. latus*, l. c. p. 272, pl. 34. fig. 2, from Mexico ; *C. tonsus*, l. c. p. 273, from Brazil ; *C. thalestris*, ibid., from the Amazons ; *C. pubescens*, ibid., from Brazil ; *C. simplex*, l. c. p. 274, from Mexico and Brazil ; *C. ater*, l. c. p. 275, from Venezuela ; *C. fulvipes*, ibid., from Brazil ; *C. pocularius*, l. c. p. 276, from Brazil ; *C. signaticollis*, ibid., from Santa Catharina ; *C. decrus*, l. c. p. 279, *C. ferrugineus*, l. c. p. 280, *C. striaticollis*, ibid., and *C. triangularis*, l. c. p. 282, from Brazil.

Brachypeplus. Murray describes :—(ONICOTIS) *Brachypeplus auritus*, l. c. p. 288, pl. 34. fig. 10, from New South Wales, in Bees' nests : (TASMUS) *B. binotatus*, l. c. p. 290, pl. 34. fig. 5, from Victoria ; *B. blandus*, l. c. p. 291, from Victoria ; *B. macleayi*, l. c. p. 292, from Sydney, &c. ; *B. castaneipes*, l. c. p. 293, from Melbourne : (BRACHYPEPLUS, pr.) *B. deyrollei*, l. c. p. 294, from Guinea ; *B. parallelus*, l. c. p. 495, from Natal ; *B. pilosellus*, l. c. p. 296, from Sierra Leone ; *B. anceps*, l. c. p. 297 (*B. diluticollis*, Motsch.), from Trinidad and South America ; *B. prolivus*, ibid., from Caraccas ; *B. tennis*, l. c. p. 298, from Brazil ; *B. orientalis*, ibid., from Borneo ; *B. patruelis*, l. c. p. 299, from India ; *B. omalinus*, ibid., pl. 34. fig. 7, from Ceylon ; *B. notatus*, l. c. p. 300, from Ceylon ; *B. wallacei*, ibid., from Mysol ; *B. latus*, l. c. p. 301, from Borneo ; *B. lowei*, ibid., pl. 34. fig. 6, from Borneo : (SELIS) *B. cuneatus*, l. c. p. 302, pl. 36. fig. 11, from Batchian ; *B. apicalis*, l. c. p. 303, from Mysol ; *B. caudalis*, l. c. p. 304, from Batchian : (LEIOPEPLUS) *B. lafertei*, l. c. p. 305, from the Senegal : (LIPAROEPLUS) *B. convexus*, l. c. p. 306, from Bahia ; *B. colastoides*, l. c. p. 307, from Old Calabar.

Cilleus. Murray describes : *Cilleus longipennis*, l. c. p. 314, and *C. vermis*, l. c. p. 315, from Madagascar.

Orthogramma (g. n.). Murray describes : *Orthogramma longiceps*, l. c. p. 319, pl. 36. fig. 3, *O. fissiceps*, l. c. p. 320, and *O. saundersii*, l. c. p. 323, from

Dorey; *O. puncticeps*, l. c. p. 320, and *O. fuscipennis*, l. c. p. 321, pl. 35. fig. 3, from Borneo; *O. denticeps*, l. c. p. 322, from Singapore; *O. planiceps*, l. c. p. 322, from Malacca; and *O. breviceps*, l. c. p. 323, from Nicobar.

Halepopeplus (g. n.) *bipustulatus*, Murray, l. c. p. 325, *H. erythropyga*, Murr. l. c. p. 326, and *H. batesii*, Murr. ibid., pl. 35. fig. 1, from the Amazons.

Conotelus. Murray describes: *Conotelus rufipes*, l. c. p. 336, and *C. mexicanus*, l. c. p. 337, from Mexico; *C. nitidus*, l. c. p. 337, from Brazil; and *C. stenoides*, l. c. p. 338, from Central America.

Carpophilus. Murray describes:—(UROPHORUS) *Carpophilus foveicollis*, l. c. p. 344, from Macassar, &c.; *C. adumbratus*, ibid., pl. 33. fig. 5, from North China; *C. nitidus*, l. c. p. 345, from Old Calabar; *C. rubiginosus*, l. c. p. 346, from Java: (CARPOPHILLUS) *C. rubescens*, l. c. p. 348, from Borneo; *C. cuneiformis*, ibid., from Celebes; *C. ferrugineus*, l. c. p. 349, and *C. ligneus*, l. c. p. 351, from Mexico; *C. compressus*, ibid., from Rio Janeiro; *C. planatus*, l. c. p. 353, from Victoria; *C. lacertosus*, l. c. p. 354, *C. purpureipennis*, ibid., from Venezuela; *C. rufitarsis*, ibid., from Guatemala; *C. lugubris*, l. c. p. 355, from North and South America; *C. triton*, l. c. p. 357, from Sunggari; *C. morio*, (Klug), l. c. p. 357, from Madagascar; *C. funereus*, l. c. p. 358, from Ceylon; *C. tectus*, l. c. p. 359, from Borneo and Singapore; *C. flavipes*, ibid., from Celebes and Singapore; *C. variolosus*, l. c. p. 360, from Sarawak; *C. obesus*, l. c. p. 361, from Aru and Dorey; *C. puncticeps*, ibid., from Old Calabar; *C. hoffmanseggii*, l. c. p. 362, from Madagascar?; *C. ligatus* (Motsch.), l. c. p. 363, and *C. bifenestratus*, l. c. p. 364, from Ceylon; *C. binotatus*, l. c. p. 366, from Sierra Leone; *C. bakerwellii*, ibid., from Victoria; *C. dolens*, l. c. p. 367, from the Senegal?; *C. chalybeus*, l. c. p. 369, from Sunggari and Dauria; *C. cribratus*, ibid., of unknown origin; *C. fusus*, l. c. p. 370, from Dorey; *C. rufus*, l. c. p. 371, from Mexico; *C. maculatus*, l. c. p. 372, from Oahu; *C. vittiger*, l. c. p. 373 (= *biguttatus*, Motsch. ?), from India, &c.; *C. oculatus*, l. c. p. 374, from Borabora; *C. australis*, l. c. p. 376, from Australia; *C. angustatus*, l. c. p. 376, from Madagascar; *C. ochropterus* (Klug), l. c. p. 377 (= *lividus*, Dej.), from Madagascar and Caffraria; *C. luridus* (Dej.), l. c. p. 377, nearly cosmopolite; *C. pallescens*, l. c. p. 380, from Waigiou; *C. notatus* (Klug), ibid., and *C. truncatus* (Klug); l. c. p. 381, from Madagascar; *C. nepos*, ibid., from Brazil; *C. schiödtei*, ibid., from Pulo Milu; *C. cylindricus*, l. c. p. 382, from Ceylon; *C. tenuis*, ibid., from China: (NITORS) *C. ophthalmicus* (Laf.), l. c. p. 383, pl. 33. fig. 8, from Mexico and Trinidad; *C. pubescens*, ibid., from Ceylon: (ENDOMERUS) *C. piger*, l. c. p. 384, pl. 33. fig. 3, from Guatemala; *C. senex*, ibid., from Mexico: (ECNOMORPHUS, Motsch.) *C. xanthopterus*, l. c. p. 389, of unknown origin: (MICROXANTHUS) *C. ustulatus*, l. c. p. 391, from New Guinea; *C. gentilis*, l. c. p. 392, and *C. frivolus*, ibid., from Victoria; *C. inconspicuous*, l. c. p. 393, from Batchian.

Haptoncus (g. n.) *tetragonus* (Dohrn), Murray, l. c. p. 401, pl. 33. fig. 7, and *H. pubescens*, Murr. l. c. p. 403, from Ceylon; *H. concolor*, Murr. l. c. p. 402, from Dorey; *H. ovalis*, Murr. l. c. p. 403, from New Guinea; *H. testaceus*, Murr. ibid., from Macassar.

Mystrops discoideus, Murray, l. c. p. 412, pl. 32. fig. 5 (= *M. flexuosus* and *angulipennis*, Motsch.), from the Amazons; *M. flavicans* (Dej.), Murr. l. c. p. 413, pl. 32. fig. 3, from Brazil; *M. adustus* (Motsch.), Murr. l. c. p. 414, from Columbia.

Meliethes virescens, Woll. l. c. p. 113, from the Canaries.

Rhizophagus pinetorum, Woll. l. c. p. 118, and *R. subopacus*, Woll. l. c. p. 119, from the Canaries; *R. cubensis*, Chevr. l. c. p. 604, from Cuba.

Cybocephalus ceneus, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 237, from Algeria; *C. laevis*, Woll. l. c. p. 117, from Lanzarote.

TROGOSITIDÆ.

Syntelia, sp. n., Westw. Proc. Ent. Soc. Lond. 1864, p. 11. • Allied to *Platycerus*; oblong, depressed; head subquadrate; mandibles large, irregularly toothed; palpi subfiliform, joints equal; labium deeply incised; antennæ short, 11-jointed, subgeniculate, received in oblique pits, club large, flat, ovate, triarticulate, nearly solid; tarsi 5-jointed. Sp. *Syntelia indica*, Westw. l. c. p. 11, from India; *S. mexicana*, Westw. ibid., from Mexico.

COLYDIIDÆ.

Endophlæus spinulosus (Lat.) is figured by Rye, Ent. Ann. 1864, fig. 7.

Esarcus, g. n., Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 238. Nearly allied to *Tarphius*; antennæ inserted in front of eyes, 11-jointed, nearly filiform, gradually thickened to the apex, not clubbed; abdomen of five segments; legs inserted close together; tarsi 4-jointed, first joint as long as the two following together. Sp. *Esarcus leprieurii*, Reiche, l. c. p. 239, from Algeria.

Coxelus sylvaticus, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 405, from Chili.

Aulonium sulcicolle, sp. n., Woll. Cat. Can. Coll. p. 127, from the Canaries.

Bothrideres rectangularis, sp. n., MacLeay, Trans. Ent. Soc. N. S. W. i. p. 119, from Port Denison.

Plagiopæ tuberculata, sp. n., Chevr. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 607, from Cuba.

Eulachus semifuliginosus, sp. n., Chevr. l. c. p. 608, and *E. quinquecarinatus*, Chevr. l. c. p. 609, from Cuba.

Bothrideres dentatus, sp. n., Chevr. l. c. p. 609, and *B. planus*, Chevr. l. c. p. 610, from Cuba.

Cerylon amaroides, sp. n., Chevr. l. c. p. 610, and *C. exartus* (Erichs. MS.), Chevr. ibid., from Cuba.

Discoloma parvula, sp. n. (Erichs. MS.), Chevr. l. c. p. 610, from Cuba.

CUCUJIDÆ.

Silvanus fagi (Guér.) is identical with *S. similis* (Erichs.), according to Kraatz, Berl. ent. Zeits. 1864, p. 133.

Hæctarthrum nodicorne, sp. n., Vollenhoven, Tijdschr. voor Entom. vii. p. 145, pl. 9. fig. 1, from Borneo.

Silvanus siculus, sp. n., Stierlin, Berl. ent. Zeits. 1864, p. 147, from Sicily.

Pediacus tabellatus, sp. n., Woll. Cat. Can. Col. p. 131, from Teneriffe.

Læmophlæus bicolor, sp. n., Chevr. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 612, from Cuba.

Platanus? *pallidulus*, sp. n., Chevr. l. c. p. 602, from Porto Rico.

Pristoscelis atrus (sic), sp. n., Bland, Proc. Ent. Soc. Phil. vol. iii. p. 253,

from California; *P. fulvo-tarsis*, sp. n., Bland, l. c. p. 254, from California; *P. nigricornis*, sp. n., Bland, ibid., from Kansas.

CRYPTOPHAGIDÆ.

Wollaston (Ent. M. Mag. vol. i. pp. 14-19) discusses the structural characters of *Latridius*, and the systematic relations of that genus. He considers that the *Latridiide* form a small family intermediate between the *Cryptophagidæ* and *Mycetophagidæ*.

New species:—

Cryptophagus obesulus, Woll. Cat. Can. Col. p. 126, from the Canaries.

Atomaria. Wollaston describes three new Canarian species of this genus: *Atomaria pilosula*, l. c. p. 142; *A. canariensis*, ibid.; *A. ruficollis*, l. c. p. 143.

Mnionomus, subg. nov.?, Woll. Cat. Can. Col. p. 138: allied to *Cryptophagus*. *M. ellipticus*, Woll. l. c. p. 138, from Teneriffe.

Corticaria angulata, Woll. Cat. Can. Col. p. 148, and *C. tenella*, Woll. l. c. p. 150, from the Canaries.

Latridius opacipennis, Woll. l. c. p. 157, from Teneriffe.

Myrmecoxenus sordidus, Woll. Cat. Can. Col. p. 152, from Fuerteventura.

Mycetophagus chilensis, Philippi, Stett. ent. Zeit. 1864, p. 376, from Chili.

Litargus trifasciatus, Woll. l. c. p. 154, from Gomera.

Typhæa semirufa, Chevr. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 614, from Cuba.

Diplocælus costulatus, Chevr. l. c. p. 615, from Cuba.

Thorictus vestitus, Woll. l. c. p. 186, from Lanzarote.

DERMESTIDÆ.

Kraatz remarks that *Anthrenus gravidus* (Küster) is only a variety of *A. scrophulariæ*; and that if *A. gravidus* be, as seems probable, a transition-step between *A. scrophulariæ* and *A. proteus* (Kr.), the variety of the latter named *seneæ* by him would be only a white-scaled variety of *A. scrophulariæ*. Berl. ent. Zeits. 1864, pp. 133, 134.

Dermestes marmoratus, sp. n., Chevr. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 616, from Cuba and the United States.

Trogoderma insulare, sp. n., Chevr. l. c. p. 617, and *T. subfasciatum*, sp. n., Chevr. ibid., from Cuba.

Attagenus seminiger, sp. n., Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 639, from Algeria.

Telopes anthrenoides, sp. n., Woll. Cat. Can. Col. p. 159, from Grand Canary.

BYRRHIDÆ.

Cytilus pulchellus (Heer) is a variety of *Cytilus varius*, as stated by Von Heyden. Kraatz, Berl. ent. Zeitschr. 1864, p. 133.

Nosodendron punctato-striatum, sp. n., Chevr. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 618, from Guadaloupe.

Syncalyptra integra, sp. n., Woll. Cat. Can. Col. p. 161, from Hierro.

Morychus variolosus, sp. n., Perris, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 281, from the Escorial, under stones.

Limnichus leprieurii, sp. n., Perris, l. c. p. 282, from Algeria.

PARNIDÆ.

Perez (Ann. Soc. Ent. Fr. 4^e sér. tome iii. pp. 621-636) describes and figures the metamorphoses of *Macronychus quadrituberculatus*, the larvæ of which he met with in August 1862, in cavities in the bark of an old rotten willow trunk partially immersed in the water. The larvæ were at a height of two feet above the surface of the water, and the author found that they had ascended to this elevation for the purpose of undergoing their change to the pupa state, which takes place in small cavities hollowed out in the substance of the decaying bark. The author fully describes the structure of both the larva and pupa, and figures them, with details, on the plate accompanying his memoir (pl. 14). He also describes a species of *Pteromalus* which is parasitic on the *Macronychus*.

Kraatz regards *Heterocerus minutus* (Kiesenw.) as identical with *H. flavidus* (Rossi). Berl. ent. Zeitschr. 1864, p. 133.

Heterocerus flavescens, sp. n., Schaufuss, Sitzungsber. Gesellsch. Isis, for 1863, p. 116, and *Het. funebris*, sp. n., Schaufuss, l. c. p. 117, from the South of Spain.

Elmis condimentarius, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 96, from Peru. (See ante, p. 347).

LUCANIDÆ.

In his valuable Catalogue of the Lucanoid Coleoptera (Ent. Trans. 3rd series, vol. ii. pp. 1-113), Parry divides these Beetles into seven families, namely *Chiasognathidæ*, *Lucanidæ*, *Dorcidæ*, *Figulidæ*, *Syndesidæ*, *Æsalidæ*, and *Sinodendridæ*. The total number of species admitted by the author into his list is 332, of which 145 belong to the second and 110 to the third of his families. The new species, of which the names are given below, amount to fifty.

Parry has published (Proc. Ent. Soc. Lond. 1864, pp. 5-8) some further remarks on Thomson's "Catalogue of Lucanidæ," containing an indication of the synonymy of fifteen of Thomson's species, with special notes on that of *Dorcus luxerii* (Buquet), *Ægus cicatricosus* (Dejean), *Prosopocoilus bulbosus* (Hope), and *Ceratognathus helotoides* (Thomson). All these synonymies are reproduced in his "Catalogue of the Lucanoid Coleoptera."

Parry remarks (Ent. Trans. vol. ii. p. 6) that *Chiasognathus latreillei* (Solier) and *C. reichii* (Thoms.) are the sexes of the same species, and that *C. miszechii* (Thoms.) is probably identical with *C. jousselinii* (Reiche).

The same author removes the genus *Colophon* (Westw.) from the *Dorcidæ* to the *Chiasognathidæ*, considering it to be most nearly allied to *Lamprina* (l. c. p. 7).

According to Parry (l. c. p. 10), *Lucanus sericans* (Voll.) is probably a variety of *L. maculifemoratus* (Motsch.), and from Japan, not Java.

The genera *Odontolabis* and *Anoplocnemus* of Hope are regarded by Parry as forming only a single genus (*l. c. p. 12*), for which he retains the former name; but the second section of Hope's genus *Odontolabis* has been generically separated by Thomson under the name of *Neolucanus*, and this division is accepted by Parry (*l. c. p. 20*).

Parry also (*l. c. p. 21*) unites Hope's genera *Macrogathus*, *Metopodontus*, and *Prosopocoilus* with the great genus *Cladognathus* (Burm.), which, however, he regards as only provisional. *Cladognathus lafertei* (Reiche) is from the New Hebrides and not from Australia (*l. c. p. 24*). Parry (*l. c. p. 34*) regards *Clad. (Luc.) senegalensis* (Klug) as distinct from *Lucanus antilopus* (Swed.) with which Burmeister united it, and indicates that the *C. antilopus* of Burmeister, if really a more fully developed specimen of *L. antilopus* (Swed.), is probably also identical with *L. quadridens* (Hope).

According to Parry (*l. c. p. 39*), his *Cyclommatus æneomicans* is identical with *Lucanus metallifer* (Boisd.).

Parry also states that *Dorcus klugii* (Thoms.) is the large variety of *D. dehaanii*, Hope (*l. c. p. 50*),—and that *Dorcus ? luteus* (Westw.) is probably the same as *Ægus cicatricosus* (Wiedem.), which is the female of *D. acuminatus* (Fab.), as stated by Burmeister (*l. c. pp. 51 & 52*).

Cladognathus dorsalis (Erichs.). The male is described by Parry, *l. c. p. 31*. The male of *C. curvipes* (Hope) is also described, *l. c. p. 35*.

Parry states that *Ceratognathus punctatissimus* (Westw.) is identical with *C. westwoodii* (Thomson), and *Sinodendron ? areolatum* (Westw.) with *Ceratognathus helotoides* (Thomson). *Proc. Ent. Soc. Lond. 1864*, pp. 6 & 8.

Parry (*Ent. Trans. vol. ii. p. 9*) describes a specimen of *Lucanus cervus* in the Berlin Museum having the right mandible and fore tibia as in the female, and the rest of the insect presenting the ordinary appearance of the male.

Stierlin describes a Sicilian variety of *Dorcus parallelopipedus*, which forms a transition towards *D. musimon*. *Berl. ent. Zeitschr. 1864*, p. 147.

The following known species are figured by Parry (*l. c. pls. 1-11*):—

Chiasognathus mniszecii ♂ (Thomson), pl. 10. fig. 3.

Mesotopus tarandus ♀ (Swed.), pl. 5. fig. 4; *Rhætus (Hexarthrius) westwoodii* ♂ (Parry), pl. 9. figs. 2 & 8; *Odontolabis ludekingii* (Voll.), pl. 2. fig. 1; *O. brookeanus* ♂ (Voll.), pl. 6. fig. 5; *Cladognathus lafertei* ♀ (Reiche), pl. 8. fig. 5; *C. tragulus* (Voll.), pl. 7. fig. 6; *C. zebra* ♀ (Oliv.), pl. 4. fig. 5; *Homodorus mellyi* (Parry), pl. 11. fig. 6; *Cyclorasis subnitens* (Parry), pl. 7. fig. 1; *Cantharolethrus luzerii* (Buquet), pl. 9. fig. 6; *Leptinopterus (Psali-dostomus) fryi* (Parry), pl. 7. fig. 4; *Lept. (Ibal.) rotundatus* (Parry), pl. 7. fig. 2; *Macrocrates bucephalus* (Burm.), pl. 10. fig. 9; *Hemisodorcus passaloides* (Hope), pl. 10. fig. 4.

Deyrolle describes *Sclerostomus fasciatus* (Germain), *Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 318*.

New genera :—

(*Lucanides*).

Rhætus, Parry, *l. c. p. 10*. Allied to *Hexarthrius*. Head narrow, depressed

in front; antennæ with a moderate four-jointed club; prothorax armed at the sides; posterior tibiæ unarmed. Sp. *R. westcoodii* (Parry), from the East Indies.

Heterochthes (Westwood), Parry, *l. c.* p. 17. Allied to *Odontolabis*. Head with the anterior margin nearly straight, its sides scarcely tuberculate (not spined) behind the eyes; sides of prothorax unarmed, rounded; anterior tibiæ quadridentate, intermediate and posterior unarmed. Sp. *Heterochthes brachypterus* (Westw.), Parry, p. 18, pl. 10. figs. 6 & 7, and pl. 11. figs. 1, 2 & 3, from Cambodia.

Homoderus, Parry, *l. c.* p. 38. Allied to *Cladognathus*. Head broad, armed behind the eyes, clypeus wide, produced, and emarginate; sides of prothorax sinuated; legs slender, anterior tibiæ not dilated in ♀, posterior tibiæ unarmed in ♂. Sp. *H. mellyi* (Parry, Proc. Ent. Soc., 1862).

(*Dorcides*).

Ditomoderus, Parry, *l. c.* p. 45. Allied to *Eurytrachelus*. Club of antennæ four-jointed; prothorax with its sides rotundato-dilated and deeply furrowed longitudinally; anterior tibiæ multidentate. Sp. *D. mirabilis*, Parry, pl. 12. fig. 6, from Borneo.

New species :—

Streptocerus eustictus, Philippi, Stett. ent. Zeit. p. 316, from Chili.

Parry has described (Ent. Trans. 3rd ser. vol. ii.) the following new species of *Lucanus*: *Lucanus hopei* ♂, p. 9, pl. 4. fig. 2, from East Indies; *L. smithii* ♂, p. 10, pl. 10. fig. 2, from N. India.

Lucanus laticornis, Deyrolle, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 312, from Mount Ararat.

Hexarthrius chaudiroidi, Deyrolle, *l. c.* p. 312, pl. 4. fig. 1 (Parry, *l. c.* p. 11), from Sumatra.—*H. deyrollei* ♂, Parry, *l. c.* p. 11, pl. 4. fig. 1, from Siam; *H. bowringii* ♂, Parry, *l. c.* p. 12, pl. 9. figs. 5 & 7.

Parry describes (*l. c.*) the following new species of *Odontolabis*: *Odontolabis vollenhovi* ♂, p. 13, pl. 8. fig. 1, from Borneo; *O. wollastonii*, p. 14, pl. 3. fig. 1, from Malacca; *O. mouhotii*, *ibid.*, pl. 1. fig. 1, from Siam; *O. castelnaudi* ♂, *ibid.*, pl. 1. fig. 2, from Sumatra; *O. sommeri* ♂, p. 16, pl. 6. fig. 4, from Manilla; *O. cingalensis* ♂, *ibid.*, pl. 10. fig. 8, from Ceylon.

Odontolabis striatus, Deyrolle, *l. c.* p. 313, pl. 4. fig. 3 (Parry, *l. c.* p. 15), from Malacca; *O. nigrinus*, Deyr. *l. c.* p. 314 (Parry, *l. c.* p. 17), from Ceylon; and *O. intermedius*, Deyr. *ibid.*, from Ceylon.

Neolucanus saundersii ♂, Parry, *l. c.* p. 20, pl. 9. fig. 3, from East Indies; *N. cingulatus* ♀, Parry, *ibid.*, pl. 4. fig. 3, and *N. championi* ♂, Parry, *ibid.*, from China.

Cladognathus politus ♂, Parry, *l. c.* p. 21, pl. 10. fig. 5; and *C. quadrimodorus* ♂, p. 22, pl. 8. fig. 4, from the East Indies; *C. wallacei* ♂, p. 23, pl. 7. fig. 2, from Gilolo; *C. assimilis* ♀ (= *productus* ♀, Parry, Proc. Ent. Soc. 1862), p. 25, from Waigiu; *C. perplexus* ♂, p. 26, from East Indies; *C. attenuatus* ♂, p. 26, pl. 4. fig. 2, from Malacca; *C. squamulatus*, ♂, *ibid.*, from Borneo and Malacca; *C. elegans* ♂, p. 27, pl. 8. fig. 3, from East Indies; *C. flavidus* ♂, *ibid.*, pl. 8. fig. 2, from East Indies; *C. fulvonotatus* ♂, p. 28, pl. 6. fig. 3, from East Indies; *C. bisignatus*, *ibid.*, pl. 7. figs. 3 & 5, from East Indies;

C. modestus ♂, p. 29, pl. 12. fig. 1, from West Africa; *C. decipiens* ♀, p. 31, pl. 4. fig. 4, from Malabar; *C. approximatus* ♂, p. 33, from Cochin China; *C. eximius*, ibid., from West Africa; *C. rudis* ♀, (Westw. MS.), p. 35, pl. 11. fig. 4, from East Indies; and *C. natalensis* ♂, p. 36, from Natal.

Cladognathus decipiens, Deyrolle, l. c. p. 315, from Malabar. (Parry.)

Homoderus mellyi (Parry), figured by Deyrolle, pl. 4. fig. 2.

Cyclommatus affinis ♂, Parry, l. c. p. 40, from Borneo and the Philippines.

Cyclorasis jekelii ♂, Parry, l. c. p. 41, pl. 9. fig. 4, from Chowsan.

(*Dorcides*).

Eurytrachelus thomsoni ♂, Parry, l. c. p. 47, from the Moluccas.

Dorcus derelictus ♀, Parry, l. c. p. 50, from the Himalayas.

Gnaphaloryx dilaticollis ♂, Parry, l. c. p. 51, from the Eastern Archipelago?;
G. sculptipennis ♂, Parry, l. c. p. 52, from New Guinea.

Ægus labilis (Westw.), Parry, l. c. p. 54, pl. 11. fig. 5, from Darjeeling;
Æ. platyodon ♂, p. 56, pl. 10. fig. 1, from Gilolo; *Æ. blandus* ♂, p. 57, from New Guinea; *Æ. punctipennis* ♂, p. 58, from Borneo; *Æ. serratus* ♂, ibid., pl. 5. fig. 1, from Morty; *Æ. impressicollis*, ibid., pl. 5. fig. 3, from Malacca and Borneo; *Æ. glaber* ♂, p. 59, from New Guinea; and *Æ. ? trilobatus* ♂, ibid., pl. 7. fig. 7, from Borneo.

† *Platycerus caucasicus* ♂, Parry, l. c. p. 60, from the Caucasus.—*P. ebeninus*, Deyrolle, l. c. p. 317, pl. 4. fig. 4, from Brazil.

Sclerostomus signatipennis, Deyrolle, l. c. p. 319, from Brazil; *S. lineatus*, Deyrolle, ibid., from Peru; *S. fairmairii*, Parry, l. c. p. 61, from Chili; *S. philippii* (Westw.), Parry, l. c. p. 61, pl. 11. fig. 5, from Chili.

(*Figulides*).

Nigidius obesus ♂, Parry, l. c. p. 63, from Malacca and Penang.

Coprides.

SCARABÆIDÆ.

Heyden states that *Sisypus albiventris* (Dahl) occurs with the sides of the body white, only in human ordure in those places where the population lives on maize or millet. Berl. ent. Zeits. 1864, p. 318. According to Heyden (ibid.) *Sisypus tauscheri* (Fisch.) is only a southern variety of *S. schaefferi*. The same author states, l. c. p. 319, that *Onitis pugil* (Costa) = *O. furcifer* ♂; and *O. furcifer* (Rossi, Costa) = *hungaricus* (Herbst) = *melybaeus* (Muls.); *Onthophagus truckmenus* (Kol.) = *marmoratus* (Fald.); *O. maurus* (Luc.) = *marginalis* (Gehl.) = *andalusicus* (Waltl).

Lucas describes the pupa-cell of a species of *Copris* from Siam. This cell is nearly spherical, about 28 millims. in diameter, and 5 millims. in thickness. It is composed of excrementitious matter mixed with earth, very hard, and smooth and polished within. Bull. Soc. Ent. Fr. 1864, p. xxxi.

New species:—

MacLeay has described (Trans. Ent. Soc. N. S. W. i. p. 119 *et seq.*) the following species of *Onthophagus* from Port Denison: *O. laminatus*, MacLeay (p. 119); *O. tabellicornis*, MacLeay (p. 120); *O. furcatus*, *O. conspicuus* (p.

121); *O. rufosignatus*, *O. rubrimaculatus* (p. 122); *O. purpureicollis*, *O. cuniculus* (p. 123); *O. muticus*, *O. granulatus* (p. 124); and *O. asper* (p. 125).

Onthophagus nebulosus (Oliv. MS.), Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 239, from Algeria; *O. schwaneri*, Vollenhoven, Tijdschr. voor Ent. vii. p. 146, pl. 9. fig. 2, from Borneo.

Aphodiides.

According to Heyden, Berl. ent. Zeits. p. 319, *Aphodius suturalis* (Fald.) = *granarius*, var., and approaches *A. trucidatus* (Harold); and *A. rhenonum* (Zett.) = *lapponum* (Harold).

Aphodius siculus (Harold) is not distinct from *A. carpetanus*, according to Kraatz, Berl. ent. Zeits. 1864, p. 133.

D. Sharp and Rye remark upon the occurrence of *Aphodius obliterated* (Panz.) in Britain, and indicate the characters by which it is distinguished from *A. contaminatus*. Ent. M. Mag. vol. i. p. 169.

Psammodius porcicollis (Ill.). Waterhouse (Proc. Ent. Soc. Lond. 1864, p. 3) mentions the occurrence of a specimen of this species in Kirby's British Collection with *P. sulcicollis*, and indicates the characters by which the species may be distinguished.

Aphodius tenuatus, sp. n., Woll. Cat. Can. Coll. p. 189, and *A. maculosus*, Woll. ibid., from Lanzarote and Fuerteventura; *A. angustus*, Philippi, Stett. ent. Zeit. 1864, p. 316, from Chili.

Psammodius costatus, sp. n., Stierlin, Bull. Soc. Nat. Mosc. 1863, p. 489, from Sarepta—nearly allied to *P. porcicollis*.

Orphnides.

Hybalus benoitii, sp. n., Tournier, Mitth. Schw. ent. Ges. 1864, p. 266, from Messina.

Hybosorides.

Silphodes hirtipes, sp. n., MacLeay, Trans. Ent. Soc. N. S. W. vol. i. p. 125, from Port Denison: "found under a dead Kangaroo."

Cœlodes bimaculatus, sp. n., MacLeay, l. c. p. 126, from Port Denison.

Geotrupides.

Bolboceras gallicus is included in the list of Tuberivorous insects by Laboulbène; Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 93.

Bolboceras rhinoceros, sp. n., MacLeay, l. c. p. 126, and *B. globuliformis*, MacLeay, l. c. p. 127, from Port Denison.

Trogides.

Trox confluentis, sp. n., Woll. l. c. p. 193, from Teneriffe; *T. subcarinatus*, sp. n., MacLeay, l. c. p. 128, from Port Denison.

MacLeay describes the following new species (Trans. Ent. Soc. N. S. W. i.): *Liparetrus rufipennis*, *L. atriceps* (p. 128), *L. discoidalis*, *L. rubicundus*, *L. concolor* (p. 129), and *L. basalis* (p. 130), from Port Denison.

Glaphyrides.

Cratoscelis canicapilla, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 326, from Chili.

Melolonthides.

Kraatz has published (Berl. ent. Zeitschr. 1864, pp. 1-16) an elaborate discussion of the specific identity and distinctness of the supposed European species of the genus *Melolontha*. He reduces the number of distinct species to three, of which the remainder are regarded as varieties, as shown in the following Table:—

1. *Melolontha vulgaris* (Fabr.) with var. *albida* (Redt.), from Germany; var. *albida* (Muls.), from Germany and France; var. *albida* (Castlenau), from Greece; *candicans* (Burns.), from Greece and Syria; and var. *extorris* (Erichs.), from S. Russia.

2. *Melolontha pectoralis* (Germ.) with *aceris* (Erichs.), from Austria; var. *rhenana* (Bach), from Rhenish Prussia and Turkey; and *albida* (Erichs.).

3. *Melolontha hippocastani* (Fab.), from Europe.

Heyden states, Berl. ent. Zeits. p. 319, that *Hoplia canescens* (Motsch.) = *H. pilicollis* (Erichs.); *Polyphylla caucasica* (Kol.) = *P. fullo*, var. *boryi* (Prullé), l. c. p. 320; *Homalopia pinnosa* and *alternata* (Küst.) are var. of *H. ruricola*. *Anomala lunata* (Fald.) = *arcuata* (Geb.), according to Heyden, l. c. p. 321.

W. MacLeay (Trans. Ent. Soc. N. S. W. pp. 75-86) discusses the relations of *Phyllotocus*, which he considers to belong to the *Glaphyridæ*, and gives a detailed description of the characters of that genus, and characters of the known species.

Stierlin (Bull. Soc. Nat. Mosc. 1863, p. 490) describes a peculiar variety of *Hoplia pulverosa*, Küster, from Sarepta.

Jäckel records the occurrence at Altmühl, in 1864, of *Anisoplia horticola* in such numbers as to become injurious to agriculture, and especially to orchards. Many apple and cherry trees were completely stripped of their leaves, and the young fruit of the former was also eaten. The insect also attacked the hops, to which it did much damage. Corr.-Blatt. zool.-mineral. Ver. Regensb. pp. 79 & 80.

New genera and species:—

Cheiragra, MacLeay, Trans. Ent. Soc. N. S. W. i. p. 86. Allied to *Phyllotocus*, but with the clypeus rounded in front and without a suture, the antennæ eight-jointed, the posterior femora thick, and the anterior tarsi and claws enlarged in the male. Sp. *Cheiragra ruficollis*, *pallida*, *lurida*, MacLeay, l. c. p. 87, *aphodioides*, *atra*, and *pygmæa*, MacLeay, l. c. p. 88, all from New South Wales.

Macrothops, MacLeay, l. c. p. 89. Distinguished from *Phyllotocus* by its very long, filiform maxillary palpi, and by its clypeus being very long and rostriform, carinated and somewhat reflexed at the apex. Sp. *Macrothops rostrata*, MacLeay, l. c. p. 89, from King George's Sound; *Macrothops pallidipennis*, MacLeay, l. c. p. 90, from Victoria River.

W. MacLeay describes (Trans. Ent. Soc. N. S. W. i.) *Phyllotocus kingii*, *marginipennis*, *iridescent* (p. 83), *palliat*, *marginatus*, *ruficollis* (p. 84), and *scutellaris* (p. 85), all from New South Wales, and *Phyllotocus apicalis* (p. 85) from Port Denison.

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Ootoma integra, Woll. l. c. p. 197, and *O. obscurella*, Woll. l. c. p. 200, from the Canaries.

Diaphylla luctuosa, Philippi, Stett. ent. Zeit. 1864, p. 323, from Chili.

Maypa opaca, Philippi, l. c. p. 324, and *M. cuprea*, Phil. ibid., from Chili.

Listronyx obscura, Philippi, l. c. p. 325, from Chili.

Sericoides nitida, Philippi, l. c. p. 324, from Chili.

Rhizotrogus lautiusculus, Schaufuss, Verh. zool.-bot. Ges. in Wien, Bd. xiv, p. 675, from Dalmatia; *R. (Amphimallus) javeti*, Stierlin, Berl. ent. Zeitschr. 1864, p. 147, from Sicily; *R. (Amphimallus) obscurus*, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 240, from Algeria.

Rhizotrogus lateritius, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 640, and *R. nitidicollis*, Fairm. ibid., from Algeria.

Anaxia sicula, Kraatz, Berl. ent. Zeitschr. 1864, p. 3, note, from Sicily.

Rutelides.

Philippi remarks (Stett. ent. Zeit. 1864, p. 321) that Blanchard's figure and description of *Tribostethus ciliatus* in Gay's 'Chili' do not agree either in respect to form or colour. The figure seems to represent *T. castaneus* (Curt.). Philippi possesses a species which agrees well with the description of *T. ciliatus* (Sol.), but has one of the claws on all the feet cleft—a character which does not occur in either *Tribostethus* or *Aulacopalpus*. This has probably been overlooked by Blanchard.

New species :—

Anomala (Euchlora) pedemontana, Tournier, Mitth. Schw. ent. Ges. 1864, p. 267, from Piedmont.

Phyllopertha algerica, Reiche, l. c. p. 241, from Algeria.

Parastasia pileus, Vollenh. Tijdschr. voor Ent. vii. p. 147, pl. 9. fig. 3, from Borneo, &c.; *P. degenerata*, Voll. l. c. p. 147, from Borneo, &c.; *P. ephippium*, Voll. l. c. p. 148, pl. 9. fig. 4, from Sumatra; *P. vittata*, Voll. l. c. p. 149, from Amboina and Buru; *P. atra*, Voll. ibid., from Amboina.

Anoplognathus lineatus, MacLeay, Proc. Ent. Soc. N. S. W. 1863, p. xviii; *A. nebulosus*, MacLeay, l. c. p. xix; *Calloodes rayneri*, MacLeay, ibid., from Port Denison.

Brachysternus. Of this genus the following new Chilean species are described by Philippi, Stett. ent. Zeit. 1864: *Brachysternus major*, l. c. p. 317; *B. obscurus*, ibid.; *B. olivaceus*, l. c. p. 318; *B. ? chloris*, l. c. p. 319.

Tribostethus ?? *virens*, Philippi, l. c. p. 320, and *T. cupreus*, Phil. l. c. p. 321, from Chili.

Aulacopalpus pangustus, Philippi, l. c. p. 322, from Chili.

Liogenys grandis, Philippi, l. c. p. 322, from Chili.

Dynastides.

Oryctes prolixus, sp. n., Woll. l. c. p. 202, from the Canaries.

Trichogomphus simson, sp. n., Voll. Tijdschr. voor Ent. vii. p. 150, from Sumatra; *T. alcides*, sp. n., Voll. l. c. p. 151, pl. 9. fig. 5, from Borneo.

Cetoniides.

Vollenhoven (Tijdschrift voor Entom. vii. pl. 10. fig. 3) figures a remarkable variety of *Schizorhina flammula* (Hombr. et Jacq.).

New genera and species :—

Proberhinus, g. n., H. Deyrolle, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 321. Allied to *Cyclidius*. Head vertical; clypeus forming a broad, horizontal, keeled projection; vertex and forehead covered by a sort of hood, extending to the anterior margin of the eyes; prothorax very large, widest in front, with a transverse cariniform tubercle close to the middle of the anterior margin. Sp. *Proberhinus mouffleti*, Deyrolle, l. c. p. 321, pl. 4. fig. 5, from Fernando Po.

Heterorhina infuscatata, Vollenh. l. c. p. 151, from Guinea.

Clinteria egeus, Voll. l. c. p. 152, from Borneo; *C. vidua*, Voll. l. c. p. 152, pl. 9. fig. 6, from Sumatra; *C. dives*, Voll. l. c. p. 153, from Borneo.

Macronota aciculata, Voll. l. c. p. 153, from Java; *M. ludekingii*, Voll. l. c. p. 154, pl. 10. fig. 1, from Sumatra.

Schizorhina sanguinolenta, Voll. l. c. p. 155, pl. 10. fig. 2, from Celebes; *S. nigerrima*, Voll. l. c. p. 156, from Morotai.

Euryomia forsteni, Voll. l. c. p. 156, pl. 10. fig. 4, and *E. regalis*, Voll. l. c. p. 157, from Celebes; *E. sumatrensis*, Voll. l. c. p. 157, pl. 10. fig. 5, from Sumatra; *E. quadriguttata*, Voll. l. c. p. 158, from Sumatra, &c.; *E. sieboldii*, Voll. ibid., from Japan.

Oxythyrea niveopicta, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 639, from Algeria.

Macroma flavoguttata, Voll. l. c. p. 159, pl. 10. fig. 6, from Borneo.

Trichius 17-guttatus, Voll. l. c. p. 159, from Japan.

BUPRESTIDÆ.

Frauenfeld describes the larva of *Trachys pumila* (Ill.), which is found in spring mining the leaves of *Stachys recta* (Lin.). The pupa is met with at the beginning of July. Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 685.

New genera :—

Anambus, C. G. Thomson, Skand. Col. vi. p. 38. Allied to *Agrius*; posterior coxæ widely distant; claws bifid at apex. Sp. *A. biguttatus* (Fab.).

Habroloma, C. G. Thomson, l. c. p. 42. Allied to *Trachys*; prosternum with a large labial process concealing the mouth; posterior coxæ lobately produced within at their posterior margin. Sp. *H. nana* (Fab.).

New species :—

Catoxantha hemixantha, Vollenh. Tijdschr. voor Entom. vii. p. 160, pl. 11. figs. 1 & 2, from Banca.

Chrysochroa ludekingii, Voll. l. c. p. 161, pl. 11. fig. 3, from Sumatra.

Chalcophora pyrothorax, Voll. l. c. p. 162, from Borneo; *C. pyrosticka*, Voll. l. c. p. 162, pl. 11. fig. 4, from Sumatra; *C. amabilis*, Voll. l. c. p. 163, pl. 11. fig. 5, from Japan.

Psiloptera corinthia, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 264,
2 c 2

P. cupreofossa, Fairm. l. c. p. 265, *P. germainii*, Fairm. l. c. p. 266, and *P. denticollis*, Fairm. l. c. p. 267, from Mendoza.

Epistomentis vittatus, Philippi, Stett. ent. Zeit. 1864, p. 284, from Chili.

Anthraxia senilis, Woll. l. c. p. 208, from Grand Canary.

Zemina stenoloma, Philippi, l. c. p. 315, from Chili.

Stigmodera cribellata, Fairmaire, l. c. p. 263, and *S. tricolor*, Fairm. l. c. p. 264, from Mendoza; *S. laticollis*, Philippi, l. c. p. 313, and *S. chrysoclistra*, Phil. l. c. p. 314, from Chili.

Acmæodera. Wollaston describes three new Canarian species of this genus: *Acmæodera fracta*, Cat. Can. Col. p. 205; *A. plagiata*, l. c. p. 206; and *A. ornata*, l. c. p. 207.

Chrysobothrys cupreipes, Fairmaire, l. c. p. 262, from Mendoza; *Chrysobothrys pulcherrima*, Voll. l. c. p. 164, from Sumatra and Banca; *C. purpurata*, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 166, from Nebraska.

Cylindromorphus pyrethri (Becker), Stierlin, Bull. Soc. Nat. Mosc. 1863, p. 491, from Sarepta, perhaps identical with *C. papowii* (Mannerh.) from East-Siberia; *C. carpetanus*, Perris, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 282, from Spain.

Mastogenius sulcicollis, Philippi, l. c. p. 315, from Chili.

Aphanisticus distinctus, Perris, l. c. p. 283, from Spain.

Trachys major, Perris, l. c. p. 284, from Spain.

Tyndaris attenuatus, Fairmaire, l. c. p. 261, from Mendoza.

EUCNEMIDÆ.

Microrhagus chevrolati, sp. n., Stierlin, Berl. ent. Zeitschr. 1864, p. 148, from Sicily.

ELATERIDÆ.

Stierlin has given (Mittheil. Schweiz. ent. Ges. pp. 214-218) a tabular revision of the European species of *Cardiophorus*, extracted from the 'Monographie des Elatérides' of Candèze. The table contains the characters of 47 species, including not only those inhabiting Europe proper, but also the species found in Northern Africa and Western Asia.

Limonius. Stierlin has given a table of the European species of this genus, of which he enumerates nine, in Mittheil. Schw. ent. Ges. Feb. 1864, p. 192.

Carus has communicated to the Academia Naturæ Curiosorum Leopoldina (p. 126) an abstract of the observations made in Paris (see Comptes Rendus, 19th Sept.) on the light of *Pyrophorus*, and has some observations on insect luminosity.

Stierlin describes a variety of *Diacanthus cæneus* from Sicily. Berl. ent. Zeitsch. 1864, p. 149.

Candèze, Mém. Soc. Roy. Belg. vol. xvii. "Elatérides nouveaux," p. 17, states that *Alaüs appendiculatus* (Herbst) is from Amboina, and not from America; it is identical with *Alaüs roelofsii* (Candèze, MS.).

Cardiophorus rotundicollis (Friv.) = *turgidus* (Erichs.), according to Heyden, Berl. ent. Zeits. 1864, p. 321.

Athous undulatus (De G.) is figured by Rye, Ent. Ann. 1865, fig. 7.

New genera:—

Alaolacon, Candèze, l. c. p. 13. Allied to *Aliteus*. Forehead convex; mandibles emarginate; third joint of palpi ovate; antennæ short, second joint minute, third very large, triangular, remainder transverse, last joint ovate; coxal plates lanceolate. Sp. *A. cyanipennis*, Candèze, from Malacca.

Anathesis, Candèze, l. c. p. 21. Forehead carinated; third joint of palpi triangular; antennæ short, joints obtrigonal, last oblong, acuminate, second short, conical; coxal plates suddenly dilated within. Sp. *A. laconoides*, Candèze, from Malacca.

Melanthoides, Candèze, l. c. p. 23. Forehead flat; third joint of palpi obovate; antennæ short, first joint oblong; third to eleventh triangular; mesosternal fossulæ a little porrected at margins; coxal laminæ suddenly dilated within. Sp. *M. latimanus*, Cand. p. 24, from Grand-Bassam.

Heschatroxus, Candèze, l. c. p. 37. Fourth joint of the tarsi cordiform and bilobate. Sp. *Heschatroxus holosericeus*, Cand. l. c. p. 37, from the Moluccas.

Heligmus, Candèze, l. c. p. 52. Allied to *Pyrophorus*, but without thoracic vesicles. Sp. *H. glyphoderus*, Cand., from Brazil.

Negastrius, Thomson, Skand. Col. vol. vi. p. 110. Allied to *Cardiophorus*; basal striga of prothorax almost wanting, its sides distinctly margined; prosternal spine porrect, not short, slender; scutellum not cordate. Type *E. quadripustulatus* (Fab.).

*New species:—**(Agrypnides.)*

Agrypnus gilvus, Candèze, Elat. Nouv. p. 5, from Siam; and *A. rubiginosus*, Cand., ibid., from Sumatra.

Adelocera. Candèze describes the following new species of this genus: *Adelocera sparsa*, l. c. p. 6, from California; *A. linearis*, ibid., from Cayenne; *A. müllinii*, ibid., from Japan; *A. aurulenta*, ibid., from Ceylon; *A. lacerta*, l. c. p. 7, from Malacca; *A. geographica*, ibid., from Borneo; *A. mamillata*, ibid., from Cayenne; and *A. pectinata*, l. c. p. 8, from Cayenne.

Dilobitarsus cuneatus, Cand. l. c. p. 8, from Cayenne; and *D. cornutus*, ibid., from Guinea.

Lacon. Candèze describes the following new species: *Lacon cordicollis*, l. c. p. 9, from Japan; *L. apodixus*, ibid., from Luçon; *L. fibrinus*, ibid., from Sumatra; *L. macroderus*, l. c. p. 10, from Batchian; *L. fuliginosus*, ibid., from Japan; *L. trifasciatus*, ibid., and *L. ellensis*, ibid., from Ceylon; *L. bipapulatus*, l. c. p. 11, from China; *L. spurcus*, ibid., from Luçon; *L. glirinus*, ibid., from the Fiji islands; and *L. divaricatus* and *L. victoriæ*, ibid., from Australia.

(Melanactides.)

Melanactes schaumii, Candèze, l. c. p. 14, from California.

(Hemirhipides.)

Lycoreus cyclops, Candèze, l. c. p. 14, from Madagascar.

Alaiis. Of this genus Candèze describes nine new species: namely, *Alaiis vollenhovii*, l. c. p. 14, from Celebes; *A. cophura*, l. c. p. 15, from Cambodia and Malacca; *A. berus*, ibid., from Japan; *A. anguis*, ibid., from Laos; *A.*

regalis, l. c. p. 16, from Amboina, &c.; *A. cerastes*, ibid., from Batchian; *A. musivatus*, ibid., from Java; *A. funereus*, l. c. p. 17, from Australia; and *A. naja*, l. c. p. 18, from California.

Calais primaria, Cand. l. c. p. 18, from Cuba.

Tetrigus parryi, Cand. l. c. p. 18, from Port Natal.

(*Chalcolepidiides*.)

Campsosternus nietneri, Candèze, l. c. p. 19, from Ceylon; and *C. malaisianus*, Cand. ibid., from Pulo-Penang.

(*Tetralobides*.)

Tetralobus cylindriciformis, Candèze, l. c. p. 20, from Australia.

(*Elaterides*.)

Psephus æneolus, Cand. l. c. p. 20, from Old Calabar.

Sphenomerus mouhotii, Cand. l. c. p. 21, and *S. brunneus*, Cand. l. c. p. 22, from Siam.

Singhalenus horzfeldii, Cand. l. c. p. 22, from India.

Elius umbilicatus, Cand. l. c. p. 22, from Singapore.

Anoplischius clavus, Cand. l. c. p. 22, from Cayenne; and *A. ruficeps*, Cand. l. c. p. 23, from Cuba.

Eudactylus alboguttatus, Cand. l. c. p. 23, from Cayenne; *E. grandinii*, Cand. ibid., from Mexico.

Pachyderes apicalis, Cand. l. c. p. 24, from Malacca.

Monocrepidius. Candèze describes: *Monocrepidius sericeus*, l. c. p. 24, from Cayenne; *M. umbraculatus*, l. c. p. 25, from New Guinea; and *M. fasciatus*, ibid., from Borneo.

Æolus bifasciatus, Cand. l. c. p. 28, from Rio Janeiro; and *Æ. stolatus*, Cand. ibid., from Caraccas.

Heteroderes atlanticus, Cand. l. c. p. 26, from the Azores; and *H. pusillus*, Cand. ibid., from New Guinea.

Pityobius billingsii, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 69, from Canada West.

Anchastus. Of this genus Candèze describes eight new species: namely, *Anchastus terminatus*, l. c. p. 26, from Guadeloupe; *A. suturalis*, l. c. p. 27, from Mexico; *A. nigriceps*, ibid., from Java; *A. infumatus*, ibid., from Ceylon; *A. sericeus*, ibid., and *A. venustulus*, ibid., from Borneo; *A. lateralis*, l. c. p. 28, from Siam; and *A. longicornis*, ibid., from New Guinea.

Drasterius præses, Cand. l. c. p. 28, from California.

Elater azurescens, Cand., l. c. p. 29, from Japan; and *E. coccineus*, ibid., from the East Indies.

Megapenthes. Candèze describes: *Megapenthes opaculus*, l. c. p. 29, and *M. tenuatus*, l. c. p. 30, from Bengal; *M. agrotus*, ibid., from Cambodia; *M. linearis*, ibid., from Darjeeling; *M. juncus*, ibid., from Manilla; *M. agricultides*, l. c. p. 31, from New Guinea; *M. apicatus*, ibid., from Swan River; and *M. rufipes*, ibid., from Adelaide.

Melanoxanthus. Of this genus Candèze describes 21 new species: namely,

M. bifasciatus, l. c. p. 31, from Malacca; *M. epitrotus*, l. c. p. 32, from Singapore; *M. vittatus*, ibid., *M. guttulatus*, ibid., *M. quadrillum*, *M. flavangulus*, and *M. cuneatus*, l. c. p. 33, from Borneo; *M. physorhinulus*, *M. dolosus*, ibid., *M. inflexus*, *M. litura*, *M. signatus*, l. c. p. 34, and *M. albofasciatus*, l. c. p. 35, from Ceylon; *M. cobrella*, l. c. p. 34, from India; *M. subcylindricus*, l. c. p. 35, from Batchian; *M. quadrinotatus*, *M. rufinus*, ibid., and *M. pusillus*, l. c. p. 36, from Celebes; *M. promecus*, ibid., from Manilla; *M. abyssinus*, ibid., from Abyssinia; and *M. bilunatus*, ibid., from the Gaboon.

Deromecus suturalis, Cand. l. c. p. 37, from Chili.

Monadicus brunneipennis, Cand. l. c. p. 38, from Cayenne.

Cryptohypnus squamifer, Cand. l. c. p. 38, from Pará; *C. bruckii*, Cand. ibid., from the Pyrenees; and *C. fasciatus*, Cand. l. c. p. 39, from Borneo.

Coptostethus guttatus, Cand. l. c. p. 39, from the Cape of Good Hope; *Coptostethus gracilis*, Woll. Cat. Can. Col. p. 211, *C. obtusus*, Woll. l. c. p. 213, and *C. crassiusculus*, Woll. ibid., all from the Canaries.

Negastrius (g. n.) *boreaphilus*, Thomson, Skand. Col. vol. vi. p. 112.

Cardiophorus. Of this genus 13 new species are described by Candèze: namely, *Cardiophorus carduelis*, l. c. p. 39, from Singapore; *C. obliquus*, l. c. p. 40, from Ceylon; *C. basilaris*, ibid., from the Cape; *C. signatus*, ibid., from California; *C. aptopoides*, ibid., from Mexico; *C. floridæ*, l. c. p. 41, from Florida; *C. soricinus*, ibid., from Burmah; *C. chloroticus*, ibid., from W. Africa; *C. wahlbergii*, l. c. p. 42, from S. Africa; *C. damara*, ibid., from S. Africa; *C. spissus*, ibid., from Madras; *C. helferi*, ibid., from Burmah; and *C. nothus*, l. c. p. 43, from Japan.

Cardiophorus montanus, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 67, from the Colorado Territory.

Cardiotarsus ciliatus, Cand. l. c. p. 43, from Borneo; and *C. crocipes*, Cand. ibid., from the Cape.

Triplonychus fulvus, Cand. l. c. p. 44, from Pará; and *T. singulatus*, Cand. ibid., from Venezuela.

Horistonotus. Candèze describes *H. elisus*, l. c. p. 44, *H. lenis*, ibid., *H. xanthomus*, l. c. p. 45, *H. divisus*, ibid., and *H. humilis*, ibid., from Australia.

Diploconus. Of this genus Candèze describes: *D. spiloderus*, l. c. p. 45, from Malacca; *D. melanopterus* and *D. ambustus*, l. c. p. 46, from Sumatra; *D. erythropus*, ibid., from Ternate; *D. erythronotus*, ibid., and *D. ciprinus*, l. c. p. 47, from Luçon.

Melanotus. The following new species are described by Candèze: From Japan—*Melanotus invectitius*, l. c. p. 47; *M. senilis*, ibid.; *M. restrictus*, ibid.; *M. armosus*, l. c. p. 48; and *M. correctus*, ibid. From Java—*M. albivellus*, l. c. p. 48, and *M. bipunctatus*, l. c. p. 49. From Sumatra—*M. carinatus*, ibid.

Melanotus candezi, Stierlin, Berl. ent. Zeitschr. 1864, p. 149, from Sicily.

Limonijs discicollis, Cand. l. c. p. 49, from California; *L. marginellus*, Perris, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 284, from near Madrid.

Athois unciollis, Perris, l. c. p. 285, from Spain: *A. robustus*, Stierlin, l. c. p. 149, from Sicily; *A. peragalli*, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 247, from the south of France.

Athois. Candèze describes: *A. limoniiformis*, l. c. p. 50, from Tuscany;

A. longicornis and *A. pyrenæus*, *ibid.*, from the Pyrénées orientales; and *A. chloroticus*, *l. c.* p. 51, from Portugal.

Pyrophorus bifossulatus, *Cand. l. c.* p. 51, from Peru; *P. melanozanthus*, *Cand. ibid.*, from Venezuela; and *P. fulgurans*, *Cand. l. c.* p. 52, from Cayenne.

Corymbites selectus, *Cand. l. c.* p. 53, from Japan; *C. luzonicus*, *Cand. ibid.*, from Luçon; and *C. cirratipilis*, *Cand. l. c.* p. 54, from Malacca; *C. brunnipes*, *Bland, l. c.* p. 67, from Nebraska; and *C. nigricollis*, *Bland, l. c.* p. 68, from the Colorado Territory.

Chrosis barbata, *Cand. l. c.* p. 54, from Australia; and *C. æneola*, *Cand. ibid.*, from New Zealand.

Asaphes hirtus, *Cand. l. c.* p. 54, from California.

Penia fulva, *Cand. l. c.* p. 55, from Java.

Ludius lucidus, *Cand. l. c.* p. 55, from Java; *L. sericans*, *Cand. ibid.*, from Ceylon; and *L. ater*, *Cand. ibid.*, from California.

(*Campylides*.)

Dicronychus cinnamomeus, *Cand. l. c.* p. 56, from Bengal.

DASCILLIDÆ.

Hydrocyphon. De Marseul has published some remarks on this genus, and described the known species *H. deflexicollis* (Müll.). *L'Abeille*, tom. i. pp. xiii and xiv.

Thomson maintains that the genus *Eucinetus* (Germ.), generally referred to the family *Dascillidæ*, is shown, by its general characters, and also by the nature of the larvæ (as described by Perris), to belong rather to the Catopide group of the Necrophaga. *Öfversigt Kongl. Vet. Akad. Förhand.* 1863, p. 477.

Cyphon gracilicornis, sp. n., *Woll. Cat. Can. Col.* p. 214, from the Canaries.

Hydrocyphon australis, sp. n., *Linder, L'Abeille*, tom. i. p. xiv (April 1864).

MALACODERMATA.

Lampyrides.

Carus has published the results of some experiments on the phosphorescent matter of *Lampyris italica*. *Comptes Rendus*, 1864, 2^e semestre, p. 607.

Perngallo describes the habits of *Luciola lusitanica*. *Ann. Soc. Ent. Fr.* 4^e sér. tom. iii. pp. 661-665.

Telephorides.

DE MARSEUL has published a monograph of the *Telephorides* (*L'Abeille*, tom. i. pp. 1-108), which will be exceedingly serviceable to entomologists. He gives the following synopsis of the genera (in the original this is arranged on the dichotomous system) :—

I. Fold of the elytra visible at the base. Postepisternum sinuated within. Lateral margins of pronotum entire.

A. Head narrowed behind the eyes in the form of a neck. Pronotum circularly emarginate at the base PODABRUS.

B. Head more or less narrowed at base, but not forming a neck. Pronotum straight at base.

a. Outer claw usually furnished with a tooth at base, rarely bifid at apex; inner claw simple.

1. Pronotum transverse, rounded in front; lateral margins broad and arched. Maxillary palpi securiform, with the interior angle distinct, and the inner margin of considerable length TELEPHORUS.

2. Pronotum square or longer than broad, arched in front, nearly straight and narrowly margined on the sides. Maxillary palpi subovoid. Outer claw toothed ABSIDIA (Muls.).

b. Outer claw not toothed at base, bifid at the apex, like the inner one.

1. Last segment of abdomen rounded at its posterior angles, with no triangular expansion. Inflected margin of elytra ceasing at the level of the belly RHAGONYCHA.

2. Last dorsal segment of abdomen with its posterior angles dilated and forming a triangular expansion above the ventral segment. Inflected margin of elytra continued to the middle of the belly. PYGIDIA (Muls.).

II. Fold of the elytra not visible at the base. Postepisternum not sinuated within. Lateral margins of pronotum dentate or incised, at least in ♂.

SILIS (Muls.).

The total number of species recorded is 154: namely, of *Podabrus*, 7; of *Telephorus*, 81; of *Absidia*, 3; of *Rhagonycha*, 50; of *Pygidia*, 8; and of *Silis*, 5. A tabular synopsis of the species of each genus is given.

Bethe (Stett. ent. Zeit. 1864, p. 407) remarks, in opposition to Kiesenwetter, that the prothorax in the ♀ of *Silis ruficollis* (Fab.) is similar to that of the ♂, except that its posterior angles do not project so distinctly in the form of a tooth, and the pit within each hinder angle is destitute of the oblique ridge which occurs in the ♂. The sexual differences are very distinctly marked in the abdomen; but this part can only be accurately examined in fresh specimens. The lateral margins of the prothorax are emarginate in both sexes in many species of the genus *Silis*; Bethe mentions *S. 6-dentata* (Mann.), *S. pallida* (Eschsch.), and *S. familiaris* (Dohrn, MS.). He states that the best sexual characters in this genus are to be derived from the legs and antennæ, which are one-third thinner in the females than in the males, whilst in the latter the second joint of the antennæ is shorter than in the females. The legs are also lighter in colour in the ♀ (l. c. p. 408).

Reiche states that *Telephorus bilunatus* (Mars.) is a French species, and that Syria is probably erroneously given as its native country by De Marseul (*vide infra*). Bull. Soc. Ent. Fr. 1864, p. xxxi.

New genus:—

Pleolobus, Philippi, Stett. ent. Zeit. 1864, p. 278. Head free, transverse, produced and constricted behind the eyes; epistome distinct; prothorax transverse, trapezoidal; tarsi with fourth joint bilobed, with two large pulvilli beneath, last joint as long as the two preceding together; claws simple. Sp. *P. fuscescens*, Phil. p. 279, and *P. nigrinus*, Phil. *ibid.*, from Chili.

New species:—

Telephorus. Of this genus De Marseul (L'Abeille, tome i.) has described the following 15 new species:—*Telephorus rufidens*, l. c. p. 20, from Corsica; *T. bilunatus*, l. c. p. 22, from Syria; *T. rufifrons*, l. c. p. 25, from Sicily; *T. atratus*, l. c. p. 27, from Spain; *T. funebris*, l. c. p. 29, from Turkey; *T. prusiensis*, l. c. p. 33, from Asia Minor; *T. cyprius*, l. c. p. 36, from Cyprus; *T. antennalis*, l. c. p. 40, from Spain; *T. iliacus*, l. c. p. 41, from Asia Minor; *T. curtus*, l. c. p. 43, from Constantine and Tunis; *T. brullei* (= *T. bicolor*, Brulle) l. c. p. 49, from the Morea; *T. olympicus*, l. c. p. 57, from Mount Olympus; *T. bivittatus*, ibid., from Portugal and Spain; *T. meziendi*, l. c. p. 61, from Algeria; and *T. smyrnensis*, l. c. p. 109, from Smyrna.

The following new Chilian species are described by Philippi (Stett. ent. Zeit. 1864): *Telephorus subandinus*, l. c. p. 276; *T. heterocerus*, ibid.; *T. præcor*, l. c. p. 277.

Mastigocerus fulvus, Philippi, l. c. p. 277, from Chili. (Philippi remarks that this name should be written *Mastigocerus* and not *Mastinocerus*, as by Solier and Lacordaire.)

Rhagonycha. Of this genus De Marseul (L'Abeille, tome i.) describes the following nine new species: *Rhagonycha angusta*, l. c. p. 74, and *R. peyroni*, ibid., from Mount Taurus; *R. herbea*, l. c. p. 82, from Algeria; *R. limbipennis*, l. c. p. 85, from Spain; *R. plagiella*, ibid., from Spain; *R. kiesewetteri*, l. c. p. 90, from Cyprus; *R. fairmairei*, l. c. p. 91, from Spain; *R. ornaticollis*, l. c. p. 93, from Algiers; *R. bythinica*, l. c. p. 95, from Anatolia.

Rhagonycha limbata, Thomson, Skand. Col. vol. vi. p. 191 (= *Cantharis testacea*, Gyll. nec Linn.).

Malthodes atomus, Thomson, l. c. p. 202 (= *brevicollis*, Kies. nec Payk.); *M. distans*, Thoms. l. c. p. 204; and *M. limbicentris*, Thoms. l. c. p. 206.

Pygidia sicula, De Marseul, l. c. p. 100, from Sicily.

Silis neapolitana, De Marseul, l. c. p. 107, from Naples.

Drilides.

Malacogaster tilloides, Woll. Cat. Can. Col. p. 215, from Fuerteventura.

Melyrides.

Kraatz and Kiesenwetter have published (Berl. ent. Zeits. 1864, pp. 306–312) a revision of the species of the subgenus *Anthodytes*, of which they enumerate 8, namely:—

Group 1. Elytra rounded at apex in both sexes.

A. cyanipennis (Erichs.) l. c. p. 306, tab. 5. fig. 2; *A. flavilabris* (Waltl) = *Mal. tristis* (Luc.), l. c. p. 307; *A. mauritanicus* (Luc.) + *Mal. angusticollis* (Luc.) l. c. p. 308; *A. corniculatus* (n. sp.), l. c. p. 308. taf. 5. fig. 1, from Greece.

Group 2. Elytra in the male lacinated at apex.

A. ovalis (Lap.) = *M. cyanipennis* (Redt.), l. c. p. 309, tab. 5. fig. 3; *A. armifrons* (Kraatz), perhaps ♂ of *longicollis* (Erichs.), l. c. p. 310; *A. dispar* = *Charopus dispar* (Fairm.), l. c. p. 311.

* Species incertæ sedis. *A. longicollis* (Erichs.), l. c. p. 312.

Kraatz maintains, in opposition to Kiesenwetter, that his *Malachius græcus*

cannot be regarded as a variety of *M. bipustulatus*, as the antennæ are differently formed in the males of the two species. Kraatz also regards *M. lusitanicus* (Erichs.) as a distinct species, and states that his *M. armifrons* is not, as supposed by Kiesenwetter, the male of *Anthodytes longicollis* (Erichs.). The same author states that, after a fresh examination of the types, he is still of opinion that *Attalus jocosus* (Erichs.) is only a variety of *A. lateralis* (Erichs.). Berl. ent. Zeitschr. 1864, p. 134.

Kiesenwetter figures *Troglops corniger* (Kiesenw.), Berl. ent. Zeits. 1864, tab. 5. fig. 4; *T. cruentus* (Kiesenw.), l. c. fig. 5; and *T. silo* (Er.), thorax, l. c. fig. 6.

The genus *Ogocephalus* (Westwood) is described by Wollaston under the new name of *Cephaloncus* (Westw.), *Ogocephalus* being preoccupied. Cat. Can. Col. p. 229.

New species:—

Malachius. Perris describes four new species of this genus (Ann. Soc. Ent. Fr. 4^e sér. tome iv.): namely, *Malachius hispanus*, l. c. p. 286, and *M. tristis*, l. c. p. 287, from Spain; *M. tarsalis*, ibid., from Algiers; and *M. (Cyrstosus) bicolor*, l. c. p. 288, from Corsica.

Ebæus semitogatus, Fairm. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 641, *E. ogieri*, Fairm. ibid., and *E. chloroticus*, Fairm. l. c. p. 642, from Algeria.

Pecteropus scitulus, Woll. Cat. Can. Col. p. 218, from Gomera.

Attalus pallipes, Woll. l. c. p. 220, from the Canaries; *Attalus apicalis* Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 289, from Algiers.

Troglops corsicus, Perris, l. c. p. 290, from Corsica.

Anthocomus fenestratus, Linder, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 251, from the south of France.

Dasytes. Of this genus six new Chilean species are described by Philippi: *Dasytes leviusculus*, l. c. p. 273; *D. longicollis*, l. c. p. 274; *D. limbatus*, ibid., *D. ruficollis*, l. c. p. 275; *D. atrocaruleus*, ibid., *D. glabriculus*, ibid.

Dasytes pilicornis, Kiesenw. Berl. ent. Zeits. 1864, p. 388, tab. 4. fig. 10, from Lyons and Paris; *D. moniliatus*, Kiesenw. l. c. p. 389, tab. 4. fig. 11, from Crete; *D. borealis*, Thoms. Skand. Col. vol. p. 151.

Antidipnis galbula, Kiesenw. Berl. ent. Zeits. 1864, p. 387, tab. 5. fig. 7, *A. maculatus*, Kiesenw. ibid., tab. 5. fig. 8, from Sarepta.

Arthrobrachus. Of this genus eight new Chilean species are described by Philippi: namely, *Arthrobrachus quadripunctatus*, Stett. ent. Zeit. 1864, p. 271; *A. rufitarsis*, ibid.; *A. subaneus*, l. c. p. 272; *A. ruficornis*, ibid.; *A. marginatus*, ibid.; *A. scutellaris*, l. c. p. 273; *A. punctulatus*, ibid.; *A. serratimargo*, ibid.

CLERIDÆ.

Heyden (Berl. ent. Zeits. 1864, p. 322) gives diagnoses and full synonymy of the three species of *Thanasimus*:—*T. formicarius* (Linn.), *T. substriatus* (Geb.), and *T. rufipes* (Brahm).

(*Heterolobus*, g. n., Philippi, Stett. ent. Zeit. 1864, p. 354. This genus is placed by Philippi among the Heteromera, between the Anthicidæ and Mordellidæ, but without any indication of the family to which he believes it to belong. Head inserted to the eyes in the thorax; eyes globose; antennæ

with the three apical joints globose, forming a large club (resembling that of *Epiclides*); tarsi heteromerous, first two joints of posterior broad, nearly produced into a lobe beneath. The relations of the genus are rather with the Cleridæ than with the Trachelian Heteromera. Sp. *H. æneus*, n. sp., from Chili).

Thanasimus. R. A. and F. Philippi describe eight new Chilian species of this genus: *Thanasimus angustus*, Stett. ent. Zeit. 1864, p. 266; *T. æneus*, ibid., *T. ruficollis*, l. c. p. 267; *T. obscurus*, ibid.; *T. modestus*, ibid.; *T. viridis*, l. c. p. 268; *T. analis*, ibid.; *T. landbecki*, l. c. p. 269.

Corynetes æneus, sp. n., Philippi, l. c. p. 270, from Chili.

LYMEXYLONIDÆ.

Atractocerus. Westwood remarks upon the geographical distribution of the species of *Atractocerus*, which is represented in almost all parts of the world except Europe. He regards this wide distribution of a highly specialized form as inimical to the Darwinian hypothesis. Proc. Ent. Soc. Lond. 1864, p. 45.

Atractocerus kreusleræ, sp. n., Westw. Proc. Ent. Soc. Lond. 1864, p. 46, from S. Australia.

PTINIDÆ.

MULSANT and REY, "Coléoptères de France: Térédiles," divide that tribe into two families, as follows (l. c. p. 27) :—

No metasternal and ventral pits for the reception of the four posterior feet.

ANOBIENS.

Metasternal and ventral pits for the reception of the four posterior feet.

DORCATOMIENS.

The *Anobiens* are again divided into two sections :—

Antennæ not serrated within; last three joints very large, usually elongated. *Anobiaires*.

Antennæ serrated, pectinated, or even flabellated (♂) within; last three joints scarcely larger than preceding. *Xylétinaires*.

The *Dorcatomiens* are likewise divided into two sections (l. c. p. 310) :—

Antennæ distinctly serrated within *Mésocælopaïres*.

Antennæ not serrated; three last joints very large, much compressed, more or less dilated or produced within *Dorcatomaires*.

The French *Anobiaires* are referred by the authors to the following eight genera, as tabulated l. c. p. 29 :—

I. Antennæ of eleven joints.

A. Prothorax obtuse at the sides.

* Forehead much constricted anteriorly by the insertion of the antennæ. *Dryophilus* (Chevr.).

† Forehead broad, not constricted *Proibium* (Motsch.).

B. Prothorax with a projecting edge at the sides.

* Prothorax more or less excavated beneath to receive the head when inflexed. *Anobium* (Fab.).

† Prothorax not excavated beneath.

Intermediate coxæ distant. *Xestobium* (Motsch.).

Intermediate coxæ approximated. *Liozoum* (Muls.).

II. Antennæ of ten joints.

A. Last three joints of antennæ very large, elongated.

* Prothorax as broad as the elytra, its disk gibbous.

Oligomerus (Redt.).

† Prothorax narrower than the elytra, its disk not gibbous.

Amphibolus (g. n.).

B. Last three joints of antennæ large, compressed, dilated interiorly.

Gastrallus (Duval).The *Xylétinares* include seven genera, namely (*l. c.* p. 225):—

I. Prothorax not excavated beneath for the reception of the head.

A. Antennæ pectinated (♀) or flabellated (♂). *Philius* (Geoff.).B. Antennæ simply serrated *Ochina* (Steph.).

II. Prothorax more or less excavated beneath.

A. Last three joints of antennæ larger than the intermediate ones.

Tripopitys (Redt.).

B. Last three joints of antennæ not perceptibly larger than the intermediate ones.

* Metasternum with no projecting ridge behind its anterior margin.

a. Prothorax, seen from above, forming a transverse square.

Metholcus (Duval).

b. Prothorax distinctly narrowed in front.

α Last joint of palpi oblong, subfusiform. *Calypteris* (Muls.).

β Last joint of palpi more or less dilated and truncate at apex.

Xyletinus (Lat.).

† Metasternum with a fine transverse ridge behind its anterior margin.

Pseudochina (Duval).The *Mésocælopaïres*, the first section of the Dorcatomiens, includes only two genera, namely (*l. c.* p. 311):—Body oblong; elytra with a lateral stria; prosternal lamina carinulate; posterior epimera apparent; first ventral segment forming a narrow border beyond the transverse pits *Mesothés* (g. n.).Body ovoid; elytra with no lateral stria; prosternal keel simple; epimera not apparent *Mesocælopus* (Duval).Of the *Dorcatomaires*, Mulsant and Rey admit four genera (p. 328), namely:—

I. Metasternum not produced forward between the intermediate coxæ.

Theca (Muls.).

II. Metasternum produced between the intermediate coxæ in a lamina.

A. Body oval or suboval *Dorcatoma* (Herbst).

B. Body short, subhemispherical.

* Eyes deeply incised, subbilobate *Enneatoma* (g. n.).

† Eyes scarcely sinuated on the lower part of their inner margin.

Amblytoma (g. n.).*Anobium*. Mulsant and Rey (*Col. de France: Térédiles*, pp. 65–67) suggest the separation from this genus of several subgenera: *Dendrobium* (*A. denticolle* and *A. pectinax*), *Anobium* (*A. domesticum*), *Neobium* (*A. hirtum* and *tomentosum*), and *Artolium* (*A. paniceum*).*Xestobium plumbeum* (Ill.) forms the type of a new subgenus, *Hyperisus*, according to Mulsant and Rey, *l. c.* p. 129.

Ochina hederæ (Müll.) forms the subgenus *Cittobium*, Muls. & Rey, l. c. pp. 237 & 240.

Xyletinus ater (Panz.) forms the type of the subgenus *Sternoplus*, Muls. & Rey, l. c. pp. 263 & 264.

Pseudochina serricornis (Fab.) forms the type of a new subgenus, *Hypora*, Mulsant & Rey, l. c. pp. 294 & 306.

Frauenfeld describes the habits of *Anobium pini* (Sturm), the larvæ of which live two or three together in the buds of *Pinus sylvestris*. Verh. zool.-bot. Ges. in Wien, xiv. p. 386.

The "Report of the Commission appointed to inquire into the causes of decay in wood carvings" (London, 1864, pp. 16) contains an account by Westwood of the general history of the most injurious of the wood-boring Beetles, namely, *Ptilinus pectinicornis*, *Anobium striatum*, and *A. tessellatum*. The best remedial process for the treatment of woodwork threatened with destruction by these insects appears to be exposure to the vapour of benzine.

According to Kraatz, *Pinus coarcticollis* (Sturm) is a distinct species. Berl. ent. Zeits. 1864, p. 134. Kraatz also states that *P. raptor* (Sturm) is quite distinct from *P. bidens* (Oliv., Boield.), to which Boieldieu refers it, l. c. p. 135.

Heyden (Berl. ent. Zeits. 1864, p. 323) gives the following synonymy of the two European species of *Pseudochinus*:—

1. *Ps. lævis*, Ill. = *testaceus* (Redt., Bose) = *redtenbacheri* (Bach) = *ochraceus* (Sturm) = *cardui* (Dej.) = *lævis* (Duftschm.).

2. *Ps. testacea* (Duff.) = ? *serricornis* (Fab.) = *testacea* (Sturm, Bach).

Chevrolat states that the genus *Liozoum* (Muls.) is identical with his genus *Conopheribium*. Bull. Soc. Ent. Fr. 1864, p. xvii.

New genera :—

Amphibolus, g. n., Muls. & Rey, Col. de Fr. Térédiles, p. 204 (see table). Sp. *Anobium gentile* (Rosenh.) and *Gastrallus striatellus* (Brisout).

Mesothus, g. n., Muls. & Rey, l. c. p. 311 (see table). Sp. *Xyletinus ferrugineus* (Muls.).

Enneatoma, g. n., Muls. & Rey, l. c. p. 367 (see table). Sp. *Dorcatoma subalpina* (Bon.), *D. affinis* (Sturm), and *E. subglobosa*, sp. n., p. 377.

Amblytoma, g. n., Muls. & Rey, l. c. p. 381 (see table). Sp. *Dorcatoma rubens* (Ent. Hefte) and *A. cognata*, sp. n., p. 388.

Ocelliger, Philippi, Stett. ent. Zeit. 1864, p. 283. Allied to *Dorcatoma*. Forehead with a median red ocellus; antennæ short, in ♂ 10-jointed, pectinated; in ♀ 9-jointed. Sp. *O. ater*, n. sp., from Chili.

New species :—

Pinus foncki, Philippi, Stett. ent. Zeit. 1864, p. 280, from Chili.

Mezium hirtipenne, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 241, from Algeria.

Sphaericus impunctipennis, Woll. Cat. Can. Col. p. 241, and *S. crotchianus*, Woll. l. c. p. 242, from Gomera.

Anobium pullum, Philippi, l. c. p. 280, and *A. hæmorrhoidale*, Phil. l. c.

p. 281, from Chili; *A. cryptophagoides*, Woll. l. c. p. 250, from Hierro; *A. cælatum*, Muls. & Rey, Col. de Fr., Térédiles, p. 81; *A. fagicola* (Chevr. MS.), Muls. & Rey, l. c. p. 89 (= *A. fagi*, M. & R. olim).

Liozöim crassiusculum, Muls. & Rey, l. c. p. 175.

Xyletinus oblongulus, Muls. & Rey, l. c. p. 279.

Pseudochina apicata, Muls. & Rey, l. c. p. 295; *P. fulvescens*, Muls. & Rey, l. c. p. 301.

Ptilinus lepidus, Woll. l. c. p. 251, from the Canaries.

Calymmaderus grandis, Philippi, l. c. p. 281, from Chili.

Mesocælopus collaris, (Chevr. MS.), Muls. & Rey, l. c. p. 324.

Dorcatoma punctulata, Muls. & Rey, l. c. p. 346; *D. setosella* (Guillebeau MS.), Muls. & Rey, l. c. p. 356; *D. externa*, Muls. & Rey, l. c. p. 367, note, from Algeria.

Dorcatoma. Three new Chilian species are described by Philippi: *Dorcatoma bimaculatum*, l. c. p. 281; *D. nigrum*, l. c. p. 282; *D. rubrum*, ibid.

CISSIDÆ.

Cis pruinosulus, sp. n., Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 291. France.

MELASOMATA.

Erodiides.

Arthodes. Of this genus Wollaston describes ten new Canarian species: namely, *Arthodes inflatus*, Cat. Can. Col. p. 439; *A. hyrrhoides*, l. c. p. 441; *A. hartungii*, l. c. p. 442; *A. punctatulus*, l. c. p. 443; *A. parcepunctatus*, ibid.; *A. subciliatus*, l. c. p. 444; *A. costifrons*, l. c. p. 445; *A. malleatus*, l. c. p. 446; *A. emarginatus*, l. c. p. 447; *A. geotrupoides*, ibid.

Tentyriides.

New genera:—

Paivæa, Woll. Cat. Can. Col. p. 449. Allied to *Tentyria*. Body covered with elongate erect hairs; epistome acutely produced at apex; last joint of antennæ obliquely truncate; prothorax broad in front, bisinuate at base, posterior angles distinctly marked; scutellum very short, transverse; elytra margined at the base; antennæ and legs robust, pilose. Type *Tentyria hispida* (Brullé).

Melanochrus, Woll. l. c. p. 467. Allied to *Gnophota* and *Oxycara*. Body ovate, convex; epistome minutely serrated, and mucronate in the middle; lobe of prosternum terminated at anterior coxæ, mesosternum not emarginate in front; scutellum distinct; terminal joint of maxillary palpi oval-securiform, of labial elongate-oval, acuminate; anterior legs fossorial, robust; tibiæ broad, simple externally, internally bicalcarate at apex; first joint of tarsi rather long. Sp. *M. lacordairii*, Woll. p. 468, from Lanzarote and Fuerteventura.

New species:—

Thinobatis intermedia, Philippi, Stett. ent. Zeit. 1864, p. 327, from Chili.

Itegeter costipennis, Woll. l. c. p. 457, and *I. subrotundatus*, Woll. l. c. p. 459, from Grand Canary.

Micipsa cavifrons, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 642, from Algeria.

Thalpophila. Of this genus Wollaston describes three new Canarian species: *Thalpophila plicifrons*, l. c. p. 461; *T. deyrollei*, l. c. p. 462; and *T. submetallica*, l. c. p. 464.

Gnophota inequalis, Woll. l. c. p. 446, and *G. punctipennis*, Woll. l. c. p. 467, from Grand Canary.

Epitragides.

Nyctopetus. Philippi describes six new Chilean species of this genus: *Nyctopetus laticollis*, l. c. p. 327; *N. parvus*, l. c. p. 328; *N. carbonarius*, l. c. p. 329; *N. rubripes*, ibid.; *N. carinatus*, l. c. p. 330; *N. nitidus*, l. c. p. 331.

Geoborus pilosus, sp. n., Philippi, l. c. p. 331, from Chili.

Scaurides.

Scaurus angustus, sp. n., Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 242, from Algeria.

Gonogenius brevis, sp. n., Philippi, l. c. p. 336, and *G. læviusculus*, Phil. ibid., from Chili.

Scotobius crenicollis, sp. n., Philippi, l. c. p. 337, from Chili.

Blaptides.

Nycterinus. Four new Chilean species are described by Philippi: *Nycterinus lævigatus*, l. c. p. 345; *N. gracilipes*, ibid.; *N. angusticollis*, l. c. p. 346; *N. abbreviatus*, l. c. p. 357.

Nycteliides.

Gyriosomus angustus, sp. n., Philippi, l. c. p. 347, from Chili.

Psectrascelis? *rugicollis*, sp. n., p. 332, from Chili.

Callyntra. Chilean species described by Philippi: *Callyntra laticollis*, l. c. p. 333; *C. carbonaria*, l. c. p. 334; *C. nitida*, l. c. p. 335.

Pimeliides.

Stierlin records the occurrence in Sicily of *Pimelia angulata* (Fab.), a species hitherto unknown in Europe. Berl. ent. Zeitschr. 1864, p. 149.

Pimelia. Wollaston describes four new Canarian species of this genus: *Pimelia ascendens*, l. c. p. 473; *P. ambigua*, l. c. p. 475; *P. costipennis*, l. c. p. 476; and *P. granulicollis*, l. c. p. 478.

Molurides.

Mohoris (*Phanerotoma*) *rowleiana*, sp. n., Westwood, Proc. Ent. Soc. Lond. 1864, p. 2, from the Zambesi.

Praocides.

Praocis. Numerous new Chilean species of this genus are described by Philippi:—*Praocis nitidicollis*, l. c. p. 337; *P. lævicollis*, l. c. p. 338; *P. (Anthrasomus) pubens*, l. c. p. 339; *P. (Anthr.?) consobrina*, ibid.; *P. (Anthr.?) rotundicollis*, l. c. p. 340; *P. bicostata*, l. c. p. 341; *P. angustata*, ibid.; *P. elliptica*, l. c. p. 342; *P. pubescens*, ibid.; *P. (Anthrasomus) hi pidula*, l. c. p. 343; *P. (Anthr.) laticollis*, ibid.; *P. angulifera*, l. c. p. 344.

Coniontides.

Crypticus punctatissimus, sp. n., Woll. l. c. p. 480; *C. canariensis*, sp. n., Woll. l. c. p. 481 (= *C. glaber*, Brullé nec Fab.); and *C. oblongus*, sp. n., Woll. l. c. p. 482, from the Canaries.

Pedinides.

Melasma, g. n., Woll. l. c. p. 484. Allied to *Helioopathes*. Prothorax scarcely emarginate at apex, truncate at base, posterior angles obtuse; legs slender, tibial spurs small, anterior tibiæ not dilated. In ♂ tibiæ very minutely serrated within, the anterior with a minute spine before the middle; anterior tarsi dilated, pilose above, spongy beneath. Type *M. lineatum* (Brullé).

Opatrides.

Melansis, g. n., Woll. l. c. p. 491. Nearly allied to *Phylax*. Anterior tibiae in both sexes narrow and somewhat flexuose; all the tibiæ in ♂ minutely serrated towards the apex; elytra highly and sharply costate, not punctate. Type *Phylax costatus* (Brullé); *Melansis angulata*, sp. n. Woll. l. c. p. 492, from Palma.

Sclerum asperulum, sp. n., Woll. l. c. p. 486, from Grand Canary.

Opatrum lutosum, sp. n., Woll. l. c. p. 486; and *O. oblitum*, Woll. l. c. p. 489, from the Canaries.—*Opatrum lefranci*, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 643, from Algeria.

Trachyscelides.

Pseudanemia, g. n., Woll. l. c. p. 492. Nearly allied to *Anemia*; all the palpi much elongated; antennæ of ten joints, with an abrupt, elongated, 4-articulate club. Sp. *P. brevicollis*, Woll. l. c. p. 493, from Lanzarote.

Bolitophagides.

Trachyderas, g. n., Philippi, Stett. ent. Zeit. 1864, p. 349. Allied to *Bolitophagus*; head inserted nearly to the eyes, not dilated in front of the eyes; last joint of maxillary palpi oblong-ovate, truncate; antennal club 3-jointed, perfoliate; prothorax narrowly margined, and not toothed at the sides. Sp. *T. cancellatum*, Phil. l. c. p. 350, from Chili.

Ulomides.

Hypophlæus subdepressus, sp. n., Woll., l. c. p. 499, from Fuerteventura.

Tenebrionides.

Tenebrio olivensis, sp. n., Woll., l. c. p. 501, from Fuerteventura.

Boromorphus parvus, sp. n., Woll. l. c. p. 502, from the Canaries.

Cyphaleides.

Cyphaleus? *valdivianus*, sp. n., Philippi, l. c. p. 350, from Chili.

Helopides.

Helops. Of this genus Wollaston describes 10 new Canarian species: namely, *Helops altivagans*, l. c. p. 503; *H. elliptipennis*, ibid.; *H. congener*, l. c. p. 504; *H. aterrimus*, l. c. p. 506; *H. nitens*, ibid.; *H. rimosus*, l. c. p. 508; *H. porrectus*, ibid.; *H. æthiops*, l. c. p. 509; *H. picescens*, ibid.; and *H. fusculus*, l. c. p. 511.

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Heliofugus (= *Euschatia*) *cryptocephalus*, sp. n., Philippi, l. c. p. 348, and *H. tenuipunctatus*, sp. n., Phil. l. c. p. 349, from Chili. (Philippi remarks on the hybrid nature of the name *Heliofugus*, which, however, has the priority over Solier's name *Euschatia*. The word should have been *Phyxelius*.)

CISTELIDÆ.

According to Heyden (Berl. ent. Zeits. 1864, p. 324), *Isomira ochropus* (Küst.) is a var. of *I. murina*, and *I. icteropa* (Küst.) is probably a var. of *I. hypocrita*. *Mycetocharis linearis* (Redt.) is the ♂, and *M. morio* (Redt.) the ♀ of *M. maurina* (Muls.), and *M. linearis* (Panz.) the ♂ of *M. brevis* (Gyll.).

Cistella (sic) *amplicollis*, sp. n., Linder, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 251, from Hungary.

Cistela nitidula, Thomson, Skand. Col. vol. vi. p. 286 (= *Prionychus melanarius*, Küst. ? = *Prionychus ater*, Redt.).

Dictopsis (for *Dietopsis*) *atra*, Philippi, Stett. ent. Zeit. 1864, p. 352, from Chili.

PYTHIDÆ.

Rhinosimus valdivianus, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 352, from Chili.

MELANDRYIDÆ.

Heyden states (Berl. ent. Zeits. 1864, p. 325) that *Dircæa repanda* (Dej.) = *Orchesia undulata* (Kraatz); and that *D. parreyssii* (Muls.) = *modesta* (Parr.).

Fairmaire records the occurrence in Algeria of *Abdera quadrisfasciata*. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 644.

**Chinocara tetratoma*, sp. n., Thomson, Skand. Col. vol. vi. p. 309 (= *Orchesia micans* var. *b*, Zett. = *O. sepicola*, Rosenh. ?).

Tetratoma baudueri, sp. n., Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 292, from the S. of France.

LAGRIIDÆ.

Lagria poupillieri, sp. n., Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 243, from Algeria.—*Lagria parvula*, sp. n., Perris, ibid. p. 291, from Spain (Escurial).

ANTHICIDÆ.

According to Kraatz, *Anthicus lateralis* (Küster) is a variety of *A. minutus* (Laf.); *A. schaumii* (Woll.) is a variety of *A. tristis* (Schmidt); *A. nigriceps* (Mann.) is identical with *A. flavipes* (Laf.); *A. posticus* (Laf.) is a variety of a species resembling *A. olivaceus* (Laf.) in coloration, but having a shorter prothorax. Berl. ent. Zeits. 1864, p. 136.

Kraatz also remarks upon the alliances of *Anthicus titbalis* (Waltl), l. c. p. 137, and states that *A. zonatus* (Laf.) is probably a variety of *A. fasciatus* (Laf.), and *A. vespertinus* (Rosenh.) a variety of *A. sanguinicollis* (Laf.), ibid.; *A. mylabrinus, dejeanii*, and *corsicus* (Laf.), which appear to occur only in Corsica and Sardinia, are distinguishable from similar varieties of *A. sanguinicollis* by their close and fine punctation (ibid., note). *A. agilis* (Küster) appears to be a variety of *A. instabilis* (Laf.), l. c. p. 138.

Anthicus. The following seven new Canarian species are described by Wollaston: *Anthicus opaculus*, Cat. Can. Col. p. 519; *A. notoxoides*, l. c. p. 520; *A.*

dimidiatus, l. c. p. 521; *A. lapidosus*, ibid.; *A. guttifer*, l. c. p. 522; *A. canariensis*, ibid.; and *A. scydmaenoides*, l. c. p. 524.

Anthicus quisquilius, sp. n., Thomson, Skand. Col. vol. vi. p. 360 (= *Anthicus floralis* var. *b*, Gyll.).

Oechthenomus senilis, sp. n., Woll. l. c. p. 525, from Palma.

Formicomus quadriguttatus, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 353, and *F. breviculus*, sp. n., Phil. ibid., from Chili.

PYROCHROIDÆ.

Macratrìa lepriœuri, sp. n., Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 243, from Algeria.

Notoxus lobicornis, sp. n., Reiche, l. c. p. 244, from Algeria.

PEDILIDÆ.

Pedilus cyanipennis, sp. n., Bland, Proc. Ent. Soc. Phil. vol. iii. p. 254, from Virginia.

Xylophilus oculatissimus, sp. n., Woll. Cat. Can. Coll. p. 525, from Palma; *X. pentatomus*, sp. n., Thomson, Skand. Col. vol. vi. p. 371, and *X. flavus*, sp. n., Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 644, from Algeria.

MORDELLIDÆ.

Mordella krausei, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 355, and *M. violascens*, Phil. ibid., from Chili.—*M. fasciata*, sp. n., Thomson, Skand. Col. vol. vi. p. 292.

Mordellistena. Eleven new species from Illinois are described by Helmuth, Proc. Ac. Nat. Sc. Phil. 1864, p. 105: viz. *M. nigricollis*, *M. dimidiata*, *M. hiplagiata*, *M. bipustulata*, *M. rubrilabris*, *M. picilabris*, *M. guttulata*, *M. scalaris*, *M. fusco-atra*, *M. suturella*, and *M. rufiventris*.

Mordellistena sericata, sp. n., Woll. Cat. Can. Col. p. 515, from the Canaries.

MELOIDÆ.

Philippi (Stett. ent. Zeit. 1864, pp. 356, 357) states that specimens, agreeing with the descriptions given by Germain of his *Meloë picipes* and *M. anthracinus*, occur with both divided and undivided claws; so that it would appear that the characters derived from the claws are of no great importance. Specimens of *M. cancellatus* (Sol.) from Corral differ from Solier's description by having a wrinkled head, and a broad, strongly rugose prothorax.

Meloë nudus, sp. n., Woll. Cat. Can. Col. p. 514, from Fuerteventura; and *M. subcyaneus*, Woll. ibid., from Lanzarote.

Meloë hæmopterus, sp. n., Philippi, l. c. p. 355; *M. flavipennis*, Phil. l. c. p. 356; and *M. pictus*, Phil. ibid.: from Chili.

Meloë (sic) *afer*, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 70, from Nebraska.

Lytta tarsalis, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 71, from Illinois.

Diaphorocera chrysoprasis, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 644, from Algeria.

Lydus rufulus, Fairm. l. c. p. 645, from Algeria.

CEDEMERIDÆ.

Kraatz states that the peculiar formation of the antennæ in *Cedemera brevicornis* (Schmidt) is due to a deformity, and that the insect is identical with

Heliofugus (= *Euschatia*) *cryptocephalus*, sp. n., Philippi, l. c. p. 348, and *H. tenuipunctatus*, sp. n., Phil. l. c. p. 349, from Chili. (Philippi remarks on the hybrid nature of the name *Heliofugus*, which, however, has the priority over Solier's name *Euschatia*. The word should have been *Phyxelius*.)

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Cistela nitidula, Thomson, Skand. Col. vol. vi. p. 286 (= *Prionychus melanarius*, Küst. ? = *Prionychus ater*, Redt.).

Dictopsis (for *Dietopsis*) *atra*, Philippi, Stett. ent. Zeit. 1864, p. 352, from Chili.

PYTHIDÆ.

Rhinosinus valdivianus, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 352, from Chili.

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Heyden states (Berl. ent. Zeits. 1864, p. 325) that *Dircæa repanda* (Dej.) = *Orchesia undulata* (Kraatz); and that *D. parreyssii* (Muls.) = *modesta* (Parr.).

Fairmaire records the occurrence in Algeria of *Abdera quadrfusciata*. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 644.

**Clinocara tetratoma*, sp. n., Thomson, Skand. Col. vol. vi. p. 309 (= *Orchesia nican* var. *b*, Zett. = *O. sepicola*, Rosenh. ?).

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Diaphorocera chrysopraxis, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 644, from Algeria.

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Æ. cyanescens, and that *Æ. scarmatica* (Mouraw.) is only a variety of *Æ. croceicollis* (Sahlb.). Berl. ent. Zeitschr. 1864, pp. 135 and 136.

Stierlin describes Sicilian varieties of *Ædemera melanopyga* (Kunze) and *Æ. flavipes*. Berl. ent. Zeitschr. 1864, pp. 149 and 150.

Ædemera (sic) *cuprata*, sp. n., Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 245, from Algeria.

Cycloderus binotatus, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 357; and *C. magellanicus*, sp. n., Phil. ibid., from Chili.

Nacerdes aurora, sp. n., Fairm. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 645, from Algeria.

Chitona baulnyi, sp. n., Fairm. l. c. p. 646, from Algeria.

CURCULIONIDÆ.

General remarks on the family :—

Under the title of "Outlines of a Natural System of the Rhynchophora," KRAATZ has published an attempt at a new classification of those Beetles, with remarks on the system adopted by Lacordaire (Berl. ent. Zeitschr. 1864, pp. 154–170). Lacordaire's primary divisions of this group are founded upon the extent to which the maxillæ are concealed by the mentum: those in which the maxillæ are entirely or almost concealed form his group of *Adelognathes*; those in which they are exposed are denominated *Phanerognathes*. Kraatz proposes, on the contrary, to take the length of the scape as the primary character in his classification, and in this way to divide the entire group of the Rhynchophora into three chief divisions,—namely, those with straight antennæ, without a distinct scape; those with a long scape, reaching beyond the anterior margin of the eyes; and those with a short scape, reaching only to the eyes. His proposed arrangement is shown in the following Table :—

WITHOUT A SCAPE, WITH STRAIGHT ANTENNÆ.

<i>Cybehides</i> , Lac. Curc. Phan. Synm. Phal. ii. Sect. A. p. 539.	
<i>Attelabides</i> , Lac. p. 540.	
<i>Rhinomacérides</i> , Lac. p. 551.	
<i>Belides</i> , Lac. Phal. i. Sect. B. ii. p. 522.	
<i>Ithycérides</i> , Lac. Sect. B. i. p. 405.	
? <i>Magdalinides</i> , Lac. Phal. ii. Sect. A. p. 570.	
<i>Eurhynchides</i> , Lac. Phal. i. Sect. B. ii. p. 527.	
<i>Cylades</i> , Lac. p. 529.	
<i>Apionides</i> , Lac. p. 531.	

WITH A LONG SCAPE; ADELOGNATHOUS.

<i>Myorhinides</i> , Lac.	<i>Eremnides</i> , Lac.
<i>Otiorhynchides</i> , Lac. + <i>Dichotrachelus</i> .	<i>Leptopsides</i> , Lac.
<i>Brachydérides</i> , Lac. + <i>Scythropus</i> .	

WITH A SHORT SCAPE; PHANEROGNATHOUS; THIRD TARSAL JOINT SIMPLE.

<i>Microcérides</i> , Lac.	<i>Brachycérides</i> , Lac.
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The first of these sections is not recognized by Lacordaire, who places its members among his *Phanérognathes*, and, indeed, refers the most important of the tribes, such as the *Apionides*, *Attelabides*, and *Rhinomacérides*, to a position between *Eirrhinus* and *Balaninus*—an arrangement which, as indicated by Kraatz, cannot be maintained upon any consideration of the natural affinities of the different forms. The author subjects Lacordaire's classification of the Rhynchophora to a thorough analysis, of course with the object of supporting his own views; many important points are brought prominently forward, but it would be impossible, without transferring the article almost entire to these pages, to give any clear idea of his course of argument.

KIESENWETTER has some remarks on Lacordaire's classification of the Curculionidæ, which he adopts with some modifications (Berl. ent. Zeitschr. 1864, pp. 239-252). He gives a catalogue of the Rhynchophora of Greece, with descriptions of new genera and species, and diagnoses of those not described in Schönherr's Monograph.

Notes on known genera and species:—

In a memoir which has been prepared with the greatest care, although its author contents himself with giving it the modest title of "Notes" (Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 329-382), ALLARD has published a revision of the known species of the genus *Sitones*, of which he describes 56. On the general geographical distribution of these species he remarks that they are met with only in cold or temperate regions, as, with the exception of one species from Mexico, he has seen none from countries south of 30° N. lat. Many of them are widely distributed, as will be seen from the following enumeration:—Of the 56 species, 5 are peculiar to Africa; 2 are peculiar to America; 2 are peculiar to Asia; 2 occur in America, Asia, and Europe; 1 occurs in America, Africa, and Europe; 2 occur in Africa, Asia, and Europe; 1 occurs in Asia and Europe; 18 occur in Europe and Algeria; and 23 are peculiar to Europe.

The species are characterized in an elaborate analytical table, and fully described, with their synonymy.

Hyperc. Kiesenwetter states (Berl. ent. Zeitsch. 1864, p. 266, note) that the structure of the hairs or scales clothing the insects of this genus may be employed in the discrimination of the species. Three groups may thus be distinguished, namely:—

1. Elytra with simple adpressed hairs or scale-like hairs.

Sp. *H. viennensis*, *cyrtu*, *turbata*, *salvia*, *elegans*, *pallumbaria*, *comata*, *variegata*.

2. Elytra with furcate scales.

Sp. *H. fuscata*, *contaminata*, *elongata*, *tigrina*, *striata*, *meles*, *constans*, *nigrirostris*, *variabilis*, *polygoni*.

3. Elytra with rounded scales.

Sp. *H. crinita*, *circumvaga*, *punctata*, *philanthus*, *lunata*, *arundinis*, *rumicis*, *kunzei*, *visnagæ*. *H. suspiciosa*, *vicieæ*, and *pastinacæ* are intermediate forms, having roundish scales with two points at the apex.

Nanophyes. Kiesenwetter divides this genus into the following groups (Berl. ent. Zeits. 1864, pp. 284-286):—

I. Tarsi with a single claw. (Subg. *Nanodiscus*.)

Sp. *N. transversus* (Aubé).

II. Claws united nearly to apex; forehead not very convex; club of antennæ with three distinct joints, funiculus 5-jointed. (Subg. *Sphærule*.)

Sp. *N. siculus*, *annulatus*, *hemisphæricus*, *lythri*, *ulmi*, *sahlbergi*, *brevis*, (Sch. nh.) (= ? *brevicollis*, Brisout), *chevrièrii* (= *gracilis*, Redt. = *spretus*, Duv.), and two n. sp.

III. Claws quite separate; forehead convex; club of three approximate or amalgamated joints. (Subg. *Nanophyes*.)

a. Funiculus 6-jointed.

Sp. *N. pallidus*, *tamarisci*, *languidus*, *nitidulus*, *tetrastigma*.

b. Funiculus 4-jointed.

Sp. *N. pallidulus* and *posticus*; *sexpunctatus*, n. sp.

Apion. Wencker (L'Abeille, tome i. pp. 109-270) has published a revision of the known species of this genus. The total number of species described by the author is 201. The author retains the genus in its original compass, and does not admit the generic distinctness of *Oxystoma* as defined either by Duméril or Stephens. He divides the genus into the following groups:—

Group 1. SUBULIROSTRES, including 8 species. (Type *A. pomonæ*, Fab.)

Group 2. FILIROSTRES, including all the remainder, and subdivided as follows:—

Division 1. Claws appendiculate; 4 species. (Type *A. rugicolle*, Germ.)

Division 2. Claws simple or dilated at base, sometimes dentiform.

Subdiv. 1. Fourth joint of tarsi elongated, longer than two preceding united; 2 species. (Type *A. tamarisci*, Gyll.)

Subdiv. 2. Fourth joint of tarsi short.

Section 1. *Longirostres*; 159 species. (Type *A. carduorum*, Kirby.)Section 2. *Brevirostres*; 28 species. (Type *A. frumentarium*, Linn.)

Baer has translated the analytical tables of Stierlin's monograph of the European species of *Otiiorhynchus*, originally published in the 'Berliner entom. Zeitschrift' for 1862 (Ann. Soc. Ent. Fr. 4^e série, tome iv. pp. 159-180).

According to Kraatz, *Sitones ocellatus* (Küster) is identical with *S. gemellatus* (Schönh.) and *S. vestitus* (Waltl), a variety of *S. variegatus* (Schönh.), as is also *S. cachecta* (Schönh.). Berl. ent. Zeitschr. 1864, p. 138.

The same author states that *Sciaphilus meridionalis* (Bohem.) is the female of *Chiloncus siculus*: l. c. p. 38.

Phytonomus signatus (Schönh.) and *P. aurifluus* (Waltl), according to Kraatz, are identical with *P. melarhynchus* (Oliv.). Kraatz also states, in opposition to Schaum, that *P. balteatus* (Chev.) is distinct from *P. variabilis* (Schönh.): l. c. p. 138.

Tychius suturalis (Brisout) is identical with *T. cinnamomeus* (Kiesenw.), and *T. procerulus* (Kiesenw.) with *T. cuprifer* (Panz.), according to Kraatz, l. c. p. 139.

According to Rye (Ent. M. Mag. vol. i. p. 168), *Tychius brevicornis* (Waterh.) is identical with *T. pygmaeus* (Barneville).

Kraatz regards *Dichotrachelus bigorrensis* (Bonvoul.) and *D. linderi* (Fairm.) as the sexes of the same species: l. c. p. 139.

The same author states that *Styphlus verrucosus* (Kiesenw.) belongs to the genus *Dichotrachelus*, and is probably identical with *D. muscorum* (Fairm.); and that *Trachyphlaeus larraldi* (Perris) belongs to the genus *Cænopsis* (Bach.), l. c. p. 140.

Aubé states that *Omius concinnus* (Bohem., Schönh.) is identical with *O. oblongus* (Bohem.), *O. raymondi* and *O. marqueti* (Gautier des Cottés), and *O. mandibularis* (Chevr.), and explains the means by which this confusion has arisen. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 314.

According to Perris, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 310, *Barynotus auro-nubilis* (Fairm.) = *B. umbilicatus* (L. Duf.), *Plinthus nivalis* (Duval) = *P. imbricatus*, *Anthonomus juniperi* (Chevr.) = *Nanophyes transversus* (Aubé), *Baridius vestitus* (Perris) = *B. scolopaceus* (Germ.), *Rhyncholus crassirostris* (Perris) = *R. elongatus* (Gyll.).

According to Kiesenwetter and Von Heyden (Berl. ent. Zeits. 1864, pp. 277 & 326), *Magdalinus claviger* (Küst.) = *barbicornis* ♂; *Magdalinus languidus* (Schönh.) is to be struck out of the European list, that species being a native of Brazil.

Kiesenwetter regards *Tanymecus dilatatus* (Schaufuss) as identical with *T. dilaticollis* (Schönh.), Berl. ent. Zeits. 1864, p. 254. According to the same author *Otiarhynchus impressicollis* (Brullé) = *O. lugens* (Germ.), l. c. p. 256; *Pygloffius varius* (Brullé) is probably identical with *P. pictus* (Schönh.), l. c. p. 263; *Larinus subcostatus* (Brullé) probably = *L. cardui* (Rossi), l. c. p. 269; *Larinus rufulus* (Schönh.) is probably = *Cure. bicolor* (Panz.), l. c. p. 271; *Apion semivittatum* (Schönh.) = *pallidactylum* (Schönh.) = *germari* (Waltl), l. c. p. 287; *Auletes ilicis* (Gené) = *A. politus* (Schönh.), and *A. cisticola* (Fairm.) = *A. pubescens* (Kiesenw.), l. c. p. 290; *Baridius violaceus* (Schönh.) = *B. angustus* (Brullé), l. c. p. 291.

Wencker proposes the name of *Apion variegatum* for *A. bicolor* (Gredler), the latter name having been preoccupied by Gerstaecker. L'Abeille, tome i. p. 188.

Stierlin describes a very large variety (?) of *Acalles denticollis* from Sicily. Berl. ent. Zeitschr. 1864, p. 151.

Kiesenwetter gives a revised character of his genus *Hypoglyptus*. Berl. ent. Zeits. 1864, p. 272.

Snellen van Vollenhoven describes the variations of *Apoderus quadripunctatus* (Schönh.) and *A. hystrix* (Fab.). Tijdschr. voor de Dierkunde, 1864, pp. 166 & 167.

The following known species are figured by Kiesenwetter, *Nanophyes transversus* (Aubé), *l. c.* taf. iii. fig. 1; *Cionus fraxini* (Deg.), taf. iv. fig. 4; and *Cionus gibbifrons* (Kiesenw.), *l. c.* taf. iv. fig. 5.

Dietrich describes the sexual characters presented by the species of *Rhynchites* and *Ceuthorhynchus*. Mittheil. Schweiz. entom. Gesellsch. 1864, pp. 271-274

Frauenfeld describes the occurrence of *Cossonus ferrugineus* with its larva in the walls of a large cavity in the stock of an apparently sound poplar. Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 380, 381.

Frauenfeld (Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 694-696) describes the habits and metamorphoses of *Lixus turbatus* (Gyll.), the larvæ of which are found in June in the hollow stems of *Cherophyllum bulbosum* (Lin.), and records the occurrence of an enlargement of the egg previous to hatching.

The metamorphoses of *Orchestes scutellaris* (Germ.) and *O. fugi* (Lin.) are described by Frauenfeld, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 684. The same author describes the development of *Tychius polylineatus* (Germ.) and *Apion varipes* (Germ.) from excrescences on *Trifolium pratense*, *l. c.* pp. 686, 687.

Brisout de Barneville describes the larva of *Erirhinus maculatus* (Marsh.) found in the catkins of *Salix caprea*. Bull. Soc. Ent. Fr. 1864, p. lix. According to Aubé, *l. c.* p. xvii, this larva belongs to *E. bimaculatus* (Fab.).

Hartig describes the ravages of *Dorytomus majalis* in catkins of various species of willow. Berl. ent. Zeits. 1864, p. 397.

Perris publishes some additions and corrections to his notes on the habits of the species of *Apion*. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 305.

New genera :—

Achradidius, Kiesenwetter, Berl. ent. Zeits. 1864, p. 247. Allied to *Brachyderes*, but resembling *Strophosomus* in habit; second and third joints of antennæ nearly equal. Sp. *A. creticus*, n. sp., tab. 3. f. 5.

Axyraus, Kiesenw. *l. c.* p. 257. Allied to *Mesagroicus* or *Dichotrachelus*; antennæ short and stout, scape passing posterior margin of eyes, first joint of funiculus obconical, the rest beaded; eyes small, round, convex; rostrum short, scrobes deep in front; prothorax large, rounded, convex; elytra scarcely wider than thorax, shoulders rounded; posterior coxæ distant; tibiae dilated at apex, fringed with spinules; claws free. Sp. *A. kraatzii*, n. sp., tab. 3. f. 4, from Crete.

Echinodera, Woll. Cat. Can. Col. p. 293. Nearly allied to *Acalles*; surface even, nearly uniformly setose; body posteriorly scarcely coarctate; eyes small or minute, oval; scutellum none; second joint of funiculus longer than first. Known species, *E. crenata* (Woll.).

Xenomierus, Woll. *l. c.* p. 331. Nearly allied to *Liosomus*; body sparsely pubescent; antennæ inserted at the gradually dilated apex of the rostrum, which is shorter and stouter than in *Liosomus*; eyes larger; prothorax cylindrical; scutellum conspicuous. Sp. *X. apionides*, sp. n., from Teneriffe.

Danaë, Vollenh. Tijdschr. voor Entomologie, vii. p. 166. Allied to *Pachyrhynchus*; rostrum longer than head, robust, slightly arched, dilated at the end, with a short furrow in front of each eye. Antennæ long, rather stout; scape clavate, not reaching posterior margin of eyes. Prothorax without

vibrissæ. Scutellum distinct. Elytra much wider than prothorax at base. Anterior coxæ contiguous. Sp. *D. lunulata*, Voll. (*l. c.* p. 166, pl. 12. fig. 2), from Marotai.

New species :—

Sitones subcostatus, Allard, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 340, from Algeria, Hungary, and Andalusia; *S. cinnamomeus* (Motsch. MS.), Allard, *l. c.* p. 365, from Saint Raphaël, Madrid, and the Caucasus; *S. biseriatus*, Allard, *l. c.* p. 374, from near Paris; *S. blanchardi*, Allard, *l. c.* p. 375, from Algeria; *S. ellipticus*, Allard, *l. c.* p. 380, from Algeria; *S. niger*, Allard, *l. c.* p. 381, from Algeria; *S. serpentarius* (Motsch., MS.), Allard, *l. c.* p. 381, from the Amur River.

Metallites modestus, Stierlin, Berl. ent. Zeits. 1864, p. 150, from Sicily; *M. pistaciæ*, Kiesenw. Berl. ent. Zeits. p. 249, from Athens.

Pachyrhynchus forsteni, Voll. *l. c.* p. 168, pl. 12. fig. 4, from Ternate; &c.; *P. morotaiensis*, Voll. *l. c.* p. 169, from Morotai.

Cucorhinus argentatus, Perris, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 295, from Spain (Escorial).

Polydrosus interstitialis, Perris, *l. c.* p. 296, from Madrid; *P. niveopictus*, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 248, from the Pyrenees.

Polydrosus virens, Kiesenw. Berl. ent. Zeits. p. 252, taf. 3. fig. 6=? *Eusomus angustus* (Luc.); *P. gracilicornis*, Kiesenw. *l. c.* p. 253, from Greece and Crete; *P. marcidus*, Kiesenw. *ibid.*, from Greece.

Orcheses albopilosus, Reiche, *l. c.* p. 248, from the South of France.

Foucartia chloris, Kiesenwetter, Berl. ent. Zeits. 1864, p. 244, from Athens.

Sciaphilus corpulentus, Kiesenw. *l. c.* p. 244, and *S. coccifera*, Kiesenw. *l. c.* p. 245, from Greece; *S. beckeri*, Stierlin, Bull. Soc. Nat. Mosc. 1863, p. 494, from Sarepta—allied to *S. hampei*.

Eupholus aurifer, Voll. *l. c.* p. 167, pl. 12. fig. 3, from Ceram; *E. vilis*, Voll. *l. c.* p. 168, from Sumatra.

Rhinoscapha batjanensis, Vollenh. Tijdschr. voor Entom. vii. p. 164, from Batchian; *R. dohrnii*, Voll. *l. c.* p. 165, pl. 12. fig. 1, from Morotai.

Herpysticus calvus, Woll. Cat. Can. Col. p. 372, and *H. oculatus*, Woll. *l. c.* p. 373, from the Canaries.

Thylacites obesulus, Woll. *l. c.* p. 379, from Lanzarote; *Brachyderes rugatus*, Woll. *l. c.* p. 379, and *B. sculpturatus*, Woll. *ibid.*, from the Canaries.

Omius indutus, Kiesenw. *l. c.* p. 259, from Crete.

Stomodes puncticollis, Tournier; Mitth. Schw. Ent. Ges. 1864, p. 268, from Sicily.

Peritelus kratzii, Tournier, Mitth. Schw. ent. Ges. 1864, p. 268, from Sicily.

Phyllobius pinicola, Kiesenw. *l. c.* p. 260, from Ætolia; *P. smaragdifer*, Kiesenw. *l. c.* p. 262=? *P. lateralis* (Reiche), from Ætolia; *P. crassicollis* (Motsch.), Stierlin, Bull. Soc. Nat. Mosc. 1863, p. 496, from Sarepta; *P. glycyrrhizæ* (Becker), Stierlin, Bull. Soc. Nat. Mosc. 1863, p. 495, from Sarepta—most nearly related to *P. uniformis* and *pomona*.

Atlantis (Canopus) subnebulosa, Woll. *l. c.* p. 337, and *A. (C.) tibialis*, Woll. *l. c.* p. 338, from the Canaries.

Laparocerus. Of this genus 22 new Canarian species are described by Wollaston: namely, *Laparocerus undatus*, l. c. p. 342; *L. grossepunctatus*, l. c. p. 344; *L. crassirostris*, l. c. p. 345; *L. scapularis*, l. c. p. 347; *L. æthiops*, ibid.; *L. hirtus*, l. c. p. 348; *L. globulipennis*, l. c. p. 349; *L. occidentalis*, l. c. p. 350; *L. obtriangularis*, l. c. p. 351; *L. lepidopterus*, l. c. p. 352; *L. seniculus*, l. c. p. 353; *L. rarus*, l. c. p. 354; *L. mendicus*, l. c. p. 355; *L. obscurus*, ibid.; *L. gracilis*, l. c. p. 356; *L. dispar*, l. c. p. 357; *L. vestitus*, l. c. p. 358; *L. sulcirostris*, l. c. p. 359; *L. compactus*, ibid.; *L. obsitus*, l. c. p. 361; *L. tenellus*, l. c. p. 362; and *L. puncticollis*, ibid.

Lichenophagus. Wollaston describes six new species from the Canaries: *L. auctus*, l. c. p. 363; *L. tesseraula*, p. 364; *L. persimilis*, p. 365; *L. subnodosus*, p. 366; *L. sculptipennis*, p. 367; and *L. impressicollis*, p. 368.

Episomus stellio, Voll. l. c. p. 169, pl. 12. fig. 5, from Sumatra.

Brachycerus opacus, Woll. l. c. p. 334, from Lanzarote.

Dichotrachelus graellsii, Perris, l. c. p. 297, from Spain.

Rhytidorhinus brevitarsis, Woll. l. c. p. 333, from the Canaries.

Magdalinus longicornis, Kiesenw. l. c. p. 26, taf. 4. fig. 2, from Ætolia.

Plinthus cucullus, Woll. l. c. p. 330, from Grand Canary.

Alophus magnificus, Woll. l. c. p. 326, from Teneriffe.

Hypera irrorata, Woll. l. c. p. 327, from the Canaries.

Hynoglyptus gracilis, Kiesenw. l. c. p. 274, taf. 4. fig. 16, from Ætolia.

Mecinus setosus, Kiesenw. l. c. p. 274, from Zante.

Smicronyx rufipes, Kiesenw. l. c. p. 276, from Zante. *S. pauperculus*, Woll. l. c. p. 317, from the Canaries.

Anthonomus australis, Philippi, l. c. p. 365, and *A. variabilis*, Phil. ibid., from Chili.

Procas cotti, Perris, l. c. p. 298, from Oran.

Tychius albilaterus and *astragali* (Becker), Stierlin, Bull. Soc. Nat. Mosc. 1863, pp. 497, 498. From Sarepta. Most nearly allied to *T. venustus*.

Tychius laticollis, Perris, l. c. p. 298, from Spain (Escorial); *T. græcus*, Kiesenw. l. c. p. 279, from Patras; *T. (Miccotrogus) consputus*, Kiesenw. l. c. p. 280, from Crete, &c.; *T. bicolor*, Stierlin, Berl. ent. Zeits. p. 151, from Sicily; *T. aridicola*, Woll. l. c. p. 302, and *T. depauperatus*, Woll. l. c. p. 303, from the Canaries.

Sibynes sericeus, Woll. l. c. p. 301, from the Canaries.

Cleonus armitagii, Woll. l. c. p. 321, and *C. variolosus*, l. c. p. 323, from the Canaries.

Larinus longirostris, Stierlin, Berl. ent. Zeits. p. 150, from Sicily.

Cionus (Stereonychus) globulariæ, Kiesenw. l. c. p. 283, tab. iv. fig. 3, from Athens; *C. telonensis*, Grenier, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 133, from Toulon.

Raymondia perrisii, Grenier, l. c. p. 134, from Toulouse; a blind species.

Nanophyes. Aubé describes three new French species of this genus: namely, *Nanophyes circumscriptus*, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 326; *N. geniculatus*, l. c. p. 327; and *N. rubens*, ibid.

Nanophyes globiformis, Kiesenw. l. c. p. 284, taf. iii. fig. 2, from Nauplia;

N. geniculatus, Kiesenw. l. c. p. 285, from Crete; *N. sexpunctatus*, Kiesenw. l. c. p. 286, tab. iii. fig. 3, from Crete; *N. longulus*, Woll. l. c. p. 299, from the Canaries.

Nanophies (sic) *aureolus*, Perris, l. c. p. 299, from Corsica.

Acalles. Wollaston describes 11 new Canarian species of this genus: *Acalles æonii* (Chevr. MS.) l. c. p. 285; *A. fortunatus*, l. c. p. 286; *A. xerampelinus*, l. c. p. 287; *A. nubilosus*, ibid.; *A. sigma*, l. c. p. 288; *A. senilis*, ibid.; *A. brevitarsis*, l. c. p. 289; *A. acutus*, ibid.; *A. instabilis*, l. c. p. 290; *A. seticollis*, l. c. p. 291; and *A. pilula*, l. c. p. 292.

Psilorrhinus (sic). Four Chilian species are described by Philippi: *Psilorrhinus tuberculosus*, l. c. p. 366; *P. valdivianus*, l. c. p. 367; *P. elegans*, ibid.; *P. rufulus*, l. c. p. 368.

Lamosaccus castaneus, Philippi, l. c. p. 369, from Chili.

Lophocephala bioculata, Philippi, l. c. p. 370, from Chili.

Cnemeccælus. Three new Chilian species are described by Philippi: *Cnemeccælus brevis*, l. c. p. 371; *C. valdivianus*, ibid.; *C. valparadisiacus*, l. c. p. 372.

Echinodera (n. g.). The following new Canarian species are described by Wollaston: *Echinodera hystrix*, l. c. p. 294; *E. angulipennis*, l. c. p. 296; *E. orbiculata*, l. c. p. 297; *E. compacta*, ibid.; and *E. picta*, l. c. p. 298.

Baridius pertusus, Kiesenw. l. c. p. 291, and *B. eribellatus*, Kiesenw. l. c. p. 292, from Athens; *B. flavipes*, Philippi, l. c. p. 369, from Chili.

Rhyssomatus ater, Philippi, l. c. p. 372, from Chili.

Centrinus thoracicus, Philippi, l. c. p. 369, and *C. carinatus*, Phil. l. c. p. 370, from Chili.

Stenorrhynchus quadrinotatus, Philippi, l. c. p. 360, from Chili.

Stenocerus posticalis, Philippi, l. c. p. 361, and *S. lineola*, Phil. l. c. p. 362, from Chili.

Cathormiocerus pfisteri, Stierlin, l. c. p. 150, from Sicily.

Ceuthorhynchus phytobioides, Woll. Cat. Can. Col. p. 281, from Teneriffe; and *C. hesperus*, Woll. l. c. p. 282, from Hierro.

Ceuthorhynchideus poweri, Rye, Ent. M. Mag. vol. i. p. 137. British.

Cossonus canus, Philippi, l. c. p. 372, *C. nitidus*, Phil. l. c. p. 373, and *C. nigropiceus*, Phil. ibid., from Chili.

Culandri chilensis, Phil. l. c. p. 374, and *C. lexicosta*, Phil. ibid., from Chili.

Orycorynus minutus, Phil. l. c. p. 365, from Chili.

Apion. The following new species are described by Wencker (L'Abeille, tom. i.): *Apion poupillieri*, l. c. p. 127, from Algeria; *A. barnevillii*, l. c. p. 133, France; *A. candidum*, l. c. p. 142, S. of France; *A. annulipes* (= *mil-lum*, Bach?), l. c. p. 145, from Rhenish Prussia and Cherbourg; *A. cineræum*, l. c. p. 146, France; *A. venustum*, l. c. p. 148, from Greece; *A. rufulum*, l. c. p. 162, France; *A. hydropticum*, l. c. p. 174, France; *A. rapulum*, l. c. p. 175, France; *A. subnubescens*, l. c. p. 176, from Algeria; *A. seriato-setulosum*, l. c. p. 179, from Nice and Andalusia; *A. setosum*, l. c. p. 180, from Caramania; *A. leucophaeatum*, l. c. p. 183, from Fréjus; *A. litigiosum*, l. c. p. 189, from Turkey; *A. armiferum*, l. c. p. 190, from Turkey; *A. tubicen*, l. c. p. 200, from S. Europe; *A. leprieuri*, l. c. p. 214, from Algeria; *A. melancholicum*, l. c. p. 217, France; *A. perspicax*, l. c. p. 221, from Germany; *A. filicorne*, l. c.

p. 235, France and Italy; *A. lunuginosum*, l. c. p. 236, France; *A. decorum*, l. c. p. 238, S. of France; *A. fairm. ei*, l. c. p. 241, from Tangier; *A. ceneomicans*, l. c. p. 242, and *A. fallax*, *ibid.*, from France; *A. marseuli*, l. c. 261, from Algeria.

Wollaston describes *Apion senex*, l. c. p. 306; *A. calcaratum*, l. c. p. 310; *A. westwoodii*, l. c. p. 311; *A. austrinum*, l. c. p. 312; *A. fallax*, l. c. p. 313; *A. ceuthorhynchoides*, l. c. p. 314; *A. umbrinum*, l. c. p. 315; and *A. longipes*, *ibid.*; from the Canaries.

Philippi describes six Chilean species of this genus, including *A. obscurum* (Blanch.) and new species: *Apion pachymerum*, *A. meorrhynchum*, *A. humerale*, *A. vestitum*, and *A. angustatum*, l. c. p. 364. *A. glabratum*, Kiesenw. l. c. p. 289, from Athens.

Apoderus. Snellen van Vollenhoven describes the following new species of this genus from different islands of the Eastern Archipelago (Tijdschr. voor de Dierkunde, 1864): *Apoderus spectrum*, l. c. p. 159 (cum fig.), from Sumatra; *A. (Cycnotrachelus) olor*, l. c. p. 161, from Java; *A. (Cycn.) anser*, l. c. p. 162, from Timor; *A. (Cycn.?) palliatus*, l. c. p. 162, from Sumatra; *A. quadrillum*, l. c. p. 163, from Java; *A. pardalis*, l. c. p. 164, from Japan; *A. erythrogaster*, l. c. p. 165, from Japan; and *A. niger*, l. c. p. 166, from Celebes.

Rhynchites semiruber, Stierlin, Bull. Soc. Nat. Mosc. 1860, p. 492, from Sarepta. Intermediate between *R. equatus* and *ruber* (Fairm.). *Rhynchites rufescens*, Philippi, l. c. p. 363, and *R. seniculus*, Phil. *ibid.*, from Chili.

Auletes. Of this genus three new Canarian species are described by Wollaston: *Auletes cylindricollis*, l. c. p. 304; *A. anceps*, l. c. p. 305; and *A. convexifrons*, *ibid.*

BRUCHIDÆ.

Dietrich describes the distinctive characters of the sexes in the genus *Bruchus*, Mitth. Schw. ent. Ges. 1864, pp. 261-271.

Cercomorphus, g. n., Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 293. Allied to *Urodon*. Body flat beneath; rostrum very short, broad; antennæ inserted beneath the frontal margin in front of the eyes, slender, shorter than head, 9-jointed. Sp. *Cercomorphus duvallii*, Perris, l. c. p. 295, from Aranjuez.

Bruchus. Seven new Chilean species of this genus are described by Philippi, Stett. ent. Zeit. 1864: *Bruchus pauperculus*, l. c. p. 358; *B. egenus*, *ibid.*; *B. scutellaris*, *ibid.*; *B. bicolor*, l. c. p. 359; *B. pyrrhomelas*, *ibid.*; *B. rufulus*, l. c. p. 360; *B. obscurus*, *ibid.*

Wollaston describes three new Canarian species: *Bruchus terminatus*, l. c. p. 381; *B. floricola*, l. c. p. 383; and *B. antennatus*, *ibid.*

(AGLYCYDERIDÆ.)

Wollaston (Cat. Can. Col. p. 384) proposes the formation of a separate family for the genus *Aglycyderes* (Westw.), which he says in some of its characters closely approaches the *Anthrribides*, whilst in other respects it shows an affinity to *Hylastes* and other Bostrichide genera. He considers the family to unite these groups with certain forms of *Colydiide*.

BOSTRICHIDÆ.

EICHHOFF has published (Berl. entom. Zeitschr. 1864, pp. 17-46) an elaborate investigation of the structure of the buccal

organs and antennæ in the European genera of this family, of which he admits and characterizes 21, as shown in the following Table :—

A. Maxillary lobes gradually narrowed in front, rounded at the tip; maxillary palpi conical; labrum wanting; tarsi shorter than tibiæ.

I. Third tarsal joint cordate or bilobed.

* All the tibiæ beset externally with spines; abdomen not rising to the apex.

a. Club of antennæ globular or shortly ovate.

α. Funiculus with seven joints 1. *Hylastes* (Erichs.).

β. Funiculus with six joints.

1. Labium and third tarsal joint cordate; antennal club globular.

2. *Hylurgus* (Lat.).

2. Labium oval; third tarsal joint bilobed; antennal club ovate 3. *Blastophagus*, n. g.

γ. Funiculus with five joints.

1. First tarsal joint as long as second and third together; first joint of labial palpi much longer than second and third together; mentum horny..... 4. *Dendroctonus* (Erichs.).

2. First tarsal joint very short; first and second joints of labial palpi nearly equal; mentum membranaceous.

5. *Carphoborus* (n. g.).

b. Club of antennæ elongate-ovate.

α. Funiculus 5-jointed; club of three distinct joints.

1. Club-joints scarcely broader than long.

6. *Phlæophthorus* (Woll.).

2. Club-joints dilated into lateral lamellæ.

7. *Phlæotribus* (Lat.).

β. Funiculus 7-jointed; club annulated 8. *Hylesinus* (Fab.).

† Anterior tibiæ entire; belly ascending steeply to the apex.

9. *Scolytus* (Geoff.).

II. Third tarsal joint simple.

* Eyes divided.

a. Funiculus 5-jointed 10. *Polygraphus* (Erichs.).

b. Funiculus 4-jointed 15. *Xyloterus* (Erichs.).

† Eyes simple, more or less reniform.

a. Club of antennæ solid; funiculus 2-jointed.

11. *Crypturgus* (Erichs.).

b. Club annulated.

α. Funiculus 3-jointed (Redt.) 12. *Hypothenemus* (Westw.).

β. Funiculus 4-jointed 13. *Cryphalus* (Erichs.).

γ. Funiculus 5-jointed.

1. Third tarsal joint longer than preceding ones.

14. *Hypoborus* (Erichs.).

2. Third tarsal joint equal to the preceding.

a. Maxillary lobes with 30-40 sickle-shaped bristles; first joint of labial palpi very large, inflated. 16. *Xyleborus*, g. n.

b. Maxillary lobes with not more than fifteen, nearly straight spines.

* Ligula narrow; labium narrowest at base.

† First joint of labial palpi larger than second; club longer than funiculus.

O. Labium broadly cordate, scarcely longer than broad.

17. *Dryocætes*, g. n.

OO. Labium triangular, nearly three times as long as broad.

18. *Pityophthorus*, g. n.

†† Second joint of labial palpi largest; club shorter than funiculus 19. *Thamnurgus*, g. n.

** Ligula almost broader than labium; labium narrowest in the middle 20. *Bostrichus* (Fab.).

B. Maxillary lobes linearly elongate, truncate in front; maxillary palpi geniculate; labrum distinct; first tarsal joint longer than tibia.

21. *Platypus* (Herbst).

FAIRMAIRE (Genera Col. Europe) divides this family (*Scolytides*, Fairm.) into four groups, viz. *Hylesinites*, *Scolytides*, *Bostrichites*, and *Platypites*.

His classification is identical with that proposed by Eichhoff, except that he places *Polygraphus* in the first group, notwithstanding its simple third tarsal joint. In a note Fairmaire refers to Eichhoff's memoir, cites his new genera, and confirms his statement that the maxillary palpi in these insects consists only of three joints, except, perhaps, in *Platypus*.

Eichhoff states that *Bostrichus coryli* (Perr.) belongs to *Dryocætes* and not to *Thamnurgus*. Berl. ent. Zeits. 1864, p. 401.

Wahnschaffe describes the habits of *Bostrichus bispinus* (Ratzeb.). Berl. ent. Zeits. 1864, p. 396.

Hylastes tenebrosus (Sahlb.) is probably identical with *H. cunicularius* (Erichs.), and *Dendroctonus juniperi* (Nördl. Dübner) with *Hylesinus thuyæ* (Perris). Kraatz, Berl. ent. Zeitschr. 1864, p. 140.

The following known species are figured by Fairmaire, Genera des Coléoptères d'Europe: *Hylaster ater* (Payk.), pl. 31. fig. 148; *Hylurgus pini-perda* (Fab.), fig. 149; *Dendroctonus micans* (Kug.), fig. 150; *Hylesinus cre-natus* (Fab.), fig. 151; *H. oleiperda* (Fab.), fig. 152; *Phlæophthorus tarsalis* Först.), pl. 32. fig. 153; *Phlæotribus oleæ* (Fab.), fig. 154; *Polygraphus pubescens* (Fab.), fig. 155; *Scolytus destructor* (Oliv.), figs. 156 & 157; *Crypturgus lichtensteinii* (Ratz.), pl. 33. fig. 158; *Cryphalus fagi* (Ratz.), fig. 159; *Trypophlæus* (g. n.) *binodulus* (Ratz.), fig. 160; *Xyloterus domesticus* (Linn.), fig. 162; *Hypoborus ficus* (Erichs.), pl. 34. fig. 163; *Bostrichus eurygraphus* (Erichs.), fig. 164; *B. dispar* (Fab.), figs. 165 & 166; and *Platypus oxyurus* (Duf.), fig. 167.

New genera:—

Eichhoff (Berl. entom. Zeitschr. 1864) characterizes the following new genera of this family:—

Blastophagus, Eichh. l. c. p. 25, taf. 1. fig. 4. Allied to *Hylurgus*; third tarsal joint bilobed; funiculus 6-jointed, joints nearly equal in width towards the club, club oblong-ovate, annulate; fulcrum of ligula oval. Sp. *B. pini-perda* (Linn.); *B. minor* (Hart.); and probably *B. hederæ* (Schmidt).

Carphoborus, Eichh. *l. c.* p. 27, taf. 1. fig. 8. Allied to *Dendroctonus*; first tarsal joint minute, second larger, third cordate; funiculus 5-jointed, club oval, annulated; first joint of labial palpi subquadrate, scarcely longer than second. Sp. *C. minimus* (Fab.), and *C. pilosus* (Ratzeb.).

Xyleborus, Eichh. *l. c.* p. 37, taf. 1. figs. 13-17. Allied to *Bostrichus*; first three joints of tarsi nearly equal, simple; funiculus 5-jointed, club subglobose, subannulate; ligula narrow; labial palpi with the first joint very large and inflated; maxillæ densely ciliated with falcate hairs; last joint of palpi longer than preceding. Sp. *X. dispar* (Fab.); *X. monographus* (Fab.); *X. dryographus* (Erichs.); *X. saxeseni* (Ratz.); *X. eurygraphus* (Ratz.); and *X. pfeili* (Ratz.).

Dryocates, Eichh. *l. c.* p. 38, taf. 1. figs. 18 & 19. Allied to *Bostrichus*; as preceding; ligula suboval; maxillæ ciliated with rigid spinules. Sp. *D. autographus* (Ratz.); *D. cryptographus* (Ratz.); *D. dactyliperda* (Fab.); *D. villosus* (Fab.); *D. alni* (Georg); and *D. bicolor* (Hbst.).

Pityophthorus, Eichh. *l. c.* p. 39, taf. 1. figs. 20 & 21. Allied to *Bostrichus*; ligula subacuminate; maxillæ armed with rigid spinules. Sp. *P. lichtensteini* (Ratz.); *P. micrographus* (Gyll.); and *P. exsculptus* (Ratz.).

Triotemnus, g. n., Woll. Cat. Can. Col. p. 264. Allied to *Aphanarthrum*; funiculus distinctly 3-jointed, second and third joints small, equal, club very solid, compressed; elytra subretuse at apex; colour dusky. Sp. *T. subretusus*, Woll. *l. c.* p. 265, from Gomera.

Trypophleus, g. n., Fairmaire, *l. c.* p. 105. Allied to *Bostrichus*; third tarsal joint a little longer than second; antennal club oblong, acuminate, slightly sinuated at the margins. Sp. *T. binodulus* (Ratz.).

New species:—

Hylesinus retamae, Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 300, from near Madrid; *H. indigenus*, Woll. *l. c.* p. 267, from Hierro; *H. bicolor*, Philippi, Stett. ent. Zeit. p. 375, from Chili.

Xyloterus quercus, sp. n., Cornelius, Verhand. naturh. Ver. preuss. Rheinl. und Westph. 1864, p. 61 (Corresp.). *Cylindricus*, brevior, niger, antennis pedibus prothorace ex parte elytrisque testaceis, his sutura, margine exteriore vittaque media abbreviata nigris, thorace transversim rugoso, elytris punctato-striatis, punctis subdilatis interstitiis inde transversim rugulosis, antennarum clava magna, apice intus subangulata. Long. $1\frac{1}{4}$ lin.

Xyloterus quercus, Eichhoff, Berl. ent. Zeit. 1864, p. 381, Germany; *X. longicollis*, Woll. *l. c.* p. 256, from Fuerteventura.

Aphanarthrum concolor, Woll. *l. c.* p. 263, from the Canaries.

Xylopertha barbifrons, Woll. *l. c.* p. 252, from Palma.

Bostrichus sulcicollis, Philippi, Stett. ent. Zeit. 1864, p. 375, from Chili.

Cyphagogus odevahnii, Westw. Proc. Ent. Soc. Lond. 1864, p. 46, from S. Australia.

LONGICORNIA.

General remarks on the family:—

Under the title of "Longicornia Malayana" PASCOE has commenced a descriptive catalogue of the Longicorn Beetles col-

lected by Wallace in the Eastern Archipelago, which is intended to occupy the whole of the third volume of the 'Transactions of the Entomological Society of London.' The first part appeared in September 1864. He calculates the number of species at nearly a thousand, of which fully 800 are probably undescribed. The results of these investigations as regards the geographical distribution of these insects will form the subject of a concluding summary by Wallace; but in his introduction Pascoe dissents from the views held by Wallace as regards the zoological geography of the Malayan archipelago, at least as far as the Longicornia are concerned. Wallace holds that the western islands of the archipelago belong to the Indian and the eastern islands to the Australian region, "the Asiatic and Australian regions finding in Borneo and New Guinea respectively their highest development." Pascoe states (*l. c.* p. 2) that he has not been struck by any special differences in the *Longicornia* between the eastern and western parts of the archipelago. On the contrary, there is a complete dissimilarity between the Australian Longicorns and those of the Eastern archipelago, including New Guinea. In illustration of this statement he gives a table of ten of the largest genera in Wallace's collections, showing the number of Malayan and Australian species:—

	Malayan.	Australian.	Remarks.
<i>Sybra</i>	23	1	
<i>Astathes</i>	26	0	
<i>Callichroma</i> . . .	29	1	Taken only once.
<i>Monochamus</i> . . .	45	5	{ 1 widely distributed, 1 doubtful.
<i>Oberea</i>	47	0	
<i>Tmesisternus</i> . . .	52	0	
<i>Ropica</i>	54	2	
<i>Praonetha</i>	56	1	
<i>Clytus</i>	77	6	1 doubtful.
<i>Glenea</i>	108	0	

As regards the classification of the Longicornia, Pascoe follows Leconte in dividing them into three families, namely, Lamiidæ, Cerambycidæ, and Prionidæ, which are again divided into numerous subfamilies (*vide infra*). Pascoe has also some remarks upon the complicated divisions introduced into the classification of insects, and upon the uncertainty of the value to be attached to groups having the same names in the writings of different authors. The discrepancy of which he complains is the result of the difference which must exist between the views of individual writers, and could only be got rid of by the adop-

tion of a canon of zoological classification, from which no author should be at liberty to depart. But there is another difficulty which threatens to overwhelm entomologists especially, namely, the excessive multiplication of genera, an evil which is now attaining such a magnitude as to render the study even of a limited group of insects a matter of the greatest labour and difficulty. This arises evidently from an undue prevalence of the analytical mode of study. Entomologists are constantly looking out for differences in the objects of their investigation; every species that does not readily fall into an established genus is made the type of a new one, and as the notion of enlarging the boundaries of a genus established upon insufficient materials appears to be repugnant to the minds of entomologists, the evil must necessarily go on increasing. The greater part of the genera characterized by Pascoe in the work before us are marked as new; in many cases they contain only one species, and the author's remarks are sufficient to show the very slight characters upon which they are separated.

SCHJÖDTE, in his paper "On the Classification of Cerambyces" (Naturhist. Tidsskr. ser. 3. vol. ii.), remarks on the different modes of ambulatory progression adopted by Arthropod animals in general, and Insects in particular, and on the organs which assist in this action. Nearly all Insects are *plantigrade*, and those of them possess foot-pads "whose mode of life requires that they should move on highly inclined dry surfaces;" these foot-pads consist of an immense number of hairs, forming a nearly smooth surface as soft as velvet. The action of the foot-pads is assisted by the *spurs* and *claws*. The functions of these are explained by Schjødte, who indicates that in some cases the claws would be in the way, and shows that, in the so-called Tetramerous Beetles especially, the contrivance for raising the claw-joint, so as to prevent its impeding the motions of the insect, consists mainly in the reduction of the true penultimate joint to the form of small nodule at the base of the claw-joint. This character, the possession of Tetramerous or pseudopentamerous tarsi, is therefore regarded by the author as not of the importance usually ascribed to it, being, as he says, not *typical* but *biological*, or dependent on mode of life; and this applies to the family-characters of the groups *Cerambyces*, *Curculiones*, and *Chrysomelæ*.

Schjødte further remarks upon the contrast between the methods of Latreille and Fabricius in entomology, and expresses his belief in the correctness of the Fabrician principle of founding systematic groups on the characters presented by the organs of the mouth, as it is upon the structure of these that the entire conformation of the insect is dependent. In the *Cerambyces* he indicates three types of buccal structure, readily recognized by

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the condition of the stipites of the labial palpi, "which are either free and moveable by themselves, or have coalesced with the lingua and thus lost their independent movements, or, finally, have coalesced with each other longitudinally, but not with the lingua, so as to be moveable, but only in unison with each other." The characters of these types are fully discussed by the author, and their connexion with the mode of life of the animals is pointed out. Schjödte calls attention to the minute pores or cavities, each with a very short pellucid hair at the bottom, which occur all over the surface, or in certain circumscribed spots on the antennæ of the Cerambycidæ, and to the arrangement of which he ascribes considerable systematic importance. He gives the name of "flying hairs" (*pili volatiles*) to the long, soft hairs which project from the body, limbs, and antennæ of many Cerambycidæ, and which he regards as aiding flight by giving a larger surface to the insect, without materially increasing its weight. The author also describes the anatomical structure of the Cerambycidæ.

Schjödte makes the following observations upon the systematic position of certain exotic genera:—

Tropidosoma, *Tragocerus*, *Pæcilocephus*, *Ceroctenus*, and *Dorcasomus* belong to Cerambycini; *Spondylis* belongs to Prionini instead of forming a distinct group; *Rosalia* belongs to the Callidini; *Tetropium*, *Aseum*, and *Criocephalum* form a new group, *Asemini*, approaching Prionini; the *Hesperophani*, *Clyti*, *Obrii*, and *Gracilini* belong to Cerambycini; the group *Necydalini* must be dissolved, *Necydalis* being united with *Lepturini*, and *Molorchus* with Cerambycini; *Stenopterus* is closely allied to Callidini; the *Lamini* close the family, being most nearly related to the Chrysomelidæ; *Vesperus* forms a peculiar group between *Asemini* and *Prionini*, differing from the latter only in the structure of its antennæ; and *Rhamnusium* belongs to Callidini.

The characters derived from the abbreviation and narrowing of the elytra are regarded by Schjödte as of little systematic value, and, indeed, as having by their adoption done more mischief than any others. The following table shows the author's classification as applied to the Danish forms of this family:—

TYPE I. Stipites palporum labialium fixi, basi concreti, linguæ adnati.

PRIONINI:—*Spondylis*, *Prionus*.

VESPERINI:—No Danish species.

ASEMINI:—*Tetropium*, *Criocephalum*, *Aseum*.

TYPE II. Stipites palporum labialium mobiles, discreti, in fulcrum labii retractiles.

CERAMBYCINI:—*Cerambyx*, *Callichroma*, *Clytus*, *Gracilia*, *Molorchus*, *Callidium*, *Rhamnusium*.

LEPTURINI:—*Rhagium*, *Toxotus*, *Pachyta*, *Leptura*, *Necydalis*.

LAMINI:—*Astynomus*, *Liopus*, *Acanthoderes*, *Exocentrus*, *Pogonocherus*, *Lamia*, *Monochamus*, *Lepargus*, *Mesosa*, *Agapanthia*, *Saperda*, *Tetrops*, *Stenostola*, *Oberea*, *Phytæcia*.

The primary classification of the Longicornia (*Cerambycidae*, Thoms.) proposed by THOMSON ('Systema Cerambycidarum') is as follows:—

Legion I. METAULACNEMITÆ.

Anterior tibiæ obliquely sulcate within towards the apex.

Tribe I. *Lamitæ*. Prothorax usually not margined at the sides, apparently composed of two pieces; eyes lunulate; palpi filiform; anterior coxæ globose.

Legion II. ANAULACNEMITÆ.

Anterior tibiæ not sulcate within.

Tribe 2. *Lepturitæ*. Prothorax as in *Lamitæ*; eyes subrotundate or lunulate; palpi usually compressed; anterior coxæ conical.

Tribe 3. *Cerambycitæ*. Prothorax, &c., as in preceding; anterior coxæ globose.

Tribe 4. *Spondylitæ*. Prothorax, &c., as in preceding; anterior coxæ subtransverse.

Tribe 5. *Prionitæ*. Prothorax margined at the sides, apparently composed of four pieces; eyes lunulate; anterior coxæ very transverse.

As the author adopts an immense series of groups inferior to the tribes, amounting in many cases to four or even five grades subordinate one to the other, and the number of new genera established is enormous, it would be impossible, without transferring the greater part of the contents of his work to our pages, to give any idea of the characters by which these groups are distinguished. However, M. Thomson's work is quite indispensable to every one who studies this family or part of it, and we could not supply anything like an abstract really useful to the student*. The new genera and species will be referred to hereafter.

LÉON FAIRMAIRE (Genera des Coléoptères d'Europe), in his classification of the *Cerambycidae*, likewise creates a great number of subordinate groups. His

Division I. includes only the Group *Spondylites*.

Division II. (= *Prionitæ*, Thoms.) includes *Prionites*, *Ergatites*, *Tragosomites*, and *Egosomites*.

Division III. (= *Cerambycitæ*, Thoms.) includes *Asémities*, *Anisarthrites*, *Criocéphalites*, *Saphanites*, *Clytites*, *Hespérophanites*, *Callidiutes*, *Rosalutes*, *Cerambycites*, *Graciliutes*, *Leptidéites*, *Sténoptérites*, and *Deilites*.

Division IV. (= *Lamitæ*, Thoms.) includes *Ædilites*, *Exocentrutes*, *Acanthodérutes*, *Pogonochérutes*, *Monohanmites*, *Lamiutes*, *Dorcadionites*, *Mésosites*,

* The Recorder's manuscript contained a detailed analytical table of M. Thomson's classification, and we regret very much that want of space absolutely prevents us from publishing it this year. In this course we may be to a certain extent justified by the circumstance that the author will probably make many additions to the genera, &c., before he has completed his tables of classification.—EDITOR.

Anæsthètes, *Agapanthètes*, *Saperdites*, *Phytæciites*, and is not completed in the last livraison which the Recorder has had the opportunity of seeing.

THOMSON (Syst. Ceramb. pp. 310-321) refers to certain forms of Beetles which have usually been placed with the Longicornus, although their title to such a position appears, in some respects, problematical. Of these the genera *Thaumasus*, *Erichsonia*, and *Parandra* have the strongest Cerambycidan affinities, and may, without much violence, be regarded as aberrant members of that family; but the others, namely *Trictenotoma*, *Anoploderma*, and *Hypocephalus*, with their allies, present greater difficulties, and depart so widely from the type of the true Cerambycidae, that M. Thomson is perhaps justified in founding distinct families for their reception. He gives the following table of the distinctive characters of these six groups:—

(Tarsi tetrameri, artic. 3^{us} *bilobatus vel profunde lunatus*.

Cerambycidae).

I. Tarsi tetrameri, artic. 3^{us} *simpliciter lunatus*.

* Prothorax later. immarginatus; coxæ anticæ subtransversæ; palpi breves; corpus elongatum, cylindricum; ant. breviss.; mand. parvæ; max. valde bilobatæ; abd. elongatum; tibiæ fere cylindricæ; tarsi vix scopigeri. *Thaumasidæ*.

† Prothorax later. marginatus; coxæ anticæ transversæ.

a. Palpi breves; caput 4-carinatum; ant. breves; mand. parvæ; max. unilobatæ; abd. subelongatum; tibiæ apice dilatatæ; tarsi vix scopigeri. *Erichsonidæ*.

b. Palpi elongati; corpus depressum, parallelum; ant. breves; ♂ mand. magnæ horizontales; max. unilobatæ; abd. breve; tibiæ apice dilatatæ; tarsi fere scopigeri *Parandridæ*.

II. Tarsi vel *heteromeri*, vel *tetrameri*, vel *pentameri*, art. 3^{us} *subinteger vel integer*.

* Corpus subdepressum; ant. art. 1^o elongatus, art. 9^o, 10^o, et 11^o apice valde dentatis; ♂ mand. magnæ, horizontales; max. valde bilobatæ; abd. subelongatum; tibiæ cylindricæ; tarsi *heteromeri*, fere scopigeri, artic. 3^{us} *integer* *Trictenotomidæ*.

† Corpus convexum; ant. breves, extus serratæ; mand. subverticales; max. unilobatæ; tibiæ dilatatæ; tarsi *tetrameri*, vix scopigeri, art. 3^{us} *subinteger* *Anoplodermidæ*.

‡ Corpus convexum; ant. breves, moniliformes; mand. magnæ subtus ductæ; max. fere unilobatæ; prothorax maximus; abd. breve; pedes postici robustissimi, dilatati; tibiæ dilatatæ extus dentatæ; tarsi *pentameri*, nec scopigeri, art. 3^{us} *interger* *Hypocephalidæ*.

Notes on known genera and species:—

PASCOE (Journ. of Entom. ii. p. 245) has some remarks upon the genera which have been formed by the dismemberment of the old genus *Clytus*, with especial reference to the Australian species. He seems to think that these genera are rather inde-

finitely characterized, and, as far as the Australian forms are concerned, proposes the adoption only of *Arideus* (Thoms.) and *Demonax* (Thoms.), and the establishment of a new generic group (p. 246), *Cremys*, for *Clytus diophthalmus* (Pasc.). It differs from *Arideus* "in the absence of spines on the antennæ and the non-clavate femora." *Anthoboscus alphabeticus* (Chevr.), according to Pascoe (l. c. p. 245, note), is the same as *Clytus notabilis* (Pasc.).

According to Heyden (Berl. ent. Zeits. 1864, p. 326), *Rhopalopus hungaricus* (Fab.) and *R. insubricus* (Germ.) are identical. The same author states (l. c. p. 327) that *Callidium glabratum* (Charp.) = *deltitii* (Chevr.) = *castaneum* (Redt.); *C. simile* (Küst.) = var. *variable*.

Heyden (l. c. p. 327) regards *Morinus verecundus* (Fald.) as identical with *lugubris* (Fab.).

Bates (Ann. & Mag. Nat. Hist. 3rd series, vol. xiii.) remarks on the characters of the genera *Cedopexa* (Serv.) l. c. p. 145, *Cosmotoma* (Dej., Blanch.) = *Beltista* (Thoms.) l. c. p. 147, *Cobelura* (Erichs.) op. cit. vol. xiv. p. 19, *Eutrypanus* (Dej.) l. c. p. 21, and on the characters and distribution of *Cedopexa pogonocheroides* (Serv.) and *Eutrypanus nitidus* (White) = *E. venezuelensis* (Thoms.).

Heyden remarks (Berl. ent. Zeits. 1864, p. 329 et seq.) that, from the short character given by Linné, his *Molorchus major* is probably identical with *M. salicis* (Muls.), to which he also refers *M. abbreviatus* (Fab.). *M. abbreviatus* (Panz.) is a distinct species = *M. major* (Guér., Muls.). Heyden describes the characters of the two species, and figures the apex of the abdomen, which furnishes distinctive marks (taf. 4. figs. 6 & 7). A detailed synonymy of the two species is given.

Chevolat objects to the union of *Prinobius scutellaris* (Germ.) and *P. atropos* (Chevr.) with *P. myardi* (Muls.), but admits that *P. gaubili* (Chevr.) may be identical with the latter species. Bull. Soc. Ent. Fr. 1864, p. xvii.

Lallemand describes the habits of *Prinobius lethifer* (Fairm.), of which he has sent living specimens to Paris. The eggs are laid three or four days after copulation, in Ash-trees, in the wood of which the larvæ reside. The males are eight or ten times as numerous as the females, and begin to make their appearance before the females; they fight with great ferocity, biting off each other's limbs. Bull. Soc. Ent. Fr. 1864, p. xxx.

Kraatz regards *Callidium macropus* (Germ.) as identical with *C. macropus* (Ziegl.), which is not a small form of *C. clavipes*, but a variety of *C. femoratum* (Linn.). According to the same author, *Callidium cupripenne* (Kriechb.) is a red-thighed variety of *C. coriaceum*. Berl. entom. Zeitschr. 1864, p. 140.

According to Kraatz, *Strangalia quinquesignata* (Küster) and *S. suturata* (Reiche) are both varieties of *S. 7-signata*; he describes the mode of variation of this species: l. c. p. 141.

Pachyta erythra (Küster) is a variety of *P. sex-maculata* (Linn.), according to Kraatz, l. c. p. 141, as is also *P. 7-signata* (Küster), l. c. p. 142.

Fairmaire regards *Eriosoma* (Blanch.) as identical with *Xylocharis* (Serv.).

Acanthocinus humeralis (Perty) is referred to *Probatius* (Dej., Thoms.) by Bates, Ann. & Mag. Nat. Hist. vol. xiii. p. 48.

Pascoe (Journ. of Ent. ii. p. 278, note) proposes to change the name of Thomson's genus *Leprosoma* into *Lepromoris*, the former name having been previously employed for an Hemipterous genus.

The same author (*l. c.* p. 287) proposes *Nothopcus* as a substitute for Serville's generic name *Colobus*, long previously employed for a genus of monkeys.

Kraatz maintains, in opposition to Lederer, that *Clytus heydeni* (Stierl.) is a mere variety, probably a morbid one, of *C. arvicola*. Berl. ent. Zeits. 1864, p. 390.

Michow records the occurrence near Berlin of a specimen of *Criocephalus*, agreeing in all respects, except colour, with *C. ferus* (Kraatz) from S. Europe and Corsica. Berl. ent. Zeits. 1864, p. 395.

Mors describes the typical form and three varieties of *Clytus arcuatus* (Linn.) and figures one variety, to which he gives the name of *colbeaui*. Ann. Soc. Ent. Belg. tom. vii. p. 131, pl. 3. fig. 9.

Stierlin describes *Strangalia armata*, var. *nigricornis*, with the antennæ and hind legs black, and two colour-varieties of *Leptura hastata* from Sicily. Berl. ent. Zeitschr. 1864, p. 153.

Hartig mentions the exclusion of imagos of *Gracilia pygmæa* from oak-sticks which had been enclosed for four years in glass cases as supports for stuffed animals. Berl. ent. Zeits. 1864, p. 397.

Erocentrus hamaticollis (Pasc.) is figured by Pascoe, Trans. Ent. Soc. Lond. vol. iii. pl. 2. fig. 9, and referred to the genus *Contoderus* (Thoms.) as identical with *C. acanthinodes* (Thoms.).

The following known species of this family are figured by Fairmaire (Gen. Col. Europe) :—

Spondylis buprestoides (Linn.), pl. 35. fig. 158; *Ergates faber* ♂ ♀ (Fab.), figs. 159 & 160; *Prinobius myardi* ♂ ♀ (Muls.), figs. 161 & 162; *Aulacopus serricollis* ♂ ♀ (Motsch.), pl. 36. figs. 163 & 164; *Ægosoma scabricorne* ♂ (Fab.), fig. 165; *Tragosoma depsarium* (Linn.), fig. 166; *Prionus besicanus* (Fairm.), pl. 37. fig. 167; *Asemum striatum* ♂ (Linn.), fig. 168; *Notorhina muricata* (Dalm.), fig. 169; *Anisarthron barbipes* ♂ (Chap.), fig. 170; *Criocephalus rusticus* ♂ (Linn.), fig. 171; *Cyamophthalma ferruginea*, pl. 38. fig. 172; *Tetrapium luridum* ♂ (Linn.), fig. 173; *Orypleurus nodieri* (Muls.), fig. 174; *Saphanus piceus* ♂ (Laich.), fig. 175; *S. truquii* ♀ (Muls.), fig. 176; *Azinopalpis gracilis* (Kryn.), pl. 39. fig. 177; *Hesperophanes sericeus* ♂ (Fab.), fig. 178; *Stromatium unicolor* ♂ (Oliv.), fig. 179; *Lioderes kollari* (Redt.), fig. 180; *Phymatodes melancholicus* ♂ (Fab.), fig. 181; *Pyrrhidium sanguineum* (Linn.), pl. 40. fig. 182; *Pœcilium alni* (Linn.), fig. 183; *Callidium violaceum* (Payk.), fig. 184; *C. unifasciatum* (Fab.), fig. 185; *Rhopalopus insubricus* (Germ.), fig. 186; *Semanotus ceneipennis* (Kriech.), pl. 41. fig. 187; *Hylotrypes bajulus* (Linn.), fig. 188; *Rosalia alpina* (Linn.), fig. 189; *Callichroma ambrosiaca* (Stev.), fig. 190; *Anoplistes cphippium* (Stev.), fig. 192; *Cerambyx mirbecki* (Luc.), pl. 42. fig. 191; *Calchaenesthes oblongomaculatus* (Germ.), fig. 193; *Periporicenus dalmatinus* (Sturm), fig. 194; *P. desfontainei* (Oliv.), fig. 195; *Xylotrechus arvicola* (Oliv.), fig. 196; *Clytus detritus* (Linn.), pl. 43. fig. 197; *C. floralis* (Pall.), fig. 198; *C. clavicornis* (Reiche), fig. 199; *C. plebejus* (Fab.), fig. 200; *Caloclytus semipunctatus* (Fab.), fig. 201; *Anaglyptus mysticus* (Linn.), pl. 44. fig. 202; *Teosium tomentosum* (Luc.), fig. 203; *Ex-*

ilia timida (Ménétr.), fig. 204; *Gracilia pygmæa* (Fab.), fig. 205; *Leptida brevipennis* (Muls.), fig. 206; *Cartallum ebulinum* (Linn.), pl. 45. fig. 207; *Callinus abdominalis* (Oliv.), fig. 208; *Stenopterus præustus* (Fab.), fig. 209; *Callimoxys gracilis* (Brullé), fig. 210; *Molorchus minor* (Linn.), fig. 211; *Conchopterus umbellatarum* (Linn.), pl. 46. fig. 212; *Brachypteroma ottomanum* (v. Heyd.), fig. 213; *Deilus fugax* (Fab.), fig. 214; *Ædilis edmondi* (Fairm.), fig. 215; *Leiopus femoratus* (Fairm.), fig. 216.

Pascoe redescribes *Driopea clytina* (Pasc.), l. c. p. 12; *Polimeta* (*Ostedes*) *spinosula* (Pasc.), l. c. p. 14; *Ostedes pauperata* (Pasc.), l. c. p. 15; *Acalolepta pusio* (Pasc.), l. c. p. 24; *Exocentrus hispidulus* (Pasc.), l. c. p. 29; *Sciades* (*Leiopus*) *suffusus* (Pasc.), l. c. p. 31; *Phlyarus basalis* (Pasc.), l. c. p. 42; *Gyaritus hamatus* (Pasc.) l. c. p. 45; *Dyemus* (*Gyaritus*) *laevicollis* (Pasc.) l. c. p. 54; *Ægomomus* (*Niphona*) *pullatus* (Pasc.), l. c. p. 62; *Ægom.* (*Niphona*) *insularis* (Pasc.), l. c. p. 65; *Eczemotes* (*Penthea*) *conferta* (Pasc.), l. c. p. 80; *Ælara* (*Niphona*) *arrogans* (Pasc.), l. c. p. 82, pl. 4. fig. 5; *Ischioplites* (*Symphyletes*) *metulus* (Pasc.), l. c. p. 82.

Lamiides.

PASCOE (l. c. pp. 6-9) divides this group into twenty-four sub-families, namely:—

1. *Acanthoderinæ*. Scape short, clavate; head dilated below the eyes; anterior and intermediate coxæ distinct; body depressed; anterior acetabula often entire; elytra triangular.

2. *Acrocininæ*. Scape somewhat elongate, clavate; anterior acetabula angulated; head dilated below the eyes; body depressed; elytra oblong.

3. *Acanthocininæ*. Head short in front, or transverse; scape elongate, not clavate; posterior tarsi elongated; femora clavate; antennæ slender.

4. *Colobothrinæ*. Anterior acetabula entire; scape elongated, cylindric; prothorax unarmed; intermediate tibiæ usually notched; body not depressed; femora clavate; elytra spinoso-truncate at apex.

5. *Erocentrinæ*. Anterior coxæ exerted, large; body depressed; head transverse in front; intermediate tibiæ notched; sides of prothorax usually spinose.

6. *Niphoninæ*. Scape short, clavate; prothorax generally bidentate in front; eyes nearly divided; head in front shortly ovate or quadrate; anterior coxæ spinose; prosternum elevated; labrum and epistome elongated; last joint of tarsi elongated.

7. *Mesosinæ*. Scape elongated, cylindric, produced and cicatricose at apex; prothorax unarmed; tarsi short, narrow, rarely dilated; anterior coxæ unarmed; head quadrate in front.

8. *Apomecyninæ*. Legs short; breast very short in front; apical joints of antennæ usually abbreviated, scape rather tumid, rarely elongated; body elongate, often fusiform; prothorax usually unarmed.

9. *Dorcadioninæ*. Elytra rounded at shoulders; wings deficient; body ovate, smooth or tuberculate, pilose or squamose; scape clavate or more or less elongate.

10. *Comptosominae*. Elytra triangular; scape pyriform; vertex elevated; intermediate coxæ approximate; body often armed; intermediate tibiæ emarginate.

11. *Hypselominæ*. Antennæ nearly contiguous at base; prothorax usually tuberculate at the sides; elytra triangular, crested at base; head elongato-quadrate; intermediate tibiæ notched.
12. *Lamiinæ*. Vertex elevated; femora simple; scape stout; prothorax armed at the sides; mesosternum elevated; mandibles large.
13. *Monochaminæ*. Head exserted; breast more or less elongated in front; antennæ approximate, scape elongated, cylindrical, cicatricose at apex, prothorax armed; femora simple.
14. *Gnomina*. Prothorax elongated, unarmed; legs very long; antennæ elongated, scape short; intermediate tibiæ notched.
15. *Oncocephalinæ*. Vertex narrow, head elongated below the eyes; anterior and intermediate coxæ approximate; antennæ usually pilose; prothorax unarmed; elytra wedge-shaped; claws usually simple.
16. *Hippopsinæ*. Vertex produced, face often horizontal; legs very short; intermediate and anterior coxæ distant; eyes distant from base of antennæ, sometimes divided; antennæ contiguous, setaceous or filiform; body elongate or linear.
17. *Agapanthinæ*. Antennæ 12-jointed; abdominal segments nearly equal; prothorax unarmed; intermediate tibiæ not emarginate; claws simple.
18. *Saperdinæ*. Tibiæ not emarginate; prothorax unarmed; femora not clavate; prosternum depressed; anterior and intermediate coxæ distant.
19. *Astatheina*. Eyes divided; claws usually appendiculate or bifid; prothorax gibbous, tuberculate on the sides.
20. *Obereinæ*. Claws appendiculate; legs very short; body linear; anterior coxæ *eductæ*.
21. *Phytæcinæ*. Claws appendiculate or bifid; abdomen short; legs moderate; body subcylindrical; anterior coxæ *eductæ*.
22. *Amphionychinæ*. Abdomen short, segments unequal; claws bifid; anterior coxæ *eductæ*.
23. *Tmesisterninæ*. Anterior coxæ inserted laterally; palpi acute; anterior and intermediate coxæ not contiguous; prosternum not distinct from the breast.
24. *Tapeininæ*. Antennæ distant from the eyes; eyes divided, deeply notched in ♀; anterior coxæ very distant; body flattened.

New genera :—

PASCOE characterizes the following genera of *Lamiidæ*; and as the majority of them are new, it will be as well to reproduce his tabular synopsis of their distinctive marks.

Of his *Acanthocininæ* he gives fourteen Malayan genera, tabulated as follows, *l. c.* p. 10:—

Basal joint of posterior tarsi elongate and filiform.

Scape reaching base of elytra 1. *Acanista*, g. n.

Scape not reaching base of elytra.

Scape more or less cylindric or fusiform.

Prothorax even.

Body depressed 2. *Driopea*, Pasc.

Body not depressed 3. *Chydæopsis*, g. n.

Prothorax uneven.

Prothorax alike in both sexes, its sides rounded.

4. *Polimeta*, g. n.

Prothorax elongated in ♂, its sides angulated.

5. *Ostedes*, Pasc.

Scape constricted beyond the middle, thickened at apex.

6. *Eoporis*, g. n.

Basal joint of posterior tarsi shorter and triangular.

Antennary tubers distant at base.

Anterior tarsi dilated 7. *Pithomictus*, g. n.

Anterior tarsi not dilated.

Antennæ rarely twice as long as body.

Basal joint of posterior tarsi longer than the two next together.

8. *Opsioteus*, g. n.

Disc even.

Prothorax oblong 9. *Mynonebra*, g. n.

Prothorax transverse 10. *Clodia*, g. n.

Disc tuberculate or uneven.

Prothorax subquadrate 11. *Olmotega*, g. n.

Prothorax transverse 12. *Phyxium*, g. n.

Antennæ three times as long as body 13. *Acalolepta*, Pasc.

Antennary tubers approximate at base 14. *Æschopalea*, g. n.

Of his *Exocentrinæ*, which agree with the *Pogonochéraitres* of Mulsant, except in the removal of *Stenidia* to the *Acanthocininæ* after Thomson's example, Pascoe characterizes forty-nine Malayan species, distributed in twenty-two genera, which he tabulates as follows, *l. c.* pp. 27, 28 :—

Prothorax armed at the sides.

Antennæ with slender cylindrical joints.

Metasternum not more than half length of abdomen.

Body with scattered erect hairs or setæ.

A single spine or tooth on each side of prothorax.

Antennæ setigerous 1. *Exocentrus*, Muls.

Antennæ setigerous beneath only (ciliated).

Prothorax with a long recurved spine 2. *Contoderus*, Thoms.

Prothorax with a short spine.

Tarsi linear 3. *Enes*, g. n.

Tarsi triangular 4. *Myromeus*, g. n.

More than one spine on each side of prothorax.

Prothorax with three spines 5. *Ombrosaga*, g. n.

Prothorax with an irregular toothed line 6. *Xanupta*, g. n.

Body simply pubescent.

Antennæ nearly twice as long as body.

Third and fourth joints twice as long as scape.

7. *Miana*, g. n.

Third or fourth joint scarcely longer than scape.

8. *Ægocidmus*, g. n.

Antennæ a little longer than body 9. *Sciades*, g. n.

Metasternum more than half length of abdomen 10. *Ipocheira*, g. n.

- Antennæ with thickened joints.
 Palpi pointed.
 Disc of prothorax unarmed.
 Prothorax transversely sulcated.
 Posterior tibiæ deeply notched 11. *Phylarus*, Pasc.
 Posterior tibiæ entire 12. *Athylia*, g. n.
 Prothorax not sulcated 13. *Camptomyne*, g. n.
 Disc of prothorax armed with two spines .. 14. *Gyaritus*, Pasc.
 Palpi securiform 15. *Azinyllium*, g. n.
 Prothorax unarmed at the sides.
 Scape of normal length; eyes emarginate.
 Antennæ slender, setaceous.
 Scape slender, cylindrical 16. *Emeopedus*, g. n.
 Scape short, thick 17. *Nesomomus*, g. n.
 Antennæ thickened, more or less linear.
 Antennæ fusiform 18. *Ebæides*, g. n.
 Antennæ not fusiform.
 Prothorax contracted at base 19. *Egesina*, g. n.
 Prothorax of nearly equal breadth throughout.
 Scape subcylindrical 20. *Enispia*, g. n.
 Scape elongato-pyriform 21. *Dyemus*, g. n.
 Scape very long; eyes divided 22. *Oloessa*, g. n.

In his subfamily *Nipponina* Pascoe describes fifty-seven species belonging to eighteen genera, which are tabulated as follows. He remarks that the characters employed are of secondary value (*l. c.* pp. 57-58) :—

- Mesosternum produced, or often toothed anteriorly.
 Antennary tubers distant (front flat or convex).
 Third joint of antennæ not longer than fourth.
 Intermediate and posterior tibiæ shorter than their tarsi.
 1. *Ælara*, Thoms.
 All the tibiæ longer than the tarsi.
 Head large, dilated below eyes in ♂. 2. *Abryna*, Newm.
 Head moderate or small.
 Elytra ribbed or crested at base.
 Outer margin of anterior tibiæ curved 3. *Aziothea*, g. n.
 Outer margin of anterior tibiæ straight 4. *Escharodes*, g. n.
 Elytra simple.
 Prothorax with a narrow longitudinal line.
 5. *Atyporis*, g. n.
 Prothorax simply convex 6. *Ægomomus*, g. n.
 Third joint of antennæ longer than fourth.
 Scape nearly cylindrical 7. *Eczemotes*, g. n.
 Scape clavate.
 Anterior tibiæ straight, unarmed 8. *Sympnyletes*, Newm.
 Anterior tibiæ curved, toothed internally in ♂.
 Head transverse anteriorly, eyes large 9. *Ischioplites*, Thoms.
 Head quadrate anteriorly, eyes small .. 10. *Xiphotheata*, g. n.
 Antennary tubers approximate (front concave).

- Tarsi dilated.
 Prosternum declivous anteriorly 11. *Sotades*, g. n.
 Prosternum perpendicular 12. *Mæchotypa*, Thoms.
 Tarsi not dilated.
 Anterior coxæ of male spined 13. *Menyllus*, g. n.
 Anterior coxæ of male unarmed 14. *Dystasia*, g. n.
 Mesosternum rounded anteriorly.
 Third joint of antennæ shorter than fourth.
 Elytra shortly trigonate 15. *Mispila*, g. n.
 Elytra oblong 16. *Dryusa*, g. n.
 Third joint of antennæ longer than fourth.
 Scape slightly clavate 17. *Exarrhenus*, g. n.
 Scape greatly enlarged at apex 18. *Dacata*, g. n.

The *Mesosina* of Pascoe (= *Mesosita*, Thoms.) include upwards of sixty Malayan species, arranged by Pascoe in twenty-one genera, as tabulated below, *l. c.* p. 96:—

- Fore tibiæ of males toothed internally.
 Prothorax unarmed.
 Elytra even 1. *Golsinda*, Thoms.
 Elytra irregular 2. *Goniages*, g. n.
 Prothorax toothed 3. *Palimna*, Pasc.
 Fore tibiæ entire.
 Prothorax not toothed at sides.
 Antennary tubers approximate 4. *Planodes*, Newm.*
 Antennary tubers remote.
 Antennæ simply fimbriated beneath.
 Head narrowed anteriorly.
 Eyes frontal 5. *Eris*, Pasc.
 Eyes lateral.
 Anterior tarsi simple 6. *Alc*, g. n.
 Anterior tarsi broadly dilated 7. *Phemone*, Pasc.
 Head broad anteriorly.
 Antennæ elongate, attenuated.
 Mesosternum elevated 8. *Æmocia*, Thoms.
 Mesosternum depressed 9. *Anancylus*, Thoms.
 Antennæ of moderate length, robust.
 Anterior tibiæ curved 10. *Agelasta*, Newm.
 Anterior tibiæ straight.
 Anterior tarsi elongate, dilated .. 11. *Syrhlopeus*, g. n.
 Anterior tarsi short, trigonate 12. *Sorbia*, g. n.
 Antennæ pilose.
 Pilosity confined to third and fourth joints.
 Apex of scape produced.
 Mesosternum toothed.
 Third and fourth joints of antennæ slender.
 13. *Cacia*, Newm.
 Third and fourth joints of antennæ thickened.
 14. *Ilelea*, g. n.
 Mesosternum simple 15. *Ipoerogyes*, g. n.

- Apex of scape rounded 16. *Diexia*, g. n.
 Pilosity diffused 17. *Sodus*, g. n.
 Prothorax with a tooth at the sides.
 Elytra crested at base 18. *Æsopida*, Thoms.
 Elytra not crested.
 Prosternum rounded posteriorly.
 Terminal joint of antennæ hooked in ♂ .. 19. *Coptops*, Serv.
 Terminal joint of antennæ not hooked .. 20. *Samia*, g. n.
 Prosternum produced posteriorly 21. *Clyzomedus*, g. n.

THOMSON has described a great number of new genera of this subfamily; we mention here those founded on species previously known, enumerating the others with the new species for which they have been established:—

Pycnomorphus, Syst. Cer. p. 15, type *Ægom. pubicornis* (Dej.), n. sp.; *Mysopsis*, p. 16 = *Myozinus* (Dej., Bates), the latter name being preoccupied by Gray in Mammalia; *Discopus* (Chev. MS.), p. 17, allied to *Acanthoderes*, type *Ac. spectabilis* (Bates); *Hedypathes*, p. 17, type *H. viduus* (Vigors); *Psapharochrus*, p. 18, type *Ac. cylindricus* (Bates); *Symperasmus*, p. 19, type *Ac. thomicus* (White); *Demophoo*, p. 21, allied to *Thryallis* (Thoms.), type *Onych. hamatus* (Chabr.); *Caciomorpha*, p. 22, allied to *Anisocerus*, type, *C. batesii* (Pasc.); *Alcathous*, p. 24, type *Alcidion polyrhapoides* (White); *Onalcidion*, p. 25, type *Alcidion pictulum* (White); *Astynomus* (Dej. ex parte), p. 29, type *A. dorsalis* (Germ.); *Synchyzopus*, p. 29, allied to *Colobotheca*, type *C. histrio* (Perty); *Somatidia*, p. 39, allied to *Parmena*, type *P. antarctica* (White); *Stenoparmena*, p. 39, type *P. crinita* (Germ.); *Camptocnema*, p. 54, allied to *Symphyletes*, type *Sthenias lateralis* (White); *Ælara*, p. 55, type *Æ. fermandi* (Paiva); *Cylanca*, p. 58, allied to *Golsinda*, type *G. tessellata* (Pasc.); *Synaphe*, p. 60, allied to *Mesosa*, type *M. guexii* (Leconte); *Aderpas*, p. 62, allied to *Coptops*, type *Crossotus* ? *griseus* (Thoms.); *Geteuma*, p. 65, type *Phymastema 4-dentata* (Coquerel); *Iothocera*, p. 75, allied to *Apriona*, type *Ap. tomentosa* (Buq.); *Dorcatypus*, p. 77, allied to *Morimus*, type *D. fairmairei* (Thoms.); *Epicedia*, p. 78, allied to *Morimus*, type *E. carcelii* (Guér.); *Dihammus*, p. 80, allied to *Monochamus*, type *D. longicornis* (Thoms.); *Potemnenus*, p. 81, type *P. scabrosus* (Oliv.); *Peribasis*, p. 86, allied to *Agnia*, type *Monochamus adspersus* (Pasc.); *Disterna*, p. 88, allied to *Zygocera*, type *Zyg. infusca* (Pasc.); *Nicippe*, p. 88, type *Zyg. complexa* (Pasc.); *Tropidema*, p. 88, type *Sphenura chrysocephala* (Coquerel); *Tlepolemus*, p. 106 = *Phymatoderus* (Dej.); *Præcha*, p. 107, allied to *Atazia*, type *A. spinipennis* (Chevr.); *Esthoglena*, p. 107 = *Hebestola* (Dej., Thoms., nec Blanch.); *Phidola* (Dej.), p. 110, type *P. maculicornis* (Chevr.); *Tropinnetopa*, p. 118, allied to *Astathes*, type *A. simulator* (Pasc.); *Cymbalia*, p. 119, allied to *Phytacia*, type *Saperda lichenigera* (Perty); *Musarie*, p. 120, allied to *Phytacia*, type *Saperda affinis* (Panz.); *Linda*, p. 122, allied to *Oberea*, type *Amphionycha femorata* (Chevr.); *Chereas*, p. 124, allied to *Callia*, type *Atelodesmis octomaculata* (Buq.); *Lycidola*, p. 125, type *Saperda palliata* (Klug); *Hydraschema*, p. 128, allied to *Phæbe*; *Autodice*, p. 128, type *Saperda picta* (Klug).

Pilemia, Fairmaire, Gen. Col. d'Eur. p. 175. Allied to *Phytacia*; head narrower than thorax; eyes almost completely divided; labrum sinuated;

antennæ thick, shorter than body, basal joint equal to third; prothorax transverse; elytra convex. Type *P. tigrina* (Muls.).

Helladia, Fairmaire, l. c. p. 176. Allied to preceding; labrum truncated; maxillary palpi with last joint nearly twice as long as third; antennæ scarcely shorter than body, first joint shorter than third; elytra flat above, sides perpendicular. Type *H. flavescens* (Brullé).

Conizonia, Fairmaire, l. c. p. 176. Allied to *Phytacia*; labrum short, sinuate, and strongly folded at extremity; maxillary palpi short, last joint fusiform; antennæ short. Type *C. vittigera* (Fab.).

Pheapate, Pascoe, Journ. of Ent. ii. p. 245. With the habit of *Ropica* (Pasc.), but with a differently formed prothorax.

Itheum, Pascoe, Journ. of Ent. ii. p. 230. Allied to *Atimura* (Pascoe). Head exserted, square in front; antennal tubercles distant. Eyes small, strongly notched. Antennæ short, fringed; scape long and attenuated; third and fourth joints very long, the rest short and equal. Elytra very narrow, emarginate at apex. Legs short, claws simple. Prosternum and mesosternum depressed. Segments of abdomen nearly equal. Sp. *I. vittigerum*, Pasc., and *I. lineare*, Pasc.

Nonyma, Pascoe, Journ. of Entom. ii. p. 270. Nearly allied to *Æschopalæa* (Pasc.), but with strong, divergent antenniferous tubercles, and the antennæ consequently distant at the base. Sp. *N. egregia*, Pasc., Natal.

Biasmia, Pascoe, l. c. p. 271 (*Exocentrinae*, Pasc.). With the prothorax convex, arched, forming a complete curve with the head. Antennæ short, distant, with the fifth and sixth joints plumose. Elytra regular, even, entire at the apex. Sp. *B. guttata*, Pasc., Natal.

Isse, Pascoe, l. c. p. 272 (*Exocentrinae*, Pasc.). Antennæ longer than the body, setose, distant at base; third and fourth joints equal, the rest gradually diminishing. Prothorax even, rounded on the sides, scarcely dentate in the middle. Elytra much wider than prothorax, convex, crested at base. Femora clavate. Sp. *I. punctata*, Pasc., Natal.

Æax, Pascoe, l. c. p. 273 (*Laminae*). Antennary tubercles divergent. Antennæ a little longer than body; scape cylindrical, cicatricose at apex; third and fourth joints equal, remainder decreasing. Prothorax quadrate; disc tuberculate; sides obtusely angulated. Elytra subtrigonal, crested at base. Femora clavate; anterior tibiæ straight; tarsi short, intermediate and posterior with the basal joint elongate-triangular. Pro- and mesosterna simple. Type, *Acmocera triangularis* (White).

Idactus, Pascoe, l. c. p. 273 (*Laminae*). Allied to *Æax* (Pasc.). Scape of antennæ obconical, scarcely cicatricose at apex; third joint a little longer than the scape, the rest gradually decreasing in length. Prothorax strongly angulated or dentate on the sides. Femora thickened; anterior tibiæ short, straight; posterior tarsi equal to the tibiæ. Sp. *I. tridens*, Pasc., Natal.

Emphreus, Pascoe, l. c. p. 274 (*Laminae*). Allied to *Phryneta*. Antennæ short; scape foveate, claviform; third joint shorter than fourth, the rest much shorter. Prothorax transverse, irregular, with an obtuse spine on each side. Elytra trigonal, crested at base. Femora sublinear; anterior tibiæ straight. Sterna simple. Type *Acmocera ferruginosa* (White), from Natal.

Chreostes, Pascoe, l. c. p. 274 (*Laminae*). Characters as in *Phryneta*, but with the eyes small and lateral. Sp. *C. ephippiatus*, Pasc., Natal.

Hagesata, Pascoe, *l. c.* p. 275 (*Lamiinæ*). Closely allied to *Anoplostheta*, but with a transverse sulcation above the epistome, and the prosternum toothed. The eyes are larger, the elytra more oblong, and the posterior tarsi longer. Sp. *H. foxcroftii*, Pasc. p. 276, from Sierra Leona.

Imalmus, Pascoe, *l. c.* p. 276 (*Lamiinæ*). Differs from *Hagesata* in its small eyes not approximated in front, in its large mandibles and short antennæ. Sp. *I. capito*, Pasc., and *I. fatidicus*, Pasc., from Old Calabar.

Oriæthus, Pascoe, *l. c.* p. 277 (*Dorcadioninæ*). Antenniferous tubercles strong, approximate at base. Antennæ very long; scape incrassate; last joint a little thickened. Prothorax quadrate, spinose on the sides. Elytra short, spinoso-cristate. Sterna simple. Sp. *O. longicornis*, Pasc. pl. 13. fig. 1, from Natal.

Opsies, Pascoe, *l. c.* p. 278 (*Dorcadioninæ*). Allied to *Dorcadion*, but distinguished from all the related genera by the great length of the scape, which is equal to the third and fourth joints together. Sp. *O. capra*, Pasc. p. 279, pl. 13. fig. 3, from Natal.

Apomempsis, Pascoe, *l. c.* p. 278, note (*Dorcadioninæ*). Nearly allied to the preceding, but with the third and fourth joints very long, equal to all the following ones taken together. Type, *Parmena bufo* (Chevr.).

Elithiotes, Pascoe, *l. c.* p. 279 (*Apomecyninæ*). Allied to *Phaula* (Thoms.), but with the whole surface pilose, the head transverse, convex, destitute of antenniferous tubercles, and the antennæ short, pilose, distant at the base, with a rather elongate, subcylindrical scape, and the joints gradually decreasing from the third. Sp. *E. hirsuta*, Pasc. p. 280, from Natal.

Hyagnis, Pascoe, *l. c.* p. 280 (*Apomecyninæ*). Antenniferous tubercles elongated and suberect. Antennæ with a short cylindrical scape. Prothorax cylindrical. Intermediate tibiæ slightly emarginate. Sterna simple. Body narrow. Sp. *H. fistularius*, Pasc., from Natal.

Atybe, Pascoe, *l. c.* p. 281 (*Apomecyninæ*). Vertex elevated. Antennæ remote, setaceous, subfimbriate, short, with the basal joint ovate, the third elongate, the fourth curved and shorter. Prothorax unarmed at the sides. Sterna dentate. Sp. *A. plantii*, Pasc., pl. 13. fig. 6, from Madagascar.

Cormia, Pascoe, *l. c.* p. 281. Allied to *Albana* (Muls.), but much more robust, with the antenniferous tubercles large, and approximated at the base, the scape cylindrical and short, the third joint of the antennæ much longer than the scape or the fourth joint, and the elytra irregular. Sp. *C. ingrata*, Pasc., p. 282, from Natal.

Syessita, Pascoe, *l. c.* p. 284. Nearly allied to *Ewidia*, but with the antennæ thicker throughout, the body depressed, the prothorax slightly toothed at the side, and the elytra with raised longitudinal lines. Sp. *S. vestigialis*, Pasc. (sec p. 437).

Hyllisia, Pascoe, *l. c.* p. 285. Nearly allied to *Agapanthia* and *Calamobius*, but with the antenniferous tubercles erect and approximate. Sp. *H. stenidioides*, Pasc., from Natal.

Criodula, Pascoe, *l. c.* p. 290. Differs from *Nonyma* in its more depressed form, in its oblong prothorax, narrowed at the base and minutely dentated at the sides, and in having the third joint of the antennæ longer than the scape. Sp. *C. strigata*, Pasc. p. 291, from Natal.

Baryssinus, Bates, Ann. Mag. Nat. Hist. 3rd ser. vol. xiii. p. 43. Allied to

Leptostylus. Thorax short and broad, widened posteriorly to lateral spines, which are very thick and placed near the hinder angles. Elytra with centro-basal tubercles, each with a pencil of hairs. Ovipositor projecting. Sp. *B. penicillatus* and *bilineatus*, Bates, p. 44, from the Amazons.

Chætanes, Bates, l. c. p. 45. Allied to *Trypanidius*. Thorax rather narrow; spines lateral. Elytra with crested centro-basal tubercles. Mesosternum without tubercles in ♂. Sp. *C. setiger*, Bates, from the Amazons.

Atrypanius, Bates, l. c. p. 46. Allied to *Trypanidius*. Head elongated in front. Eyes oblong. Mesosternum plane. Apical segment of abdomen obtuse. Sp. *A. conspersus* (Germ.)

Oxathres, Bates, l. c. p. 50. Nearly allied to *Probatius*. Abdomen in ♂ with apical ventral plate bidentate, in ♀ with a prolonged pointed dorsal plate and an exerted ovipositor. Sp. *O. navicella*, Bates, &c.

Trichonius, Bates, l. c. p. 52. Allied to *Probatius*. Terminal plates of abdomen obtuse. Ovipositor short. Elytra setose, without centro-basal tubercles. Sp. *T. quadrivittatus*, Bates, &c.

Sporetus, Bates, l. c. p. 54. Allied to *Probatius*. Body elongate-oblong. Thorax subquadrate; sides rounded; lateral spines small, tubercular. Sp. *S. porcinus*, and *seminalis*, Bates.

Seriphus, Bates, l. c. p. 144. Nearly allied to *Sporetus*. Body oblong-ovate, convex. Thorax convex; lateral spines small, tubercular, placed behind the middle. Sp. *S. viridis*, Bates, p. 145, from Ega.

Stenolis, Bates, l. c. p. 149. Allied to *Nyssodrys*. Body elongate, slightly convex. Thorax narrow; lateral spines forming minute tubercles. Apical segment of abdomen (in ♂) elongated, rounded, and entire at tip; ventral plate with a pencil of hairs on each side. Sp. *S. undulata*, Bates, from Ega.

Nyssodrys, Bates, l. c. p. 149. Form as in preceding. Lateral spines of thorax short, conical. Apical dorsal plate in ♂ entire or sinuated; ventral notched. Dorsal in ♀ pointed or obtuse; ventral truncated or faintly notched. Ovipositor elongated. Known species, *N. bispecularis* (White), l. c. p. 155; *N. alboplagiata* (White), l. c. p. 164.

Hylettus, Bates, op. cit. vol. xiv. p. 11. Allied to *Acanthocinus* and *Nyssodrys*. Elongate-oblong, depressed. Thorax uneven; lateral spines in the form of large tubercles. Fore and middle tarsi in ♂ much dilated and fringed with hairs. Dorsal and ventral plates of apical segment in ♂ notched; in ♀ dorsal pointed, ventral truncate. Type *Hylettus (Leipus) canobita* (Erichs.).

Palame, Bates, l. c. vol. xiv. p. 12. Allied to *Sporetus*. Body oblong, narrow, clothed with short setæ. Lateral spines of thorax very small, placed at hinder angles. Fore and middle tarsi dilated and fringed, and coxæ and sternum densely hairy in ♂. Ovipositor wanting. Sp. *P. crassimanus*, Bates, p. 13, from the Amazons.

Toronæus, Bates, l. c. p. 13. Allied to *Graphisurus*. Body convex. Antennæ greatly elongated, with long slender joints. Ovipositor much elongated; apical ventral plate in ♀ deeply cleft. Sp. *T. figuratus*, Bates, &c.; known species, *Eutrypanus tessellatus* (White) = *E. variegatus* (Dej.).

Callipero, Bates, l. c. p. 18. Antennæ with joints 3-7 thickened and clothed beneath with short setæ. Sp. *C. bella*, Bates, from San Paulo.

Xylergates, Bates, l. c. p. 20. Nearly allied to *Eutrypanus*, but with no

smooth lateral keels running from the shoulders of the elytra. Thorax tubercular; lateral tubercles near the middle of the sides. Sp. *X. lacteus*, Bates.

New species (Lamiides) :—

- Cypriola* (g. n.) *acanthocinoïdes*, Thoms. Syst. Cer. p. 16, from Peru?
Plistonax (g. n.) *multipunctatus*, Thoms. p. 19.
Scythropopsis (g. n.) *albitarsis* (Dej.), Thoms. p. 20, from Brazil.
Beloesthes (g. n.) *megabasoides*, Thoms. p. 24, origin not stated.
Tithonus (g. n.) *umbrosus*, Thoms. p. 24, origin not stated.
Cleodoxus (g. n.) *cristatus*, Thoms. p. 25, origin not stated.
Lathræus (g. n.) *oreoderoïdes*, Thoms. p. 25, origin not stated.
Hysterotarsus (g. n.) *batesii*, Thoms. p. 26, from the Amazons (= *Astyn. celebensis*, Thoms. olim).
Nedine (g. n.) *longipes*, Thoms. p. 27, from Siam.
Æmylus (g. n.) *figuratus*, Thoms. p. 28, from Cayenne.
Sparna (g. n.) *lycoides*, Thoms. p. 30, origin not stated.
Priscilla (g. n.) *hypsionoides*, Thoms. p. 31, from Cayenne.
Polyzo (g. n.) *viridescens*, Thoms. p. 32, origin not stated.
Elaïs (g. n.) *thoracica*, Thoms. p. 32, from Aru.
Craspedoderus (g. n.) *dilatocollis*, Thoms. p. 33, origin not stated.
Enotes (g. n.) *montrouzierii*, Thoms. p. 34, from New Caledonia.
Apolia (g. n.) *conicicollis*, Thoms. p. 34, origin not stated.
Sydonia (g. n.) *apomecynoides*, Thoms. p. 45, from Singapore.
Diboma (g. n.) *tranquilla* (Dej. MS.), Thoms. p. 46, from Bombay.
Hippaphesis (g. n.) *punctata*, Thoms. p. 46, from the Fiji Islands.
Cornallis (g. n.) *gracilipes*, Thoms. p. 47, from Eastern Asia.
Metretes (g. n.) *inæqualis*, Thoms. p. 47, from Madagascar.
Cenodocus (g. n.) *antennatus*, Thoms. p. 48, from Java.
Ecyroschema (g. n.) *favosa* (Klug, MS.), Thoms. p. 48, from the Cape of Good Hope.
Alyattes (g. n.) *guiennensis* (sic), Thoms. p. 49, from Guinea.
Prionetopsis (g. n.) *balteata* (Chevr. MS.), Thoms. p. 49, from India.
Nicomia (g. n.) *castelnaudii*, Thoms. p. 50, from Malasia.
Mycerinopsis (g. n.) *avida* (Pasc.), Thoms. p. 50, from N. Australia.
Eremon (g. n.) *mycerinoides*, Thoms. p. 51, from Guinea.
Epopœa (g. n.) *acuta* (Dej. ?), Thoms. p. 51, from Senegal.
Platymopsis (g. n.) *spinosa*, Thoms. p. 52, from Moreton Bay.
Ischioplites (g. n.) *mitutus* (Pasc. MS.), Thoms. p. 53, from Aru.
Superdopsis (g. n.) *armata*, Thoms. p. 53, from Australia.
Ocheutes (g. n.) *scopulifera* (Dej.), Thoms. p. 54, from Siam.
Mæchotypa (g. n.) *arida*, Thoms. p. 55, from Laos.
Velora (g. n.) *australis*, Thoms. p. 56, from Australia.
Probatodes (g. n.) *plumula* (Newm.), Thoms. p. 57, from Australia.
Calymmophis (g. n.) *flavovariegata*, Thoms. p. 59, from Malasia.

- Grammoëchus* (g. n.) *polygrammus*, Thoms. p. 60, from Malasia.
Anancyllus (g. n.) *calceatus* (Dej.), Thoms. p. 61, from Java.
Æmocia (g. n.) *ichthyosomoides*, Thoms. p. 61, from Ceram.
Æsopida (g. n.) *malasiaca*, Thoms. p. 62.
Trachystola (g. n.) *scabripennis* (Dej.), Thoms. p. 63, from Java.
Anamera (g. n.) *alboguttata*, Thoms. p. 63, from Laos.
Ancita (g. n.) *crossotoïdes*, Thoms. p. 64, from North Australia.
Ranova (g. n.) *pictipes* (Chevr. MS.), Thoms. p. 64, from Madagascar.
Tetradia (g. n.) *fasciatocollis*, Thoms. p. 65, from Natal.
Ioesse (g. n.) *sanguinolenta*, Thoms. p. 68, from Malacca.
Nemophas (g. n.) *batoceroïdes*, Thoms. p. 75, from Timor.
Archidice (g. n.) *castelnaudii*, Thoms. p. 79, from Malasia.
Agnoderus (g. n.) *gnomoïdes*, Thoms. p. 83, from India.
Combe (g. n.) *fulgurata*, Thoms. p. 84, origin not stated.
Uroëcha (g. n.) *bimaculata*, Thoms. p. 85, from Japan.
Amechana (g. n.) *nobilis*, Thoms. p. 85, from Malasia.
Pharsalia (g. n.) *malasiaca*, Thoms. p. 86, from Malasia.
Apatelarthron (g. n.) *heteroclitum*, Thoms. p. 89, from Malasia.
Epicasta (g. n.) *ocellata*, Thoms. p. 90, from Java.
Xenclea (g. n.) *collaris*, Thoms. p. 91, origin not stated.*
Cleptometopus (g. n.) *terrestris*, Thoms. p. 96, from Malasia.
Anandra (g. n.) *capriciosa*, Thoms. p. 96, from Malasia.
Ectinogramma (g. n.) *isosceloides*, Thoms. p. 96, from Malasia.
Pothyne (g. n.) *variegata*, Thoms. p. 97, from Malasia.
Aliboron (g. n.) *antennatum*, Thoms. p. 98, from Malasia.
Aulaconotus (g. n.) *pachypezoides*, Thoms. p. 99, from Japan.
Typoceta (g. n.) *subfasciata*, Thoms. p. 99, from Guinea.
Atossa (g. n.) *strenua* (Dej.), Thoms. p. 101, from Java.
Helvina (g. n.) *uncinata*, Thoms. p. 104, from Cayenne.
Rosalba (g. n.) *alcidionoides*, Thoms. p. 109, from Columbia.
Blabia (g. n.) *colobothoides*, Thoms. p. 109, from Columbia.
Unelcus (g. n.) *pictus*, Thoms. p. 109, origin not stated.
Bebelis (g. n.) *lignosa* (Dej.), Thoms. p. 110, origin not stated.
Oligopsis (g. n.) *exocentroides*, Thoms. p. 111, from Ceylon.
Contoderus (g. n.) *acanthocinoides*, Thoms. p. 112, from Aru.
Sumelis (g. n.) *singularis*, Thoms. p. 112, from Natal.
Cagosima (g. n.) *sanguinolenta*, Thoms. p. 116, from Japan.
Thyestes (g. n.) *pubescens*, Thoms. p. 116, from Japan.
Cleonaria (g. n.) *bicolor*, Thoms. p. 119, from Siam.
Alicia (g. n.) *flavescens*, Thoms. p. 125, from Brazil.
Themistonoë (g. n.) *cacica* (Dej.), Thoms. p. 126, from South America?
Pannychis (g. n.) *sericeus* (Dej.), Thoms. p. 127, from Mexico.
Hydraschema (g. n.) *fabulosa*, Thoms. p. 128, from Brazil.

Brachychilus modestus, Philippi, Stett. ent. Zeit. 1864, p. 383, from Chili.
Acanista (g. n.) *alphoides*, Pasc. Trans. Ent. Soc. Lond. p. 11, pl. 1. fig. 3, from Mysol.

Driopea inermis, Pasc. l. c. p. 12, from Dorey, Waigiou, &c.

Chydæopsis (g. n.) *fragilis*, Pasc. l. c. p. 13, pl. 1. fig. 1, from Sarawak.

Polimeta, g. n., Pasc. l. c. p. 13. Type *Ostedes spinosula* (Pasc.). N. sp.
Polimeta simplex, Pasc. l. c. p. 14, from Batchian, Ceram, Gilolo, &c.

Eoporis (g. n.) *elegans*, Pasc. l. c. p. 16, pl. 1. fig. 6, from Singapore, Sarawak, Ceram, Dorey, &c.

Pithomictus (g. n.) *decoratus*, Pasc. l. c. p. 16, pl. 2. fig. 1, from Morty.

Opsioleus (g. n.) *adversus*, Pasc. l. c. p. 17, pl. 2. fig. 7, from Malacca.

Mynonebra, g. n., Pasc. l. c. p. 17. Of this Pascoe describes five species: namely, *Mynonebra diversa*, l. c. p. 18, pl. 1. fig. 7, and *M. sparsuta*, ibid., from Waigiou; *M. villica*, l. c. p. 19, from Mysol; *M. consputa*, ibid., from Batchian and Gilolo; and *M. angulata*, ibid., from Morty.

Clodia (g. n.) *sublineata*, Pasc. l. c. p. 20, pl. 1. fig. 8, from Batchian.

Olmotega (g. n.) *cinerascens*, Pasc. l. c. p. 21, pl. 1. fig. 5, from Kaioa.

Phyxium, g. n., Pascoe, l. c. p. 21, resembles the Brazilian genus *Onychocerus* in form. Pascoe describes three species: namely, *Phyxium bufonium*, l. c. p. 22, pl. 2. fig. 3, from Batchian; *P. scorpoides*, ibid., from Aru; and *P. ignarum*, l. c. p. 23, from Mysol.

Æschopalea, g. n., Pascoe, l. c. p. 24, resembles *Monochamus*. Pascoe describes four species: namely, *Æschopalea agraria*, l. c. p. 24, pl. 1. fig. 2, from Ceram; *Æ. tomentosa*, l. c. p. 25, from Singapore and Macassar; *Æ. grisella*, ibid., from Aru; and *Æ. laticollis*, ibid., from Mysol.

Exocentrus. Of this genus Pascoe describes five Malayan species, including *E. hispidulus* (Pasc.). The new species are: *E. centenes*, l. c. p. 29, from Batchian and Flores; *E. lachrymosus*, ibid., from Sarawak; *E. echimys*, l. c. p. 30, from Morty; and *E. marens*, ibid., from Singapore.

Sciades, g. n., Pascoe, l. c. p. 30. Nearly allied to *Exocentrus*. Described species, *Sciades (Leipus) suffusus* (Pasc.). New species, *Sciades mutatus*, Pasc. l. c. p. 31, and *S. melanotis*, Pasc. ibid., pl. 2. fig. 2; both from Aru.

Enes, g. n., Pascoe, l. c. p. 32. Pascoe describes seven species: namely, *Enes intinctus*, l. c. p. 33, pl. 2. fig. 5, from Dorey; *E. juvenis*, l. c. p. 33, from Ceram; *E. obliquus*, l. c. p. 34, from Ceram; *E. familiaris*, ibid., from Ternate; *E. pulicaris*, ibid., from Flores; *E. porcellus*, l. c. p. 35, from Timor; and *E. irritans*, ibid., from Ceram.

Ipochira (g. n.) *perlata*, Pasc. l. c. p. 36, pl. 2. fig. 4, from Gilolo, Batchian, Ceram, &c.

Myromeus (g. n.) *subpictus*, Pasc. l. c. p. 37, pl. 4. fig. 1, from Ceram.

Ombrosaga (g. n.) *maculosa*, Pasc. l. c. p. 37, pl. 2. fig. 6, from Tondano.

Xænapta (g. n.) *latimana*, Pasc. l. c. p. 38, pl. 3. fig. 3, from Sarawak.

Miænia, g. n., Pasc. l. c. p. 38. Pascoe describes three species: namely, *Miænia marmorea*, l. c. p. 39, pl. 3. fig. 6, from Salwatty; *M. irrorata*, l. c. p. 39, from Batchian; and *M. perversa*, l. c. p. 40, from Mysol and Bouru.

Ægocidnus, g. n., Pasc. l. c. p. 40. Pascoe describes the following four species: *Ægocidnus grammicus*, l. c. p. 40, pl. 3. fig. 2, from Bouru; *Æ.*

jubatus, l. c. p. 41, from Macassar; *Æ. ignarus*, ibid., from Sula; and *Æ. costulatus*, ibid., from Banka.

Athylia (g. n.) *avara*, Pasc. l. c. p. 43, pl. 3. fig. 11, from Ternate.

Camptomyne, g. n., Pasc. l. c. p. 43. Pascoe describes three species: namely, *Camptomyne callioides*, l. c. p. 44, from Aru; *C. bicolor*, ibid., pl. 3. fig. 10, from Batchian; and *C. tristis*, l. c. p. 44, from Batchian.

Gyaritus cinnamomeus, Pasc. l. c. p. 46, and *Gyaritus fulvopictus*, Pasc. ibid., from Sarawak.

Axinyllium, g. n., Pasc. l. c. p. 46. Remarkable for its securiform palpi. Sp. *Axinyllium varium*, Pasc. l. c. p. 47, pl. 3. fig. 8, from Sarawak.

Emeopedus, g. n., Pascoe, l. c. p. 47. Resembling *Leiopus* in appearance. Pascoe describes three species: namely, *Emeopedus solutus*, l. c. p. 48, pl. 3. fig. 5, from Batchian; *E. insidiosus*, l. c. p. 48, from Batchian and Kaioa; and *E. degener*, ibid., from Ceram.

Nesomomus (g. n.) *servus*, Pasc. l. c. p. 49, pl. 2. fig. 8, from Morty.

Egesina (g. n.) *rigida*, Pasc. l. c. p. 50, pl. 3. fig. 12, from Singapore.

Enispiia (g. n.) *venosa*, Pasc. l. c. p. 51, pl. 3. fig. 1, from Java.

Ebæides, g. n., Pasc. l. c. p. 51. This genus is remarkable for the thickening of the third, fourth, and fifth joints of the antennæ, and for having the last joint very small. The antennæ are sometimes composed of only ten joints. Pascoe describes five species: namely, *Ebæides monstrosa*, l. c. p. 52, pl. 3. fig. 7, *E. viduata*, l. c. p. 52, and *E. rufula*, ibid., all from Sarawak; *E. palliata*, l. c. p. 53, from Sarawak and Tondano; and *E. exigua*, ibid., from Singapore.

Dyemus (g. n.) *puncticollis*, Pasc. l. c. p. 54, from Sarawak; *Dyemus lævicollis*, Pasc. ibid., pl. 3. fig. 9, from Aru, Batchian, Ceram, &c.

Oloëssa, g. n., Pasc. l. c. p. 55. Closely allied to *Cyrtinus* (Leconte). Remarkable for the form of the scape, which is long, slender, and broadly clavate at the apex. Sp. *O. minuta*, Pasc. l. c. p. 56, pl. 3. fig. 4, from Aru.

Ægomomus, g. n., Pasc. l. c. p. 59. Allied to *Niphona*, but broader and more robust. Pascoe describes the following nineteen species, many of which are nearly allied: *Ægomomus encaustus*, l. c. p. 59, from Bouru; *Æ. viduatus*, ibid., pl. 4. fig. 3, from Amboyna; *Æ. maculosus*, l. c. p. 60, from Timor; *Æ. sparsutus*, ibid., from Batchian, &c.; *Æ. litigiosus*, l. c. p. 61, from Gilolo and Batchian; *Æ. affectus*, ibid., from Batchian; *Æ. pullatus* (= *Niphona pullata*, Pasc.), from Sumatra, &c.; *Æ. villaris*, l. c. p. 62, from Gagie, near Waigiou; *Æ. malignus*, ibid., from Mysol; *Æ. ominosus*, l. c. p. 63, from Gilolo; *Æ. vexatus*, ibid., from Saylee; *Æ. vulgus*, l. c. p. 64, from Dorey; *Æ. petechialis*, ibid., from Morty; *Æ. infelix*, ibid., from Gilolo and Batchian; *Æ. insularis*, l. c. p. 65 (= *Niphona insularis*, Pasc.); *Æ. musivus*, l. c. p. 65, from Timor; *Æ. uniformis*, l. c. p. 66, from Bouru; *Æ. elusus*, ibid., from Ceram; and *Æ. truncatus*, l. c. p. 67, from Mysol.

Atyporis, g. n., Pasc. l. c. p. 67. Pascoe describes five species of this genus: namely, *Atyporis jubata*, l. c. p. 68, from Batchian; *A. sturnina*, ibid., pl. 4. fig. 7, from Aru; *A. intermissa*, l. c. p. 69, from Dorey; *A. perversa*, ibid., from Batchian; and *A. molesta*, ibid., from Dorey.

Escharodes, g. n., Pasc. l. c. p. 70. Pascoe describes four species: namely, *Escharodes interruptus*, l. c. p. 71, pl. 5. fig. 1, from Morty and Gilolo; *E.*

carinicollis, ibid., from Aru, Batchian, &c.; *E. paganus*, l. c. p. 72, from Aru; and *E. crimosus*, ibid., from Saylee.

Aziothea, g. n., Pasc. l. c. p. 72. Species, *Aziothea strenua*, l. c. p. 73, from Auloayna, Batchian, Mysol, Morty, and Kaioa; *A. distincta*, ibid., pl. 4. fig. 6, from Ceram; *A. invida*, l. c. p. 74, from Batchian.

Sotades, g. n., Pasc. l. c. p. 74. Pascoe describes the following four species: *Sotades platypus*, l. c. p. 75, pl. 6. fig. 4, from Ternate, Kaioa, and Morty; *S. caprinus*, ibid., from Morty and Batchian; *S. fatidicus*, l. c. p. 76, from Kaioa; and *S. agrestis*, ibid., from Ternate.

Symphyletes (Newm.). Pascoe, l. c. p. 77, considers that this genus, consisting chiefly of Australian forms, is very heterogeneous in its contents—in fact, that it is “a collection of many genera.” He describes three new species from the Malayan region: namely, *Symphyletes wallucei*, l. c. p. 77, from Matabello; *S. pustulosus*, l. c. p. 78, from Aru; and *S. squamosus*, l. c. p. 79, from Dorey.

Symphyletes fumatus, Pasc. Journ. of Ent. ii. p. 224, *Symphyletes angasii*, Pasc. l. c. p. 225, pl. 11. fig. 1, and *Symphyletes vestigialis*, Pasc. l. c. p. 226, from South Australia.

Symphyletes egenus, Pasc. l. c. p. 225, from Northern Australia; *Symphyletes gallus*, Pasc. l. c. p. 226, from the interior of Australia.

Eczemotes, g. n., Pasc. Trans. Ent. Soc. Lond. p. 79. Very closely allied to *Penthea*: type *Eczemotes confecta*, l. c. p. 80 (= *Penthea confecta*, Pasc.). Two new species are described by Pascoe: namely, *Eczemotes atomaria*, l. c. p. 80, pl. 4. fig. 4, from Kaioa; and *E. agnata*, l. c. p. 81, from Saylee.

Abryna buccinator, Pasc. l. c. p. 84, from Sumatra; *Abryna rubeta*, Pasc. ibid., from Sarawak.

Mæchotypa marmorea, Pasc. l. c. p. 85, from Sarawak.

Exarrhenus (g. n.) *egens*, Pasc. l. c. p. 86, pl. 5. fig. 5, from Saylee.

Menyllus (g. n.) *maculicornis*, Pasc. l. c. p. 87, pl. 5. fig. 6, from Aru.

Daxata (g. n.) *camelus*, Pasc. l. c. p. 88, pl. 4. fig. 2, from Sarawak.

Dystasia (g. n.) *semicana*, Pasc. l. c. p. 89, from Singapore; *D. circulata*, Pasc. ibid., pl. 5. fig. 4, from Sarawak.

Mispila (g. n.) *venosa*, Pasc. l. c. p. 90, pl. 5. fig. 2, from Sarawak and Batchian.

Dryusa, g. n., Pasc. l. c. p. 91. Of this genus Pascoe describes the following four species: *D. dotata*, l. c. p. 92, pl. 5. fig. 3, from Batchian; *D. flexuosa*, l. c. p. 92, from Mysol, Aru, and Ceram; *D. rufula*, ibid., from Saylee; and *D. diluta*, l. c. p. 93, from Ceram.

Xiphotheata (g. n.) *saundersii*, Pasc. l. c. p. 94, pl. 5. fig. 7, from Batchian, Morty, and Gilolo.

Niphona torosa, Pasc. Journ. of Entom. ii. p. 223, from South Australia.

Penthea intricata, Pascoe, l. c. p. 227, and *Penthea picta*, Pasc. ibid., pl. 11. fig. 5, from South Australia; *Penthea crassicollis*, Pasc. ibid., from the interior of Australia.

Rhytiphora waterhousei, Pasc. l. c. p. 228, from South Australia.

Monochamus orinus, Pasc. l. c. p. 228, from South Australia.

Microtragus waterhousei, Pasc. l. c. p. 229, from Kangaroo Island.

Itthem (g. n.) *vittigerum*, Pasc. Journ. of Entom. ii. p. 230, pl. 11. fig. 9, and *I. lineare*, Pasc. *ibid.*, from South Australia.

Sophronica carbonaria (Dej. ?), Pasc. *l. c.* p. 282, from the Cape of Good Hope.

Alphitopola fievora, Pasc., and *Alphitopola intricata*, Pasc. *l. c.* p. 283, both from Natal.

Eumidia fulva, Pasc., and *Eumidia timida*, Pasc. *l. c.* p. 283, from Natal.

Hecyra frontalis, Pasc. *l. c.* p. 272, from Damara-land.

Phryneta suturalis, Pasc. *l. c.* p. 277, from Old Calabar.

Phantasis heros, Pasc. *l. c.* p. 279, pl. 13. fig. 7, from Natal.

Syessita (g. n.) *vestigialis*, Pasc. *l. c.* p. 284, *S. divisa*, Pasc. *ibid.*, and *S. duplicata*, Pasc. *l. c.* p. 285, from Natal.

Probatius. Bates describes four new species of this genus from the Amazons valley: *Probatius chryseis*, *l. c.* p. 47; *P. partitus* (White), *l. c.* p. 48; *P. apicalis*, *l. c.* p. 49; and *P. ramulorum*, *ibid.*

Ozathres (g. n.) *navicula*, Bates, *l. c.* p. 50; *O. erotyloides*, Bates, *l. c.* p. 51; *O. muscosus*, Bates, *l. c.* p. 52; from the Amazons valley.

Trichonius (g. n.) *quadrivittatus*, Bates, *l. c.* p. 53; *T. fuscatus*, Bates, *ibid.*, and *T. picticollis*, Bates, *ibid.*, from the Amazons valley.

Sporetus (*Chetisus*) *porcinus*, Bates, *l. c.* p. 54, from the Upper Amazons; *S. seminalis*, Bates, *l. c.* p. 55, from the Amazons and Cayenne.

Edopeza leucostigma, Bates, *l. c.* p. 146 from Ega; *Æ. litigiosa*, Bates, *l. c.* p. 146, note, from Rio Janeiro; *Æ. guttigera*, Bates, *l. c.* p. 147, note, from Mexico; *Æ. apicalis*, Bates, *ibid.*, from Guatemala.

Cosmotoma rubella, Bates, *l. c.* p. 148, from the Lower Amazons; *C. nigricollis*, Bates, *ibid.*, from the Upper Amazons.

Nyssodrys (g. n.). Bates describes 25 new species of this genus from the Amazons, and three from other parts of America. AMAZONIAN SPECIES: *N. sedata*, *l. c.* p. 150; *N. lentiginosa*, *ibid.*; *N. cinerascens*, *l. c.* p. 151; *N. corticalis*, *ibid.*; *N. spreta*, *l. c.* p. 152; *N. binoculata*, *l. c.* p. 153; *N. grisella*, *l. c.* p. 154; *N. fulminans*, *ibid.*; *N. guttula*, *l. c.* p. 155; *N. incisa*, *ibid.*; *N. anceps*, *l. c.* p. 156; *N. stillata*, *ibid.*; *N. vitticollis*, *l. c.* p. 157; *N. caudata*, *ibid.*; *N. signifera*, *l. c.* p. 158; *N. propinqua*, *l. c.* p. 159; *N. simulata*, *ibid.*; *N. efficta*, *l. c.* p. 160; *N. deleta*, *ibid.*; *N. rodens*, *l. c.* p. 161; *N. lineolata*, *ibid.*; *N. promeces*, *l. c.* p. 162; *N. ptericopta*, *l. c.* p. 163; *N. ramea*, *ibid.*; *N. excelsa*, *ibid.* FROM OTHER LOCALITIES: *N. contempta*, Bates, *l. c.* p. 152, note, from Mexico; *N. lignaria*, Bates, *ibid.*, from Rio Janeiro; *N. dioptica*, Bates, *l. c.* p. 153, note, from Rio Janeiro.

Hylettus (g. n.) *deccorticans*, Bates, Ann. & Mag. Nat. Hist. vol. xiv. p. 12, note, from Venezuela.

Toronæus (g. n.) *figuratus*, Bates, *l. c.* p. 14, from Obydos; *T. suavis*, Bates, *l. c.* p. 15, from the Lower Amazons; *T. perforator*, Bates, *l. c.* p. 16, from the Amazons and Cayenne; *T. virens*, Bates, *l. c.* p. 17, from the Amazons; *T. terebrans*, Bates, *ibid.*, from S. Paulo.

Cobelura proliza, Bates, *l. c.* p. 19, from Santarem.

Xylergates (g. n.) *lacteus*, Bates, *l. c.* p. 20, from the Upper Amazons; *X. asper*, Bates, *l. c.* p. 21, note, from South Brazil.

Eutrypanus nobilis, Bates, l. c. p. 22; *E. incertus*, Bates, c. p. 23; and *E. assula*, ibid. : all from the Lower Amazons.

Lepturides.

New genera :—

THOMSON (Syst. Ceramb.) establishes the following new genera in this subfamily :—

Dejanira, p. 134, allied to *Rhagiomorpha*; *Tropocalymma*, p. 138 = *Æyorrhina* (Dej.), type *Tropis dimidiata* (Newm.); *Mythodes*, p. 139, allied to *Syllitus*; *Artelida*, p. 143, allied to *Mastododera*; *Sagridola*, p. 143, type *Toxotus maculosus* (Guér.); *Aristogilus*, p. 145, allied to *Stenocorus*, type *S. cylindricus* (Thoms.); *Plangone*, p. 154, allied to *Pempsamaera*.

Omphana, Pascoe, Journ. of Ent. ii. p. 230. Nearly allied to *Pytheus* and *Brachytiria*, but the antennæ of ten joints, third and fourth of ordinary length, not abbreviated. No antenniferous tubercles. Eyes nearly divided. Sp. *O. kruesleri*, Pasc.

Mystrosa, Pascoe, l. c. p. 239. Intermediate between *Uracanthus* and *Bardistus*, but most nearly allied to the former. Eyes large, slightly emarginate. Antennæ scarcely longer than the body; scape ovate. Palpi cylindrical. Prothorax oblong, its sides nodose in the middle. Elytra elongate, truncate at the apex. Anterior acetabula broadly angulated. Anterior and intermediate coxæ distant. Legs rather short; femora compressed, scarcely clavate. Abdomen exceeding the elytra, constricted in the middle, depressed at the apex. Sp. *M. rubiginea*, Pasc.

Earinis, Pascoe, l. c. p. 240. Most nearly allied to *Tropis*. Head somewhat produced; antenniferous tubercles distant. Epistome concealed. Labrum minute. Palpi short. Eyes reniform. Antennæ 11-jointed, short. Prothorax with the sides angulated behind the middle, constricted before and behind. Elytra narrow, abbreviated, divaricate at the apex. Abdomen elongated, with equal segments. Anterior coxæ approximated. Anterior acetabula broadly angulated. Mesosternum small. Sp. *E. mimula*, Pasc.

Psebum, Pascoe, l. c. p. 289. Nearly allied to *Akiptera*. Eyes large, uniform. Antennæ elongated, robust, not compressed, distant; scape very short; third joint three times the length of the scape, the rest shorter, except the last, which is elongated, and incised at the side near the apex. Elytra abbreviated. Anterior and intermediate legs short, incrassated. Sp. *P. brevipenne*, Pasc.

Otteissa, Pascoe, l. c. p. 286. Allied to *Toxotus*, but the prothorax unarmed, the fourth joint of the antennæ of the ordinary length, and the mesosternum sloping. Sp. *O. sericea*, Pasc.

New species :—

Dejanira (g. n.) *quadripunctata*, Thoms. p. 134, from Java.

Mythodes (g. n.) *plumosa*, Thoms. p. 139, from Malasia.

Artelida (g. n.) *crinipes*, Thoms. p. 143, from Madagascar.

Plangone (g. n.) *biseburata*, Thoms. p. 155, from Ceylon.

Gaurotes cressoni, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 69, from the Colorado territory.

Omophaena (g. n.) *kruesleri*, Pasc. l. c. p. 231, pl. 11. fig. 8, from South Australia.

Phlyctenodes pilosus, Pasc. l. c. p. 234, from S. Australia.

Uracanthus fuliginosus, Pasc. l. c. p. 238, from S. Australia.

Mystroa (g. n.) *rubiginea*, Pasc. l. c. p. 239, pl. 11. fig. 2, from S. Australia.

Akiptera waterhousei, Pasc. l. c. p. 239, pl. 11. fig. 4, from S. Australia. Description accompanied by a diagnosis of the genus *Akiptera* (W. W. Saunders).

Earinis (g. n.) *mimula*, Pasc. l. c. p. 241, pl. 11. fig. 3*, from S. Australia.

Psebius (g. n.) *brevipennis*, Pasc. l. c. p. 290, pl. 13. fig. 2, from Natal.

Otteissa (g. n.) *sericea*, Pasc. l. c. p. 286, from Natal.

Holopterus sublineatus, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 273, from Mendoza.

Leptura atro-vittata, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 255, from New Jersey.

Cerambycides.

New genera :—

THOMSON describes numerous new genera belonging to this subfamily. The following are founded on species previously known; the others will be enumerated with the new species for which they have been established :—

Erythresthes, p. 158, allied to *Pseudoleptura*, type *E. bowringii* (Pasc.); *Bromiades*, p. 165, allied to *Acyphoderes*, type *B. brachyptera* (Chevr.); *Thalusia*, p. 168, type *T. erythromera* (Dej., Serv.); *Closteropus* (Dej.), p. 169, type *C. blandus* (Guér.); *Philemutium*, p. 171, allied to *Callichroma*, type *C. albitarsis* (Fab.); *Hyppatium*, p. 172, type *Aromia nitidicollis* (Guér.); *Aphrodisium*, p. 173, type *C. cantori* (Hope); *Chloridolum*, p. 174, type *C. bivittatum* (White); *Chelidonium*, p. 175, type *C. argentatus* (Dalm.); *Anubis*, p. 177, allied to *Zonopterus*, type *C. sexnotatus* (Thbg.); *Rhopalixus*, p. 179, type *C. chevrolatii* (Thoms.); *Dezitheia*, p. 185, allied to *Trichorys*, type *Clytus klugii* (Lap.); *Sarosesthes*, p. 185, allied to *Ochraesthes*, type *Clytus fulminans* (Fab.); *Clytanthus*, p. 190 = *Anthoboscus* (Chevr.), name preoccupied; *Euryphagus*, p. 196 = *Eurycephalus* (Lap.), name preoccupied; *Euryclea*, p. 196, type *E. cardinalis* (Thoms.); *Ischnocnemis*, p. 199 = *Leptocnemis* (Dej.); *Batyle*, p. 201, allied to *Eriphus*, type *Callidium ignicolle* (Say); *Olbins*, p. 204, type *Clytus scurfasciatus* (Fab.); *Lissonotypus*, p. 211, allied to *Trachelia*, type *Lissonotus ? brasiliensis* (Buq.); *Callopsisma*, p. 212, allied to *Ancylocera*, type *A. curvicolis* (Buq.); *Ornithia*, p. 213, type *Trich. chevrolatii* (Guér.); *Octoplon*, p. 218, type *Cerambyx læsicollis* (Germ.); *Gnomidolon*, p. 219, type *Ibidion biarcuatum* (White); *Neocorus*, p. 220, type *Stenogrypha ibidionoides* (Serv.); *Harpeser*, p. 221, allied to *Piezocera*, type *Ozodes brevipes* (White); *Pelossus*, p. 222, type *Corethrogaster ruber* (Thoms.); *Tenthras*, p. 224 = *Eurypygon* (Dej.), preoccupied; *Prosphilus*, allied to *Hammaticherus*, type *H. pilosicollis* (Hope); *Hoplocerambyx*, p. 229, allied to *Cerambyx*, type *Hamm. spinicornis* (Newm.); *Conothorax*, p. 230, type *C. pascoei* (Thoms.); *Lachnopterus*, p. 231, allied to *Pachydissus*, type *Cerambyx auripennis* (Pasc.); *Callidiopsis*, p. 237, allied to *Callidium*, type *C. scutellare* (Fab.); *Drymo-*

p. 242, allied to *Eburia*, type *Cæleburia pulvereæ* (Chevr.); *Eleutho*, p. 242, type *Eburia consobrina* (Duval); *Peribæum*, p. 245, = *Nephalius* (Thoms. nec Newm.); *Appula*, p. 245, type *Mallocera lateralis* (White); *Prosyope*, p. 248, allied to *Temnopsis*, type *Eme filiformis* (Buq.); *Hypæschrus*, p. 249, type *Stenocorus strigosus* (Gyll.); *Hypomares*, p. 250, type *Corethrogaster brunneus* (Thoms.); *Allogaster*, p. 251, type *Corethrogaster geniculatus* (Dej.); *Prazitheæ*, p. 254, allied to *Torneutes*, type *Xestia thomsonii* (Chabrillac); *Cosmocerus* (Dej.), p. 260, allied to *Ceragenia*, type *C. strigosus* (Guér.); *Hylorus*, p. 261, allied to *Rosalia*, type *Chrysoprasis armatus* (Chabrillac); *Calydon*, p. 263, allied to *Callidium*, type *C. submetallicum* (Blanch.).

Pyrrhidium, Fairmaire, Gen. Col. Europe, p. 133. Allied to *Callidium*; mentum trapeziform, arched at the sides, membranous in front; lingua membranous, broadly and deeply emarginate, apparently furnished with a small ligula; prothorax nearly twice as broad as long, sides strongly angulate; prosternum produced into an acute process, but not separating the anterior coxæ. Type *P. sanguineum* (Linn.).

Pecidium, Fairmaire, l. c. p. 134. Allied to *Callidium*; eyes divided, the upper part smallest; palpi very short; antennæ much shorter than the body; prosternum forming an obtuse angle near anterior coxæ; prothorax rounded at the sides. Type *P. alni* (Linn.).

Caloclytus, Fairmaire, l. c. p. 145 = *Isotomus*, Muls., the latter name being previously employed in Coleoptera by Blanchard.

Conchopterus, Fairmaire, l. c. p. 153. Allied to *Molorchus*; head shorter and broader; eyes larger and more convex; antennæ more distant at base, shorter than body, first joint at least as long as third; posterior tarsi with first joint not longer than the following two united. Type *C. umbellatarum* (Linn.).

Pascoe, Journ. of Ent. ii. p. 234, proposes to separate his *Didymocantha cylindricollis* as a distinct genus, for which he proposes the name of *Lygesis*, g. n. It has the joints of the antennæ cylindrical, and is of an elongate form; the hairs are nowhere collected into masses so as to form well-defined spots.

Bebius, Pascoe, l. c. p. 235, a still narrower form, with slender, scattered, erect hairs, and differing from *Didymocantha*, *Isalium* (Pasc.), and *Lygesis* in having the basal joint of the antennæ nearly or quite twice as long as the third. Sp. *Bebius filiformis*.

Opsidota, Pascoe, l. c. p. 235. Allied to *Didymocantha* (Newm.). Antenniferous tubercles approximate at base. Eyes very large, strongly emarginate. Antennæ longer than the body; scape somewhat curved, equal to fourth joint and a little shorter than the third; rest nearly equal and longer, and, except the first and second, dilated on one side. Palpi short, thick. Prothorax smooth, rounded at the sides. Femora compressed. Sp. *O. infecta*, Pasc.

Taphos, Pascoe, l. c. p. 236. Referred by the author to the vicinity of *Cerambyx*, but presenting Prionidan characters. Head subexserted, very short in front; antenniferous tubercles distant. Eyes large, lunulated. Antennæ 11-jointed, longer than the body, smooth; scape short; second joint very short; the rest compressed, nearly equal, produced laterally at the apex, the last joint notched. Palpi incrassate. External lobe of maxillæ produced,

fringed. Prothorax broader than the head, even, toothed at the sides. Elytra broad and depressed, rounded at the apex. Anterior coxæ distant, globose. Posterior tarsi with the basal joint elongate-triangular. Prosternum elevated; mesosternum broad. Anterior acetabula narrowly angulated. Sp. *T. aterrimus*, Pasc.

Æbarina, Pascoe, l. c. p. 245. Resembling *Sophron* (Newm.) (= *Clæadne*, Pasc.), but with large facets to the eyes.

Zamium, Pascoe, l. c. p. 288. Allied to *Callidium*. Antenniferous tubercles wanting. Eyes with large facets. Antennæ compressed towards the apex; scape not thickened, about equal to third joint, fourth shorter than third, fifth longer than fourth. Femora incurved; tibiæ straight; tarsi slender, four posterior with basal joint elongated. Anterior coxæ small and approximate; anterior acetabula much angulated. Sp. *Z. incultum*, Pasc., &c.

New species :—

Pyrocalymma (g. n.) *pyrochroides*, Thoms. p. 160, from Darjeeling.

Plutonesthes (g. n.) *rufipennis*, Thoms. p. 160, from Malasia.

Artimpaza (g. n.) *odontoceroïdes*, Thoms. p. 161, from Malasia.

Cleomenes (g. n.) *dihammaphoroïdes*, Thoms. p. 161, from Mindanao.

Ischasia (g. n.) *rufina*, Thoms. p. 163, from Brazil.

Phygopoda (g. n.) *fugax*, Thoms. p. 164, from Brazil.

Pasiphyle (g. n.) *mystica*, Thoms. p. 164, from Brazil.

Isthmiade (g. n.) *hephestionoides*, Thoms. p. 166, from Brazil.

Mecosaspis (g. n.) *violacea*, Thoms. p. 172, from Grand Bassam.

Leontium (g. n.) *viride*, Thoms. p. 175, from Eastern Asia.

Oxyprosopus (g. n.) *jucundus* (Dej.), Thoms. p. 178, from the Senegal.

Helymæus (g. n.) *cyanipennis* (Dej.), Thoms. p. 180, from the Cape of Good Hope.

Brachysarthron (g. n.) *antennatum*, Thoms. p. 180, from Senegambia.

Zosterius (g. n.) *lætus* (Dej.), Thoms. p. 181, from the Cape of Good Hope.

Ideratus (g. n.) *cyanipennis*, Thoms. p. 183, from Columbia.

Clytosaurus (g. n.) *priapus*, Thoms. p. 190, from Malacca.

Pneumida (g. n.) *argenteofasciata*, Thoms. p. 191, from Malasia.

Calanthemis (g. n.) *myops*, (Chevr. MS.?), Thoms. p. 194, from the Cape of Good Hope.

Philagathes (g. n.) *lætus*, Thoms. p. 197, from Lake Ngami.

Eleanor (g. n.) *tragocephaloïdes*, Thoms. p. 198, from the Senegal.

Ischnocnemis (g. n.) *costipennis* (Dej.), Thoms. p. 199, from Mexico.

Muscidora (g. n.) *tricolor* (Chevr.), Thoms. p. 202, from Mexico.

Eburiola (g. n.) *erythrocephala*, Thoms. p. 203, from Jamaica.

Basiptera (g. n.) *castaneipennis*, Thoms. p. 205, from Mexico.

Lylibæum (g. n.) *ilium*, Thoms. p. 216, from Brazil.

Engyum (g. n.) *quadrinotatum* (Dej.), Thoms. p. 217, from Brazil.

Cycnidolon (g. n.) *equus*, Thoms. p. 217, from Brazil.

Phormesium (g. n.) *eudesmoides*, Thoms. p. 218, from Brazil.

- Hexoplon* (g. n.) *venus*, Thoms. p. 219, from Cayenne.
- Hysterarthron* (g. n.) *collare*, Thoms. p. 224, from Malasia.
- Tenthras* (g. n.) *obliteratus* (Dej.), Thoms. p. 225, from Cayenne.
- Antinoë* (g. n.) *bicolor*, Thoms. p. 226, from Cayenne.
- Thelxiope* (g. n.) *viridicyanea* (Dej.), Thoms. p. 226, from Brazil.
- Typodryas* (g. n.) *callichromoides*, Thoms. p. 227, from Silhet.
- Homalolachnus* (g. n.) *lacordairei*, Thoms. p. 232, from Malasia.
- Utopia* (g. n.) *castelnaudii*, Thoms. p. 233, from Malasia.
- Dymasius* (g. n.) *strigosus*, Thoms. p. 234, from India.
- Eligmoderma* (g. n.) *ibidionoides*, Thoms. p. 247, from Columbia.
- Comusia* (g. n.) *obriumoides*, Thoms. p. 250, from Mindanao.
- Nortia* (g. n.) *cavicollis*, Thoms. p. 252, from Mindanao.
- Thelgetra* (g. n.) *latipennis*, Thoms. p. 258, from Brazil.
- Deltosoma* (g. n.) *lacordairei*, Thoms. p. 258, from Cayenne.
- Ethemon* (g. n.) *lepidum*, Thoms. p. 262, from Mexico.
- Criocephalum epibata*, Schjödte, Nat. Tidsskr. 3rd ser. vol. ii.; Ann. & Mag. Nat. Hist. 3rd ser. vol. xv. p. 203; from Denmark.
- Phoracantha odewahnii*, Pasc. Journ. of Ent. ii. p. 231, *Ph. pedator*, Pasc. l. c. p. 232, *Ph. angasi*, Pasc. l. c. p. 233, and *Ph. balteata*, Pasc. ibid., from S. Australia; *Ph. grallaria*, Pasc. (l. c. p. 231), and *Ph. hospita*, Pasc. l. c. p. 232, from Queensland.
- Isalium odewahnii*, Pasc. l. c. p. 235, from S. Australia.
- Opsidota* (g. n.) *infecta*, Pasc. l. c. p. 236, pl. 11. fig. 6, from Australia.
- Taphos* (g. n.) *aterrimus*, Pasc. l. c. p. 236, pl. 11. fig. 7, from S. Australia.
- Ceresium* ? *modestum*, Pasc. l. c. p. 237, from S. Australia.
- Obrium dorsale*, Pasc. l. c. p. 237, and *Obrium tripartitum*, Pasc. l. c. p. 238, from S. Australia.
- Phacodes ferrugineus*, Pasc. l. c. p. 238, from S. Australia.
- Agapete kruesleri*, Pasc. l. c. p. 241, from S. Australia.
- Promeces iris*, Pasc. l. c. p. 288. Habitat not stated (S. Africa?).
- Zamium* (g. n.) *incultum*, Pasc. l. c. p. 289, from Natal; *Z. succineum*, Pasc. ibid., and *Z. prociuum*, Pasc. ibid., from the Cape of Good Hope.
- Hammaticherus pfisteri*, Stierlin, Berl. ent. Zeitschr. 1864, p. 152, from Sicily.
- Phyllocnema mirifica*, Pasc. l. c. p. 286, pl. 13. fig. 4, from Natal.
- Xystrocera erosa*, Pasc. l. c. p. 287, and *Xystrocera juvenca*, Pasc. ibid. note, both from Natal.
- Euporus ignicollis*, Pasc. l. c. p. 287, and *Euporus callichromoides*, Pasc. l. c. p. 288, from Natal.
- Callichroma levigata*, Philippi, Stett. ent. Zeit. 1864, p. 376, from Chili.
- Hephæstion*. Six new Chilian species are described by Philippi, Stett. ent. Zeit. 1864: *Hephæstion cyanopterus*, l. c. p. 377; *H. flavicornis*, l. c. p. 378; *H. inpterus*, ibid.; *H. corralensis*, l. c. p. 379; *H. holomelas*, ibid.; *H. fuscescens*, ibid.
- Callisphyrus schythei*, Philippi, l. c. p. 380, and *C. annulata*, Phil. ibid., from Chili.

Platynocera annulata, Philippi, l. c. p. 381, from Chili.

Callideryphus collaris, Philippi, l. c. p. 382, and *C. niger*, Phil. l. c. p. 383, from Chili.

Callidium siculum, Stierlin, l. c. p. 152, from Sicily.

Clytus heydeni, Stierlin, l. c. p. 152, from Sicily; *C. bruckii*, Kraatz, Berl. ent. Zeits. 1864, p. 389, taf. 4. fig. 1, from Mount Olympus.

Xylocharis hæmaticus, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 271, and *X. flavocomus*, Fairm. l. c. p. 292, from Mendoza.

Ibidion spinicornis, Fairmaire, l. c. p. 274, from Mendoza.

Prionides.

New genera:—

THOMSON (Syst. Ceramb.) characterizes the following new genera of this subfamily:—

Otiartes, p. 283, allied to *Prionus*, type *P. asiaticus* (Fald.); *Hephialtes*, p. 285, allied to *Orthosoma*; *Tithoes*, p. 289, allied to *Acanthophorus*, type *Prionus maculatus* (Fab.); *Pithocles*, p. 291, allied to *Derochrachus*, type *D. procerus* (Thoms.); *Xizuthus*, p. 296, allied to *Ancistrotus*, type *Macrotoma microcerus* (White); *Ialyssus*, p. 296, allied to *Ctenoscelis*, type *Prionus tuberculatus* (Oliv.); *Agrianome*, p. 300, allied to *Macrotoma*, type *Mallodon fairmairei* (Montrouzier); *Arimaspes*, p. 301; *Dioclides*, p. 302; *Eurynassa*, p. 303; *Teispes*, p. 305; *Opheltes*, p. 306, allied to *Mallodon*.

Apterocaulus, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 267. Nearly allied to *Prionacalus* (White). Head narrow, unarmed at the sides. Mandibles short, stout. Last joint of max. palpi securiform in ♂, dilated and rounded in ♀. Antennæ short. Elytra shorter than abdomen, especially in ♀; wings none. Prothorax trispinose on each side. Sp. *A. germainii*, Fairm.

New species:—

Hephialtes (g. n.) *tricostatus* (Chevr. MS.), Thoms. 286, from Brazil.

Arimaspes (g. n.) *howei*, Thoms. p. 302, from Australia.

Dioclides (g. n.) *prionides*, Thoms. p. 303, from Adelaide.

Eurynassa (g. n.) *servillei*, Thoms. p. 304, from N. Australia.

Teispes (g. n.) *dorsalis*, Thoms. p. 305, from N. Australia.

Opheltes (g. n.) *auriculatus*, Thoms. p. 306, from New Caledonia and the New Hebrides.

Mallodon odewahnii, Pasc. l. c. p. 242, from S. Australia; *Mallodon cephalotes*, Pasc. l. c. p. 242, from Queensland; and *Mallodon jejenum*, Pasc. l. c. p. 243, from Richmond River.

Catypnes (g. n. not charact.) *macleayi*, Pasc. l. c. p. 244. Allied to *Mallodon* and *Macrotoma*.

Macrotoma papyria, Pasc. l. c. p. 244, from South (?) Australia.

Apterocaulus germainii, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 268, pl. 6. fig. 1, and *A. marginipennis*, Fairm. l. c. p. 270, from Mendoza.

Calocomus coriaceus, Fairmaire, l. c. p. 270, from Mendoza.

PHYTOPHAGA.

General remarks :—

MARSHALL has commenced (Ann. & Mag. Nat. Hist. 3rd ser. vol. xiii. p. 380 *et seq.*) a revision of the *Eumolpidæ*, which, however, has not yet been continued. He remarks on the difficulties attending the investigation of this group, and indicates that these are more especially due to the imperfect manner in which the published genera and species have been characterized. Out of 59 genera indicated in the group by Chevrolat in Dejean's Catalogue only 19 have been characterized, and 7 of these insufficiently. The author gives a detailed character of Chevrolat's genus *Metazyonycha* (*Metazyonycha*, Chevr.), of which 4 species have already been described, viz., *4-maculata* (Oliv.), *granulata* (Germ.), *chloroptera* (Germ.), and *testacea* (Fab.). The characters of these species, and of 10 others, including *M. tricolor* (Perty), are given by Marshall in a tabular form, and the new species are described in detail.

MARSHALL has published (Proc. Linn. Soc. vol. viii. pp. 24–50) a revision of the genera allied to *Corynodes* (Hope), which he regards as forming a subfamily, *Corynodina*, of the *Eumolpidæ*. He gives the following character of the group and synopsis of its constituent genera (*l. c.* p. 29):—

CORYNODINA. Antennæ extrorsum plus minus incrassatæ s. dilatæ, corpore breviores: thorax cylindricus lateribus marginatus, verticem supra occultans, plerumque post oculos utrinque sinuatus: corpus oblongum, convexum: pedes robusti, tibiis canaliculatis, extus apice angulatim productis; unguiculis bifidis s. appendiculatis.

† Antennæ distincte clavatæ; clavæ articulis, numero 5–7, compresso-dilatatis.

* Articulo ultimo apice late obtuso, rotundato. . . *Corynodes* (Hope).

** Articulo ultimo apice acuminato *Acrothinium* (g. n.).

†† Antennæ haud clavatæ, interdum leviter extus incrassatæ, articulis nec valde compressis, nec dilatatis.

* Mandibulæ simplices *Chrysochares* (Morav.).

** Mandibulæ bidentatæ *Chrysochus* (Redt.).

The species, 67 in number, are chiefly Asiatic, and this is especially the case with the numerous forms belonging to the first two genera. The second group is represented in Europe, Asia, and North America, but no species of it are known from Africa or S. America. The African species of *Corynodes* (including *Platycorynus*, Chevr.) are distinguished from the Asiatic by their longer thorax, narrowed in front, and their more narrowly oblong elytra.

Corynodes is divided by Marshall (*l. c.*) into seven subgenera: *Platycorynus* (Chevr. nec Baly), p. 31; *Corynodes*, p. 34; *Theumorus*, (Marsh.) p. 35; *Eurycorynus* (Marsh.), p. 36; *Omodon* (Marsh.), p. 44; *Erigenes* (Marsh.), p. 45; and *Bathycolpus* (Marsh.), p. 46.

Notes on known genera and species:—

Suffrian describes a *Donacia* from Celebes, which he identifies with *D. javana* (Wied.), a species unknown to Lacordaire. Stett. ent. Zeit. 1864, p. 86.

Zeugophora turneri (Power) is figured and described by Rye, Ent. Ann. 1864, p. 70, fig. 8.

According to Philippi (Stett. ent. Zeit. 1864, p. 388), *Cryptocephalus chilensis* and *elegans* (Blanch.) are the two sexes of the same species.

Dohrn states (Stett. ent. Zeit. 1864, p. 195) that *Cryptocephalus æneus* (Stierl.) is identical with *C. lateralis* (Suffr.); *Pachybrachys astragali* (Stierl.) = *P. vermicularis* (Suffr.).

According to Suffrian (Stett. ent. Zeit. 1864, p. 265), *Cryptocephalus brachialis* (Muls.) = *C. populi* (Dahl); and *C. raphaelensis* (Gautier) = *C. politus* (Suffr.).

Cryptocephalus beckeri (Dohrn, MS.), Suffrian, Stett. ent. Zeit. 1864, p. 265, from Sarepta, = *C. elegans* (Becker, MS.) = *C. ergenensis* (Morawitz). The last-mentioned name has the priority.

Kraatz has published (Mittheil. Schweiz. ent. Ges. 1864, p. 205) some remarks on the specific identity or dissimilarity of several species of *Oreina*, with especial reference to *O. nigriceps* and *O. peirolerii*.

HAMLET CLARK remarks (Ann. & Mag. N. H. 3rd ser. vol. xiv. p. 115) that the genus *Polysticta* (Hope) includes the uncharacterized genera *Atechna* and *Centroscelis* (Chevr. in Dej. Cat.), between which there is no real difference. Clark refers 36 species to the genus *Polysticta* as defined by him, 30 of which are described by him, or indicated by their synonymy, in the paper above cited. The previously described species are: *P. striata* (Fab.); *24-signata* (Thunb.); *clarkii* (Baly), described in 1864; *14-guttata* (Fab.); *10-pustulata* (Thunb.); *notata* (Fab.); and *vulpina* (Fab.). Undescribed but previously named species are *P. macularis*, *20-guttata*, *multifida*, *figurata*, and *clathrata* (Dej. Catalogue), and *P. nigro-signata* (Bohem.).

Perris states that *Chrysomela carbonaria* (Suffr.) is identical with *C. (Timarcha) pyrenaica* (L. Duf.). Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 310.

Baly (Journ. of Ent. ii. pp. 291-2) characterizes Olivier's genus *Paropsis*, and has some observations on the geographical distribution and synonymy of the species. Of species of other authors he describes *P. variolosa*, Marsh. (l. c. p. 293); *P. reticulata*, Marsh. (l. c. p. 299); *P. atomaria*, Marsh. (l. c. p. 300); *P. maculata*, Marsh. (l. c. p. 301); *P. marmorea*, Oliv. (l. c. p. 302); *P. lutea*, Marsh. (l. c. p. 304); *P. obsoleta*, Oliv. (l. c. p. 309); and *P. porosa*, Erichs. (l. c. p. 310).

Arsipoda (Erichs.). Baly has published a revised character of this genus, and given a tabular synopsis of the Australian species, fourteen in number, nine of which were previously described, namely, *A. variegata* (Waterh.), *ovata* (Wat.), *attenuata* (Wat. + ♀ *substriata*, Wat.), *crassicornis* (Wat.), *nitida* (Wat.), *bifrons* (Erichs.), *bicolor* (Wat.), *consuta* (Germ.), and *chrysis* (Oliv.). Ann. & Mag. N. H. 3rd ser. vol. xiv. pp. 438, 439.

Hamlet Clark has characterized Chevrolat's genus *Schematiza* (Ent. Trans. vol. ii. p. 259), and described the following known species: *S. lycoides* (Guér.), l. c. p. 260; *S. frenata* (Guér.), p. 264; and *S. flavofasciata* (Guér.), ibid. He states that *S. dimidiata* (Guér.), described as from New Guinea, can hardly belong to this genus, the species of which are exclusively South American (l. c. p. 264).

Philippi states that *Galleruca decorata* and *ianthina* (Blanch.) belong to *Haltica*. Stett. ent. Zeit. 1864, p. 394.

Aphthona nigriceps. Rye describes British specimens of this species, which has lately been taken in this country. Ent. M. Mag. vol. i. p. 117.

Cornelius has described the larva and metamorphosis of *Haltica oleracea* (Fab.). Stett. ent. Zeit. 1864, pp. 98, 99.

Frauenfeld describes some characters of the larva of *Argopus hemisphaericus* (Duft.), which is found feeding upon various species of *Clematis*, but does not attack *C. vitalba*. Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 686.

Frauenfeld describes the larva of *Dibolia rugulosa* (Redt.), which is similar to those of *Argopus*. The larva mines the leaves of *Salvia sylvestris* (Lin.) the pupa was not observed. Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 692.

Criocerides.

New genera and species:—

Pedrillia, g. n., Westw. Ent. Trans. 3rd ser. vol. ii. p. 280. Nearly allied to *Temnaspis*, but shorter and stouter. Elytra convex behind. Pronotum much constricted behind the middle. Antennæ elongated; joints gradually thickened from the third, but not serrated. Last joint of max. palpi conical. Labium truncated. Posterior femora thickened, not spinose; tibiæ curved. Claws much dilated at base. Sp. *P. longicornis*, Westw., sp. n., from Bombay.

Sagra mutabilis, Baly, Ann. & Mag. N. H. 3rd ser. vol. xiv. p. 433, from Cambodia and Siam; *S. livingstonii*, Baly, l. c. p. 34, from the Zambesi.

Mecynodera balyi, Clark, Journ. of Entom. ii. p. 248, and Westw. Ent. Trans. 3rd series, vol. ii. p. 271, from Australia.

Orsodacna grandis, Philippi, Stett. ent. Zeit. 1864, p. 385, from Chili.

Psathyrocerus. Philippi describes four new Chilian species of this genus: *P. nigripes*, l. c. p. 383; *P. valdivianus*, l. c. p. 384; *P. rufus*, ibid.; *P. flavescens*, l. c. p. 385.

Ametalla W-nigra, Westw. l. c. p. 272, from Swan River.

Pacilomorpha. Westwood has described nine new species of this genus: namely, *Pacilomorpha westermanni*, l. c. p. 272, from Guinea; *P. balyana*, ibid., from South Africa; *P. luteipennis*, l. c. p. 273, from Sierra Leone; *P. gerstaeckeri*, ibid., from Java; *P. lacordairii*, ibid., *P. parvula*, *P. murina*, *P. calabarica*, l. c. p. 274, and *P. variabilis*, l. c. p. 275, from Old Calabar.

Pacilomorpha thoreyi, Baly, Ann. & Mag. N. H. 3rd ser. vol. xiv. p. 436, from Old Calabar.

Donacia lacordairii, Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 300, from Spain.

Crioceris nigropicta, Woll. Cat. Can. Col. p. 394, from Canary.

Crioceris fusco-maculata, Clark, Journ. of Entom. ii. p. 249, and *Crioceris multipunctata*, Clark, l. c. p. 249, both from New South Wales.

Lema gravida, Baly, Ent. Trans. 3rd ser. vol. ii. p. 223, from Port Natal.

Temnaspis. Five new species of this genus are described by Westwood : *Temnaspis arida*, l. c. p. 275, from Borneo ; *T. cunningii* (Hope, MS.), l. c. p. 276, from Manilla ; *T. chrysopyga*, ibid., from Old Calabar ; *T. bengalensis*, ibid., from Bengal ; and *T. lugubris*, l. c. p. 277, from Madagascar.

Temnaspis mouhoti, Baly, Ann. & Mag. N. H. 3rd ser. vol. xiv. p. 435, from Cambodia.

Leucastea. Westwood has described five species of this genus : *Leucastea rubridipennis*, l. c. p. 277, from Natal ; *L. concolor*, l. c. p. 278, from Natal and the Zulu country ; *L. atripennis*, ibid., from Old Calabar ; *L. dimidiata*, l. c. p. 279, from Natal ; *L. westermanni*, ibid., from Guinea ; *L. antica*, ibid., from Natal ; and *L. ephippiata*, l. c. p. 280, from W. Africa.

Chrysomelides.

New genera :—

Iphimeis, Baly, Ent. M. Mag. vol. i. p. 133. Allied to *Colaspis* ; body broadly ovate, convex ; antennæ subfiliform, last five or six joints slightly thickened and compressed ; suture between prosternum and epimera obsolete, prosternum truncate at base, epimera not reaching anterior angle of thorax ; claws appendiculate. Sp. *I. fulvipes*, Baly.

Colaspoides (Laporte, MS. ?), Baly, l. c. p. 134. Resembles preceding, but has a sutural groove between the prosternum and its epimera. Sp. *C. limbata* (Oliv.).

Acrothinium, Marshall, Proc. Linn. Soc. vol. viii. p. 47. For characters see table, p. 444. Type *Chrysochus gaschkevitchii* (Motsch.).

Clisithera, Baly, Journ. of Ent. vol. ii. p. 220. Body narrow-oblong, parallel, convex. Head perpendicular ; antennæ robust, compressed, attenuated at base and apex ; eyes scarcely sinuated within. Thorax transverse, as wide as the elytra, sides margined. Legs robust, simple. Claws appendiculate. Prosternum elongate, much dilated behind, anterior margin continuous with the epimera ; anterior epimera trapeziiform, outer anterior angle not produced to the angle of the thorax. Sp. *C. nigricornis*, Baly.

Chrysodina, Baly, loc. cit. p. 221. Ovate, convex. Head nearly immersed in thorax, perpendicular, produced below ; antennæ short, robust, last five joints forming a slender club ; mentum quadrato-emarginate. Thorax transverse, nearly equal at base to elytra ; elytra obsoletely lobed at the base, with an inflexed, oblique limb. Legs and claws as in preceding. Prosternum continuous with the margin of the epimera at the apex, truncate at base ; anterior epimera transverse ; outer anterior angle produced to the angle of the thorax. Sp. *C. igneicollis*, Baly.

Lepronida, Baly, loc. cit. p. 221. Oblong, convex ; back elevato-tuberculate. Head almost immersed ; antennæ slender, nearly filiform ; mentum concavo-emarginate. Thorax gibbous above, irregularly dentate at the sides. Elytra tuberculate. Legs robust ; tibiæ curved, compressed ; claws appendiculate. Prosternum nearly square, continuous at the apex with the

margin of the epimera; anterior epimera trapeziiform, outer anterior angle scarcely produced. Sp. *L. batesii*, Baly.

Corycia, Baly, *loc. cit.* p. 221. Elongate or oblong, convex. Head perpendicular, nearly concealed by the produced thorax; antennæ filiform; mentum quadrato-emarginate. Thorax transverse, sides rounded, entire, or obsoletely angulate. Elytra parallel, irregularly punctate-striate. Legs simple; claws appendiculate. Prosternum concavo-emarginate at base, at the apex continuous with the margin of the epimera; anterior epimera trapeziiform, outer anterior angle not produced to angle of thorax. Sp. *C. funesta*, Baly.

Cychreus, Baly, *loc. cit.* p. 222. Oblong or subelongate, convex. Head exerted, perpendicular; antennæ filiform; mentum quadrato-emarginate. Thorax narrower than the elytra, sides rounded, entire, not sloping, anterior margin not produced. Elytra parallel, irregularly punctate-striate. Legs and claws as in preceding. Prosternum deeply emarginate at base, bilobed, continuous in front with the epimera; anterior epimera as in preceding. Sp. *C. histrio*, Baly.

Eriphyle, Baly, *loc. cit.* p. 222. Antennæ with the five apical joints slightly dilated, forming an indistinct club. Thorax scarcely narrower than the elytra, narrowed towards the apex. The other characters as in preceding. Sp. *E. unimaculata*, Baly.

Platycorynus, Baly, *New Genera, &c.* p. 2. Nearly allied to *Corynodes* (Hope); antennæ robust, with the last five joints compressed, more or less dilated, forming a club; eyes placed in a large pit; claws appendiculate or dentate. Twenty-seven new species.

Dematochroma, Baly, *New Genera, &c.* p. 16. Oblong-elongate; head exerted; antennæ robust, attenuated at apex, joints compressed; thorax transverse; elytra scarcely broader than thorax; tibiæ canaliculate externally; claws appendiculate. Sp. *D. picea*, Baly.

Xanthopachys, Baly, *New Genera, &c.* p. 16. Body rotundate-ovate, very convex; head inserted in the thorax; antennæ short, last five joints forming a compressed club; thorax transverse, margined; legs robust, thighs thickened, tibiæ curved, tarsi broad, with the first joint short, claws appendiculate. Prosternum continuous with the margin of the epimera, anterior epimera trapeziiform, outer anterior angle not produced to the angle of the thorax. Sp. *X. nigripes*, Baly.

Marsæus, Clark, *Journ. of Ent.* vol. ii. p. 252. Nearly allied to *Rhyparida* (Baly), but less elongate, with the margins of the thorax rotundate or rotundato-angulate. Differs from *Febra* in the subquadrate thorax and the more arched elytra, of which the margins scarcely reach to the shoulders. Type, *Cryptocephalus didymus*, Fab.

Damelia, Clark, *l. c.* p. 255. Closely allied to *Busilepta* (Baly), but the antennæ are robust, the legs elongated and robust, with no teeth on the femora; intermediate and posterior tibiæ with a short spine near the apex. Sp. *D. marshalli*, Clark.

New species:—

Clythra (*Diapromorpha*) *walleri*, Baly, *Ent. Trans.* 3rd ser. vol. ii. p. 224, from the Zambesi.

- Clythra (Peploptera) tibialis*, Baly, *ibid.*, from Port Natal.
- Cryptocephalus nitidicollis*, Woll. Cat. Can. Col. p. 397, and *C. puncticollis*, Woll. *l. c.* p. 398, from the Canaries; *Cryptocephalus aeneus*, Stierlin, Bull. Soc. Nat. Mosc. 1863, p. 499, from Sarepta—allied to *C. marginellus*.
- Pachybrachys astragali* (Becker), Stierlin, *l. c.* p. 500, from Sarepta.
- Stylosomus biplagiatus*, Woll. *l. c.* p. 399, from Fuerteventura.
- Chlamys picta*, Philippi, Stett. ent. Zeit. 1864, p. 386, and *C. minuta*, Phil. *l. c.* p. 387, from Chili.
- Eumolpus ? valdivianus*, Philippi, *l. c.* p. 388, from Chili.
- Myochrous quadridentatus*, Philippi, *l. c.* p. 389, and *M. terrosus*, Phil. *l. c.* p. 390, from Chili.
- Noda splendida*, Philippi, *l. c.* p. 390, from Chili.
- Bromius philippinensis*, Baly, Journ. of Entom. vol. ii. p. 219, from the Philippines; *B. hebe* from Siam, *evanescens* from Penang, and *bohemani* from Port Natal, Baly, *l. c.* p. 220. (Baly adopts Chevrolat's name *Bromius* for Stål's genus *Calomorpha*, the latter being previously employed in Lepidoptera.)
- Chrysolampra mouhoti*, Baly, *l. c.* p. 220, from Siam.
- Corynodes hopei*, Baly, New Genera, &c., p. 7, from the Philippine Islands.
- Corynodes*. Marshall (*l. c.*) has described the following new species of this genus: *C. simillimus*, p. 32, from the Gold Coast; *C. lautissimus*, p. 33, from the Gaboon; *C. pusio*, *ibid.*, from Lake Ngami; *C. ianthinus*, p. 35, of unknown origin; *C. amethystinus*, *ibid.*, habitat unknown; *C. flosculus*, p. 37, from Cambodia; *C. fulgurans*, p. 40, from Ceram; *C. ampullatus*, p. 41, from Java; *C. malachiticus*, p. 42, from India; *C. hyacinthinus*, *ibid.*, from Java; *C. suaveolus*, *ibid.*, from Manilla; *C. asphodelus*, p. 43, from Nepal; *C. speculum*, *ibid.*, from Java; *C. chalybeus*, p. 44, from Cambodia and Burmah; and *C. circumductus*, p. 46, from India.
- Chrysochus mouhoti*, Baly, *l. c.* p. 222, from Siam; *C. pulcher*, Baly, New Genera, &c., p. 1, from Malacca.
- Chrysochus californicus*, Marshall, *l. c.* p. 49, *C. tenebricosus*, Marsh. *ibid.*, and *C. castaneus*, Marsh. *ibid.*, from California.
- Iphimeis* (g. n.) *fulripes*, Baly, Ent. M. Mag. vol. i. p. 134, from Brazil.
- Scelodonta*. Baly has described (New Genera, &c.), *Scelodonta pulchella*, *l. c.* p. 1, and *S. purpureomaculata*, *ibid.*, from Celebes; and *S. nitidula*, *l. c.* p. 2, from Borneo.
- Pseudocolaspis divisa*, Woll. Cat. Can. Col. p. 394, and *P. dubia*, Woll. *l. c.* p. 395, from the Canaries.
- Metazyonycha*. Marshall describes the following new species of this genus: *M. connea*, Ann. & Mag. Nat. Hist. 3rd ser. vol. xiii. p. 384, from Brazil; *M. crucifera*, *l. c.* p. 385, from Mexico; *M. chlorospilota*, *ibid.*, from S. America?; *M. humilis*, *l. c.* p. 386, and *M. humeralis*, *l. c.* p. 387, from the Amazons; *M. quadrimaculata* (Dej. Cat.), *l. c.* p. 387, *M. tetrasticta*, *l. c.* p. 388, and *M. tejucana*, *ibid.*, from Brazil; *M. amasia*, *l. c.* p. 388, from Costa Rica.
- Dermorhytis ornatissima*, Baly, New Genera, &c., p. 8, from Ceylon; *Dermorhytis elegans*, Baly, *ibid.*, from Malacca.
- Rhyparida*. Of this genus Baly has described 19 new species (New 1864. [VOL. I.] 2 G

Genera, &c.): namely, *Rhyparida sulcata*, l. c. p. 8, and *R. fulva*, l. c. p. 11, from Borneo; *R. tristis*, p. 8, *R. dimidiatipennis*, ibid., *R. nigro-ænea*, p. 9, *R. trilineata*, ibid., *R. nigripennis*, p. 10, and *R. femorata*, p. 10, from New Guinea; *R. regularis*, p. 9, *R. fasciata*, p. 10, from Dorey and New Guinea; *R. dorsata*, p. 8, *R. limbata*, p. 9, *R. pascoei*, p. 10, from Celebes; *R. alternata*, p. 9, from Gilolo; *R. vittipennis*, p. 9, from Flores; *R. fulviceps*, p. 10, from Tondano; *R. sordida*, p. 10, and *R. impuncticollis*, p. 11, from Batchian; and *R. inconstans*, p. 10, from Batchian and Ternate.

Rhyparida nitida, Clark, Journ. of Ent. ii. p. 252, from New South Wales.

Callisina quadripustulata, Baly, New Genera, &c., p. 11, from Java; *Callisina mouhoti*, Baly, ibid., from Cambodia.

Chrysopida regalis, Baly, New Genera, &c., p. 11, from Morty Island.

Nodostoma. Of this genus 13 new species are described by Baly, New Genera, &c., pp. 12-14: namely, *Nodostoma viridiænea*, p. 12, *N. foveicollis*, ibid., and *N. nigricornis*, p. 13, from Tondano; *N. nigripes*, p. 12, from Sumatra; *N. scabrosa*, p. 12, *N. costata*, ibid., *N. cylindrica*, p. 13, *N. pallida*, ibid., and *N. bohemani*, p. 14, from Borneo; *N. semivittata*, p. 13, from India; *N. evanescens*, p. 13, from New Guinea; *N. jansoni*, ibid., from Singapore; and *N. cunningii*, p. 14, from Manilla.

Colasposoma. Baly (New Genera, &c.) describes five species of this genus: namely, *Colasposoma inconstans*, l. c. p. 14, from Celebes; *C. aureo-vittatum*, ibid., and *C. pulcherrimum*, p. 15, from India; *C. gratiosum*, p. 15, from Singapore; and *C. abdominale*, ibid., from Lake N'Gami.

Pyropida. Baly (New Genera, &c.) describes the following four species of this genus: *Pyropida lateralis*, l. c. p. 15, from New Guinea; *P. biplagiata*, ibid., from Batchian; *P. elegantula*, ibid., from Amboina; and *P. nigrocærulea*, p. 16, from Ceram.

Platycorynus (g. n.). The following species are described by Baly: *Platycorynus costatus*, *P. longicornis*, New Genera, &c., p. 2, *P. cunningii*, *P. congener*, p. 3, and *P. waterhousii*, p. 4, from Manilla; *P. marshalli*, l. c. p. 2, from Gilolo; *P. tuberculatus*, l. c. p. 3, and *P. æneus*, p. 5, from Sarawak; *P. robustus*, l. c. p. 3, from Sumatra; *P. mutabilis*, ibid., from Menado, Sumatra, and Ceram; *P. fabricii*, l. c. p. 4, *P. fraternus*, p. 5, and *P. approximans*, p. 6, from Sumatra; *P. biseriatus*, l. c. p. 4, from Macassar; *P. dohrnii*, l. c. p. 4, from Ceylon; *P. pretiosus*, ibid., and *P. sheppardi*, p. 7, from India; *P. stevensi*, l. c. p. 5, from Tondano and Menado; *P. elegantulus*, ibid., from Celebes; *P. perplexus*, ibid., *P. fasco-æneus*, p. 6, and *P. parvulus*, p. 7, from Singapore; *P. cupreus*, *P. cælestinus*, p. 6, from Malacca; *P. ignitus*, ibid., from Penang; *P. mouhoti*, p. 7, from Cambodia; and *P. gratiosus*, ibid., from Rangoon.

Platycorynus parryi, Baly, Journ. of Ent. vol. ii. p. 223, from China.

Clisithera (g. n.) *nigricornis*, Baly, Journ. of Ent. ii. p. 221, from the Amazons.

Chrysodina (g. n.) *igneicollis*, Baly, l. c. p. 221, from Ega.

Lepronida (g. n.) *batesii*, Baly, l. c. p. 221, from the Amazons.

Corycia (g. n.) *funesta*, Baly, l. c. p. 221, from the Amazons.

Cychrea (g. n.) *histrio*, Baly, l. c. p. 222, from the Amazons.

Eriphyle (g. n.) *unimaculata*, Baly, l. c. p. 222, from the Amazons.

Dematochroma (g. n.) *picea*, Baly, New Genera, &c., p. 16, from New Caledonia.

Xanthopachys (g. n.) *nigripes*, Baly, l. c. p. 16, from the Amazons.

Marsæus (g. n.). Clark describes the following new species (Journ. of Ent. vol. ii.): *Marsæus nigro-cyaneus*, l. c. p. 253, *Marsæus rufus*, l. c. p. 253, *Marsæus ruficollis*, l. c. p. 254, from New South Wales; *Marsæus simplex*, ibid., from North Australia; *Marsæus rufo-flavus*, l. c. p. 255, from "New Holland"; and *Marsæus flavus*, ibid., from New South Wales.

Damelia (g. n.) *marshalli*, Clark, l. c. p. 256, from the Fiji Islands.

Gynandrophthalma æneopicta, Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 646, from Algeria.

Chrysomela nitida, Philippi, l. c. p. 391, *C. obscura*, Phil. l. c. p. 392, and *C. ? quadristriata*, Phil. ibid., from Chili.

Chrysomela luteocincta, Fairm. l. c. p. 647, from Algeria.

Chrysomela numida, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 245, from Algeria; *Chrysomela fortunata*, Woll. Cat. Can. Col. p. 402, from Palma; *C. rutilans*, Woll. ibid., from Gomera.

Chrysomela pallida, Bland, Proc. Ent. Soc. Phil. vol. iii. p. 71, from the Colorado Territory.

Chrysomela (Atechna) clarkii, Baly, Ent. Trans. 3rd ser. vol. ii. p. 227, from the Zambesi.

Australica (Stethomela) parryi, Baly, l. c. p. 227, from Australia.

Australica pyrrhocephala and *Australica paropsoides*, Clark, Journ. of Ent. vol. ii. p. 251, from New South Wales.

Chalcomela pilula, Clark, l. c. p. 251, pl. 12. fig. 4, from Swan River and New South Wales.

Doryphora salvinii, Baly, l. c. p. 225, from Panama.

Ceralces walleri, Baly, l. c. p. 226, and *C. spilota*, Baly, ibid., both from the Zambesi.

Chalcolampra verrucosa, Clark, Journ. of Ent. ii. p. 250, pl. 12. fig. 2, from Australia.

Gonioctena murrayii, Baly, l. c. p. 228, from Old Calabar; and *G. fortunei*, Baly, ibid., from North China.

Gastrolina thoracica, Baly, l. c. p. 228, from Japan.

Lina adamstii, Baly, l. c. p. 229, from Chusan.

Lina rubricollis, Philippi, l. c. p. 391, from Chili.

Polysticta (Hope). Clark describes the following new species of this genus from South Africa (Ann. & Mag. N. H. 3rd ser. vol. xiv.): *Polysticta nigro-signata* (Bohem.), l. c. p. 116; *P. subcruciata*, l. c. p. 117; *P. eburnipennis* (Chev.), l. c. p. 118; *P. macularis* (Dej.), l. c. p. 119; *P. nigro-fasciata*, l. c. p. 120; *P. pulchella*, ibid.; *P. lævigata*, ibid.; *P. nigro-ænea*, l. c. p. 121; *P. nigra*, ibid.; *P. marshalli*, ibid.; *P. picturata* (Chev.), l. c. p. 122; *P. lineolata*, l. c. p. 123; *P. soluta* (Dej.), ibid.; *P. 20-guttata*, l. c. p. 169; *P. 20-maculata*, ibid.; *P. modesta*, l. c. p. 170; *P. multifida* (Chev.), l. c. p. 171; *P. consimilis*, l. c. p. 172; *P. figurata*, ibid.; *P. clathrata* (Dej.), l. c. p. 173; *P. hebe*, ibid.; and *P. flavo-sparsa*, l. c. p. 174.

Phædon ignitum, Reiche, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 246, from Algeria; *P. menthae*, Woll. l. c. p. 404, from the Canaries.

Phædon ? rubripes, Philippi, l. c. p. 390, from Chili.

Plagioder a celestina, Baly, Ent. Trans. 3rd ser. vol. ii. p. 229, from Hong Kong; and *P. cuprea*, Baly, ibid., from Lake N'Gami.

Paropsis purpureo-viridis, Clark, Journ. of Ent. ii. p. 250, from Northern Australia.

Paropsis. Baly describes the following new species of this genus: *P. tasmanica*, Journ. of Ent. ii. p. 294, from Tasmania; *P. lownei*, l. c. p. 294, from Sydney; *P. wilsoni*, l. c. p. 295, *P. waterhousei*, l. c. p. 296, *P. fulvoguttata*, l. c. p. 298, *P. geographica*, l. c. p. 303, *P. consimilis*, l. c. p. 306, *P. pingua*, ibid., *P. carnosa*, l. c. p. 307, and *P. roseola*, l. c. p. 308, from Adelaide; *P. parryi*, l. c. p. 296, probably from Northern Australia; and *P. suspiciosa*, l. c. p. 297, from Melbourne.

Gallerucides.

New genera :—

Menippus, Clark, Journ. of Ent. ii. p. 257. Closely allied to *Galleruca*, but broader and shorter; tibiae shorter; claws bifid at the apex. Sp. *M. cynicus*, Clark.

Rupilia, Clark, l. c. p. 260. Allied to *Metalepta* (Baly) and *Galleruca*. Thorax with the sides rounded; elytra subparallel in the ♂, not covering the whole body in the ♀; claws slightly appendiculate. Sp. *R. ruficollis*, and *R. viridi-cenea*, Clark.

Eratosthenes, Clark, l. c. p. 261. Allied to *Crepidodera*. Thorax equal in width to the elytra, with a basal transverse furrow, abbreviated on each side. Posterior femora with an acute tooth beneath near the apex; posterior tibiae longitudinally carinate, and somewhat curved. Sp. *E. flavus*, Clark.

Febra, Clark, l. c. p. 261. Forehead strongly angulated or produced, forming a process on which the antennae are inserted. Antennae very long, twice as long as the whole body; basal joint incrassated towards the apex; second joint short; terminal joint much elongated, slightly inflexed at the apex. Sp. *F. venusta*, Clark.

Chthoneis, Baly, Ent. M. Mag. vol. i. p. 135. Allied to *Laperus*; antennae with first three joints short, remainder elongate, dilated, compressed. Sp. *C. apicicornis*, sp. n., Baly, p. 136, from Columbia.

Byblitea, Baly, l. c. p. 136. Allied to *Diabrotica*; hinder tibiae unarmed at the apex. Sp. *B. deyrollei*, sp. n., Baly, from Columbia.

Clitena, Baly, Ent. Trans. 3rd ser. vol. ii. p. 229. Nearly allied to *Galleruca*, but having all except the first three joints of the antennae dilated and compressed. Sp. *C. limbata*, Baly, &c.

Laphris, Baly, l. c. p. 231. Allied to *Aplosomyza*, but distinguished by having the claws appendiculate and the metasternum produced forward beyond the intermediate coxae. Sp. *L. emarginata*, Baly.

Lætana, Baly, l. c. p. 232. Allied to *Diamphidia*, but with the hinder tibiae armed with a strong spine, and with the antennae in the male thickened and dilated from the third to the eighth joints, and the last three joints slender and filiform. Sp. *L. histrio*, Baly.

Platyxantha, Baly, l. c. p. 233. Elongated and depressed; antennae (♂) with the last two joints dilated and often of different shapes; posterior tibiae with a strong process close to the apex. Sp. *P. apicalis*, Baly, &c.

Doridea, Baly, l. c. p. 236. Very nearly allied to *Platyzantha*, but with the penultimate and antepenultimate joints of the antennæ dilated, and the process of the hinder tibiæ acute. Sp. *D. insignis*, Baly.

Theopea, Baly, l. c. p. 237. Head exserted, sloping; antennæ slender, first joint longest, in ♂ subfusiform, in ♀ subfiliform, scarcely attenuated at apex; elytra parallel-sided, moderately convex, punctate-striate; posterior femora not incrassated; prosternum nearly obsolete. Type *T. impressa* (Fab.).

Atysa, Baly, l. c. p. 238. Allied to *Galleruca*, but of an elongate, narrow, parallel-sided form; elytra thickly punctate, clothed with a short down; prosternum very narrow; posterior femora not thickened. Sp. *A. terminalis*, Baly.

Alopena, Baly, l. c. p. 239. Nearly allied to *Luperodes* (Motsch.), but with the antennæ long and slender, the third joint as long as the first. Sp. *A. collaris*, Baly.

Nisotra, Baly, Ann. & Mag. N. H. 3rd ser. vol. xiv. p. 437. Allied to *Podagrica*. Thorax with two impressions on its anterior and posterior margins; elytra with punctures confusedly arranged in two-rowed striæ. Type *N. gemella* (Erichs.).

Sebathe, Baly, l. c. p. 438. Ovate, moderately convex; margins of thorax and elytra narrowly reflexed; posterior tibiæ broadly channelled, bisinuate at apex, and armed with an acute spine; tarsi apical, claws appendiculate. Type *S. badia* (Erichs.).

Phitrea, Baly, Ent. M. Mag. vol. i. p. 134. Allied to *Systema*, but with the elytra punctato-striate. *I. limbata*, sp. n., Baly, p. 135, from Columbia.

New species :—

Galleruca semipullata, Clark, Journ. of Ent. ii. p. 257, from North Australia; *G. sareptana*, Stierlin, Bull. Soc. Nat. Mosc. 1863, p. 501, from Sarepta.

Adorium dorsosignatum, Clark, l. c. p. 258, and *A. fryii*, Clark, ibid., from Queensland; *A. seminigrum*, Clark, ibid., from "New Holland"; and *A. lætabile*, Clark, l. c. p. 259, from Woodlark Island and New South Wales.

Cerochroa maculicollis, Baly, Ent. Trans. 3rd ser. vol. ii. p. 232, from Old Calabar.

Cælomera viridis, Philippi, Stett. ent. Zeit. 1864, p. 393, from Chili.

Systema batesii, Baly, Ann. & Mag. Nat. Hist. 1864, xiv. p. 437, from Ega.

Arsipoda. Baly has described five new Australian species of this genus: namely, *Arsipoda fulvicollis*, l. c. p. 440, and *A. femorata*, ibid., from Adelaide; *A. macleayi*, l. c. p. 441, and *A. lownei*, ibid., from Sydney; and *A. rugulosa*, l. c. p. 442, from Melbourne.

Luperus revelieri, Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 301, from Corsica.

Hamlet Clark describes the following new species of *Schematiza*: *Schematiza amplicornis*, Ent. Trans. 3rd ser. vol. ii. p. 261, from Brazil; *S. vicina*, l. c. p. 262, from Brazil; *S. æquinoctialis*, l. c. p. 263, from Columbia; *S. venusta*, ibid., from the Amazons; *S. præusta*, l. c. p. 265, from Buenos Ayres and Brazil; *S. lineaticollis*, l. c. p. 266, from New Granada; *S. nigricollis*, ibid., from New Granada; *S. antennalis*, l. c. p. 267, from Brazil; *S. annuli-*

cornis, *ibid.*, from Columbia; *S. scutellaris*, l. c. p. 268, from Venezuela; *S. apicalis*, *ibid.*, from New Granada; *S. hispidiformis*, l. c. p. 269, from Brazil; and *S. emarginata*, *ibid.*, from Brazil.

Calopepla livingstonii, Baly, Ent. Trans. 3rd ser. vol. ii. p. 239, from the Zambesi.

Dolichotoma salvinii, Baly, l. c. p. 241, from Panama.

Mesomphalia salvinii, Baly, l. c. p. 242, from Panama.

Batonota godmanii, Baly, l. c. p. 242, from Panama.

Haltica. Numerous new Chilean species of this genus are described by Philippi: *Haltica* ? (*Graptodera* ?) *atrocyanea*, l. c. p. 395; *H. (Grapt. ?) annulicornis*, *ibid.*; *H. (Grapt. ?) flavipes*, l. c. p. 396; *H. (Grapt. ?) fulvicollis*, *ibid.*; *H. (Grapt. ?) pyrrhoptera*, *ibid.*; *H. (Crepidodera) posticalis*, l. c. p. 397; *H. (Crep.) landbecki*, *ibid.*; *H. (Crep.) notata*, *ibid.*; *H. (Crep.) sororia*, *ibid.*; *H. (Crep.) geissei*, l. c. p. 398; *H. (Plectroscelis ?) gracilis*, *ibid.*; *H. (Teinodactyla) pusilla*, *ibid.*; *H. meloëformis*, l. c. p. 399; *H. melampus*, *ibid.*; *H. landbeckiana*, l. c. p. 400; *H. aurea*, *ibid.*; *H. bellula*, l. c. p. 401.

Haltica lubrica, Woll. Cat. Can. Col. p. 406, from Teneriffe; and *H. planifrons*, Woll. l. c. p. 408, from Palma.

Longitarsus strigicollis, Woll. l. c. p. 412; *L. vitis*, Woll. l. c. p. 415; from the Canaries.

Teinodactyla maderensis, Allard, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 659, from Madeira.

Plectroscelis coyei, Allard, l. c. p. 659, from Syria.

Dibolia obtusa, Woll. l. c. p. 417, from Fuerteventura.

Menippus (g. n.) *cynicus*, Clark, Journ. of Ent. ii. p. 257, from Port Denison.

Rupilia (g. n.) *ruficollis*, Clark, l. c. p. 260, pl. 12. fig. 3, and *R. viridi-ænea*, Clark, *ibid.*, from New South Wales.

Eratosthenes (g. n.) *flavus*, Clark, l. c. p. 261, pl. 12. fig. 6, from New South Wales.

Febra (g. n.) *venusta*, Clark, l. c. p. 262, pl. 12. fig. 5, from the Fiji Islands.

Clitena (g. n.) *limbata*, Baly, Ent. Trans. 3rd ser. vol. ii. p. 230, and *C. melancholica*, Baly, l. c. p. 231, from Siam.

Laphris (g. n.) *emarginata*, Baly, l. c. p. 231, from China.

Latani (g. n.) *histrion*, Baly, l. c. p. 232, from Natal.

Platyrantha (g. n.) *apicalis*, Baly, l. c. p. 234, from Sumatra; *P. nigricornis*, Baly, *ibid.*, from Java; and *P. ventralis*, Baly, l. c. p. 235, from Singapore.

Doridea (g. n.) *insignis*, Baly, l. c. p. 236, from Tringanee.

Theopea (g. n.) *pulchella*, Baly, l. c. p. 237, from Sumatra; *T. elegantula*, Baly, l. c. p. 238, from Sarawak; and *T. mouhoti*, Baly, *ibid.*, from Siam.

Atysa (g. n.) *terminalis*, Baly, l. c. p. 239, from Mysol.

Alopena (g. n.) *collaris*, Baly, l. c. p. 239, from New Guinea.

Hispides.

New genera :—

Charistena, Baly, Ent. Trans. 3rd ser. vol. ii. p. 251. Nearly allied to *Odontota*. Body elongated and slender; head obtuse; antennæ composed

of eleven distinct joints, of which the last five form a slender club; intermediate tibiae curved. Described species, *C. ruficollis* (Fab.), *C. nigrita* (Oliv.), and *C. ariadne* (Newm.).

Metazygocera, Baly, l. c. p. 255. Nearly allied to the preceding genus and to *Odontota*, but with the head very slightly prominent in front, the antennae subfusiform, with eleven cylindrical joints, and the first two segments of the abdomen beneath separated by a distinct suture. Described species, *M. purpurata* (Guér.), *M. trimaculata* (Oliv.).

Hispoleptis, Baly, Ann. & Mag. Nat. Hist. 3rd ser. vol. xiv. p. 262. Elongate, sides parallel; head porrect; antennae robust, 1st joint subglobose, 2nd short, 3rd elongate, twice as long as 4th; 4th to 9th decreasing in length; thorax subelongate, sides straight, narrowed in front; scutellum pentagonal; claws distant. Sp. *H. diluta* (Guér.).

Acanthodes, Baly, l. c. p. 262. Elongate; head porrect, produced between the eyes; antennae rigid, joints 1 and 2 short, equal, 3-11 coalescent, articulations often obsolete; scutellum transverse, obtuse; claws contiguous. Sp. *A. generosa*, Baly, &c.

Stethispa, Baly, l. c. p. 265. Elongate; head porrect, not produced between the eyes; antennae subfusiform, joint 1 short, 2-4 scarcely longer, 5-11 a little longer, equal; claws approximate. Sp. *S. bonvouloirii*, Baly, &c.

Microrhopala, Baly, l. c. p. 268. Very nearly allied to *Odontota*, but body ovate. Type *M. vittata* (Fab.), l. c. p. 268. Known species: *M. xerene* (Newm.), l. c. p. 269; *M. excavata* (Oliv.), ibid.

New species:—

Charistena (g. n.). Baly describes the following new species of this genus: *Charistena lecontei*, Baly, Ent. Trans. 3rd ser. vol. ii. p. 252, from North America; *C. basalis*, Baly, l. c. p. 253, from the Amazons; *C. deyrollei*, Baly, ibid., from the Upper Amazons and Columbia; *C. bellula*, Baly, ibid., from Bogota; *C. elegantula*, Baly, l. c. p. 254, from New Granada; *C. pilatei*, Baly, ibid., from Teapa; and *C. trilineata*, Baly, l. c. p. 255, from Yucatan.

Metazygocera (g. n.) *rubroguttata*, Baly, l. c. p. 256; *Metazygocera amazona*, Baly, l. c. p. 257; and *Metazygocera serripustulata*, Baly, l. c. p. 258; all from the Amazons.

Acanthodes (g. n.). Baly describes five new species of this genus: *Acanthodes generosa*, Ann. & Mag. Nat. Hist. vol. xiv. p. 262, from Ega; *A. hebe*, l. c. p. 263, from Surinam; *A. nigripennis*, l. c. p. 264, from Cayenne; *A. tarsata*, ibid., from Brazil; *A. lateralis*, l. c. p. 265, from Peru.

Stethispa (g. n.). Baly describes four species: *Stethispa bonvouloirii*, l. c. p. 266, from the Amazons and Peru; *S. gratiosa*, ibid., from the Amazons; *S. confusa*, l. c. p. 267, from Obydos; *S. conicicollis*, ibid., from Cayenne.

Microrhopala (g. n.) *perforata*, Baly, l. c. p. 269, from New Granada; *M. pulchella*, Baly, l. c. p. 270, from Mexico; *M. sallei*, Baly, l. c. p. 271, from Guatemala and Mexico; *M. bivitticollis*, Baly, l. c. p. 270, origin unknown.

Aburnus batesii, Baly, Ann. & Mag. Nat. Hist. l. c. p. 334, from Ega.

Uroplata. Of this genus Baly describes the following new species:—AMAZONIAN SPECIES: *Uroplata militaris*, l. c. p. 335; *U. submarginalis*, l. c. p. 337; *U. pretiosa*, l. c. p. 338; *U. stali*, l. c. p. 339; *U. concava*, l. c. p. 342; *U. cincta*, ibid. BRAZILIAN SPECIES: *U. puella*, l. c. p. 337; *U. pectoralis*,

l. c. p. 339; *U. cruentata*, l. c. p. 340; *U. octopustulata*, l. c. p. 341; *U. robinsonii*, l. c. p. 343. From VENEZUELA, *U. miniata*, l. c. p. 344.

EROTYLIDÆ.

Xestus, g. n., Woll. Cat. Can. Col. p. 420. Allied to *Aulacochilus*, resembling *Throsus* in appearance; head exserted; prothorax subconic, trisinuate at base, posterior angles produced; antennal club triarticulate; mandibles with one tooth within; maxillary palpi with 1st joint long and cylindrical, 2nd and 3rd shorter and stouter, 4th very large and securiform; last joint of labial palpi securiform; legs stout, tarsi 5-jointed. Sp. *X. throsoides*, Woll. l. c. p. 421, from Teneriffe.

Triplax valdiviana, sp. n., Philippi, Stett. ent. Zeit. 1864, p. 401, from Chili.

ENDOMYCHIDÆ.

Lycoperdina brevis, sp. n., Perris, Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 303, from Algeria.

Lycoperdina humeralis, sp. n., Woll. Cat. Can. Col. p. 432, from Teneriffe.

Dapsa edentata, sp. n., Woll. l. c. p. 432, from the Canaries.

COCCINELLIDÆ.

Coccinella. Five new species are described by Philippi, Stett. ent. Zeit. 1864: *Coccinella magellanica*, l. c. p. 402, *C. nitida*, l. c. p. 403, *C. funebris*, ibid., and *C. vittata*, l. c. p. 404, from Chili; *C. limensis*, l. c. p. 402, from Lima.

Coccinella æthiops, sp. n., Bland, Proc. Ent. Soc. Phil. vol. iii. p. 72, from the Colorado Territory.

Coccinella miranda, sp. n., Woll. Cat. Can. Col. p. 422, from the Canaries.

Epilachna 4-plagiata, sp. n., Woll. l. c. p. 425, and *E. bella*, sp. n., Woll. ibid., from the Canaries.

Epilachna maculiventris, sp. n., Bland, Proc. Ent. Soc. Phil. vol. iii. p. 256, from the Colorado Territory.

Scymnus. The following four new Canarian species are described by Wollaston: *Scymnus canariensis*, l. c. p. 426; *S. oblongior*, l. c. p. 427; *S. cercyonides*, l. c. p. 428; and *S. maculosus*, ibid.

Lithophilus deserticola, sp. n., Woll. l. c. p. 431, from Fuerteventura.

Clypeaster variegatus, sp. n., Philippi, l. c. p. 404, from Chili.

Exochomus xanthoderus, sp. n., Fairmaire, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 648, from Algeria.

HYMENOPTERA.

A. *Separate Publications.*

Catalogus specierum generis *Scolia* (sensu latiori) continens specierum diagnoses synonymiamque, additis annotationibus explanatoriis criticisque. Conscripserunt HENRICUS DE SAUSSURE et JULIUS SICHEL. Genevæ et Parisiis, 1864, pp. 225 and 1 plate.

B. *Papers published in Journals, &c.*

BASSETT, H. F. Descriptions of several new species of *Cynips*, and a new species of *Diastrophus*. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 679-691. December 1864.

COUPER, WM. On a gall-producing Hymenopter, reared from *Triticum repens*, Linn. Canad. Natural. and Geol. new ser. vol. i. pp. 444-446. December 1864.

CRESSON, E. T. On the North American species of the genus *Osmia*. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 17-38. April 1864.

CRESSON, E. T. Descriptions of several new species of North American *Apidae*. Ibid. pp. 38-43.

CRESSON, E. T. Descriptions of North American Hymenoptera in the Collection of the Entomological Society of Philadelphia. Ibid. pp. 131-194, June; and pp. 257-321, September 1864.

CRESSON, E. T. On the North American species of several genera of *Apidae*. Ibid. vol. ii. pp. 373-411. February 1864.

CRESSON, E. T. Descriptions of two new genera of North American Ichneumonidae. Ibid. vol. iii. pp. 397-402. November 1864.

CRESSON, E. T. Descriptions of two new species of *Masaris*. Ibid. pp. 672-678. December 1864.

DUFOUR, LÉON. Note sur une nouvelle espèce de Fourmi (*Formica vinsonnella*). Ann. Soc. Ent. Fr. 4^e série, tome iv. p. 210. 12th October, 1864 (read 13th April, 1864).

DUFOUR, LÉON. Description du *Siphonura gallæ quercus*, nouvelle espèce de Chalcidite. Ibid. pp. 213, 214. 12th October, 1864 (read 13th April, 1864).

EDGEWORTH, R. L. Notes on Irish Vespidae. Ann. & Mag. Nat. Hist. 3rd series, vol. xiii. pp. 466-474, June 1864; and Proc. Nat. Hist. Soc. Dublin, vol. iv. pp. 96-104. January, 1865.

HAGEN, H. Schädlicher Einfluss der Zuckerfabriken auf die Bienenzucht. Stett. entom. Zeitung, 1864, pp. 89 & 90.

Contains a notice of a statement made by a gardener of Wisternitz, in Moravia, to the effect that since the establishment of a sugar manufactory in that place, the bees, of which great numbers are kept there, have been annually destroyed to such an extent as to render their keeping quite unprofitable. The bees are attracted in the spring by the sweet odour issuing from the factory, on penetrating into which they are killed by the heat, or by immersion in the viscous fluid.

KAWALL, J. H. Beiträge zur Kenntniss der Hymenopteren-Fauna Russlands. Bull. Soc. Imp. Nat. de Moscou, 1864, pp. 293-303.

This memoir contains additions from Eversmann's manuscripts to the list of Russian Sawflies and *Chrysididae*, and includes descriptions of some new species.

LUCAS, H. Note sur le *Lophyrus pini* (Linn.) et sur son parasite le *Torymus obsoletus* (Fab.). Ann. Soc. Ent. Fr. 4^e série, tome iv. pp. 215 & 216. 12th October, 1864.

NORTON, EDWARD. Notes on *Tenthredinidae*, with descriptions of new species. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 5-16. April 1864.

A list of 34 species of *Tenthredinidae* and *Uroceridae* found in the United States, with notes upon the distribution and on the variations of the known species.

OSTEN-SACKEN, R. Ueber den wahrscheinlichen Dimorphismus der Cynipiden-Weibchen. (Abstract of Walsh's observations.) Stett. ent. Zeit. 1864, pp. 409-413.

SIEBOLD, C. T. E. von. Ueber Zwitterbienen. Zeitschr. für wiss. Zool. 1864, p. 73; abstract in Ann. & Mag. Nat. Hist. 3rd series, vol. xiv. p. 158.

SMITH, FREDERICK. On the construction of hexagonal cells by Bees and Wasps. Trans. Ent. Soc. Lond. 3rd series, vol. ii. pp. 131-142, plate 13. August 1864.

SMITH, FREDERICK. Descriptions of new species of Brazilian *Pompilidae*. Journ. of Entom. vol. ii. pp. 263-270. December 1864.

SMITH, FREDERICK. Notes on Hymenoptera. Entom. Annual, 1864, pp. 108-117, and 1865, pp. 81-96.

SMITH, FREDERICK. On the sagacity exhibited by certain Bees and Ants. Zoologist, 1864, pp. 9073-9077.

VOLLENHOVEN, S. C. SNELLEN VAN. Die Inlandsche Bladwespen in hare Gedaantewisseling en Levenswijze. 10de Stuk. Tijdschrift voor Entomologie, vii. Deel, pp. 59-74, pl. 1-3. Haarlem, 1864.

WALKER, FRANCIS. Characters of undescribed species of *Smiera*. Trans. Ent. Soc. London, 3rd series, vol. ii. pp. 181-207. November 1864 (read 6th June 1864).

WALSH, B. D. On dimorphism in the Hymenopterous genus *Cynips*; with an appendix containing hints for a new classification of Cynipidæ, and a list of Cynipidæ, including descriptions of several new species, inhabiting the oak-galls of Illinois. Proc. Ent. Soc. Phil. vol. ii. pp. 409-413.

WATERHOUSE, G. R. On the formation of the Cells of Bees and Wasps. Trans. Ent. Soc. Lond. 3rd series, vol. ii. pp. 115-130, plate 13. August 1864 (read 7th March, 1864).

Waterhouse has again indicated his views upon the formation of the hexagonal cells of Wasps and Bees, maintaining that the cells are to be regarded essentially as cylinders in juxtaposition, the hexagonal form being produced as if by mutual pressure. (Trans. Ent. Soc. pp. 115-130.)

Smith, on the contrary, maintains (*l. c.* pp. 131-142) that the insects form hexagonal cells, and adduces various examples in which even the marginal cells of a comb have their outer walls angular. The nests exhibited in support of his views included those of *Icaria guttatipennis*, *Nectarina lecheguana*, *Tatua morio*, *Polistes tepidus* and *tasmaniensis*, *Vespa vulgaris*, and *Apis mellifica*.

Tegetmeier (Proc. Ent. Soc. Lond. 1864, p. 33) holds that the cell of the hive-bee is always hemispherical at its commencement; hemispherical cups are hollowed out and enlarged by the bees until they come in contact, the bees gnawing away all the material so far as is consistent with the integrity of the comb, and thus the hexagonal form is produced. He denies the existence of any "geometrical instinct" in the bee, and regards the hexagonal form as a consequence of the geometrical law that six circles of equal radii will exactly surround a seventh. This notion is evidently nearly identical with Waterhouse's view.

Newman (Zool. pp. 9055-9057) supports Waterhouse's view of the formation of Bees' cells.

Smith (Zool. pp. 9073-9077) replies to Newman, and cites several instances of apparent reasoning in insects, especially the various selections of breeding-places made by different individuals of *Osmia aurulenta*, in support of his view that the hexagonal cells of Bees and Wasps are directly constructed of that form.

Smith publishes observations on British Hymenoptera, and especially on

the scarcity of *Andrenidæ* and other aculeate forms in 1863, in Ent. Ann. 1864, pp. 108-117.

The same author records the capture of some species of Hymenoptera new to the British fauna, and furnishes details as to the occurrence of known forms during the year 1864, in Ent. Ann. 1865, pp. 81-96.

ANTHOPHILA.

SIEBOLD has investigated some hermaphrodite bees belonging to the Italian race, obtained from a Dzierzon hive at Constance. He found in many of them a combination of sexual characters, not only in external parts, but also in the generative organs. The mixture of external characters is manifested sometimes only in the anterior or posterior part of the body, sometimes in all parts of the body or only in a few organs. Some specimens present male and worker characters on the two sides of the body. The development of the internal organs is singularly correlated with these peculiarities of external organization. The sting, with its vesicle and gland, is well-developed in hermaphrodites with the abdomen of the worker; soft in those with the drone-abdomen. The seminal receptacle, when present, is empty. The ovaries contain no ova. In the hermaphrodites with the drone-abdomen the male sexual organs are well-developed, and the testes contain spermatozooids. Frequently both testicular and ovarian organs are present on each side, the epididymis and copulatory apparatus are well developed, and an imperfect poison-apparatus exists. In these cases the tubes contain spermatozooids, but there are no ova in the ovaries. The hermaphrodites are thrown out of the hive by the workers as soon as they emerge, and speedily perish. Siebold ascribes the production of these hermaphrodites to an imperfect fecundation of the ovum. Zeitschrift für wiss. Zool. 1864, p. 73; abstract in Ann. & Mag. N. H. 3rd ser. vol. xiv. pp. 158 & 159.

Tegetmeier mentions an instance in which Bees, upon taking possession of a tenantless hive with empty combs, secreted a quantity of new wax, and with it fastened the combs securely to the wooden frames in which they had been inserted. Proc. Ent. Soc. 1864, pp. 28 and 32, 33.

Smith records the occurrence of *Bombus pomorum* (Panz.) in Britain. Proc. Ent. Soc. 1864; and Ent. Ann. 1865, p. 96.

The male of *Halictus prasinus* is described by Smith. Ent. Ann. 1865, p. 93.

New genera:—

Andronicus, Cresson, Proc. Ent. Soc. Phil. vol. ii. p. 384. Closely allied to *Chelostoma*, but with the maxillary palpi four-jointed; antennæ in ♂ with joints 2-5 dilated, sixth joint suddenly narrower, remainder gradually decreasing to the pointed apex. Sp. *A. cylindricus*, Cresson.

Alcidamea, Cresson, l.c. p. 385. Allied to *Chelostoma* and *Heriades*, but

maxillary palpi 4-jointed; antennæ in ♂ with flagellum submoniliform, joints compressed, last joint terminating in a slender curved spine. Sp. *A. pilosifrons*, Cresson; *A. producta*, Cress.

Monumetha, Cresson, l. c. p. 387. Allied to *Chelostoma*, but maxillary palpi 5-jointed; antennæ short, filiform. Sp. *M. argentifrons*, Cress., &c.

New species :—

Xylocopa californica, Cresson, l. c. p. 40, from California.

Bombus consimilis, Cresson, l. c. p. 41, from Canada, New York, &c.; *B. centralis*, Cress. ibid., from California.

Apathus ashtoni, Cresson, l. c. p. 42, from Canada, Maine, and New York.

Andronicus (g. n.) *cylindricus*, Cresson, l. c. p. 384, from Connecticut.

Aldidamea (g. n.) *pilosifrons*, Cresson, l. c. p. 386, from Connecticut; and *A. producta*, Cresson, ibid., from Virginia.

Monumetha (g. n.) *argentifrons*, Cresson, l. c. p. 387, from Pike's Peak; *M. obsoleta*, Cress. l. c. p. 38, from Pike's Peak and Hudson's Bay Territory; and *M. borealis*, Cress. ibid., from the Great Slave Lake.

Anthidium simile, Cresson, Proc. Ent. Soc. Phil. vol. ii. p. 378, from Massachusetts.

Heriades simplex, Cresson, l. c. p. 384, from Connecticut.

Ceratina tejonensis, Cresson, l. c. p. 390, from California.

Epeolus pusillus, Cresson, l. c. p. 398, from Massachusetts; *Epeolus bifasciatus*, Cresson, l. c. p. 38, from Illinois.

Celiorys brevis, Cresson, l. c. p. 402, from Connecticut, &c.; *C. mastia*, Cress. l. c. p. 403, from Connecticut; *C. lateralis*, Cress. l. c. p. 405, from Pennsylvania.

Stelis lateralis, Cresson, l. c. p. 410, from Pennsylvania; *S. elegans*, Cress. l. c. p. 411, from Pike's Peak, Colorado Territory; *S. montana*, Cress. l. c. p. 39, from the Colorado Territory.

Osmia. Of this genus Cresson describes the following new North American species (Proc. Ent. Soc. Phil. vol. iii.): *Osmia bucephala*, l. c. p. 17, from British N. America; *O. megacephala*, l. c. p. 18, *O. longula*, l. c. p. 19, and *O. juxta*, ibid., from the Colorado Territory; *O. latitarsis*, l. c. p. 20, from New York and Virginia; *O. hudsonica*, l. c. p. 21, from the Hudson's Bay Territory; *O. propinqua*, l. c. p. 23, and *O. californica*, l. c. p. 24, from California; *O. montana*, ibid., and *O. densa*, l. c. p. 25, from Pike's Peak, Colorado; *O. purpurea*, l. c. p. 27, from the Eastern States; *O. sericea*, ibid., from the Colorado Territory; *O. atriventris*, l. c. p. 29, from Connecticut; *O. dubia*, ibid., from Pike's Peak; *O. distincta*, l. c. p. 30, from Connecticut; *O. albiventris*, l. c. p. 31, from Connecticut, New York, and Pennsylvania; *O. conjuncta*, ibid., from Connecticut; *O. proxima*, l. c. p. 32, from Maine and Mackenzie River; *O. canadensis*, l. c. p. 33, from Canada West; *O. cognata*, ibid., from Illinois; *O. fulgida*, l. c. p. 34, *O. viridis*, ibid., and *O. pusilla*, l. c. p. 35, from the Colorado; *O. pumila*, ibid., from Pennsylvania; *O. brevis*, l. c. p. 36, from the Colorado; *O. globosa*, ibid., from the Great Slave Lake; *O. rustica*, l. c. p. 37, from Pennsylvania; and *O. vicina*, l. c. p. 38, from Virginia.

VESPIDÆ.

Edgeworth has published (Ann. & Mag. N. H. 3rd ser. vol. xiii. pp. 466—

474) some notes on the habits of the species of *Vespa* occurring in Ireland. Five out of the seven British species are found in that country: namely, *Vespa vulgaris*, *V. germanica*, *V. rufa*, *V. britannica*, and *V. holsatica*. *Vespa borealis* and *V. crabro* are wanting in Ireland.

F. Smith exhibited to the Entomological Society examples of Wasps' nests of fantastic shapes artificially produced by Mr. Stone of Bournemouth (Proc. Ent. Soc. p. 26). The mode in which the insects are induced to construct these nests is described by Stone, Proc. Ent. Soc. pp. 33-35.

Some remarks on the abundance or scarcity of Wasps in particular years, and their connexion with cold or wet seasons, as observed near Chichester, were contributed anonymously to the Entomological Society of London (see Proc. 1864, p. 27).

Cresson describes the variations to which *Masaris vespoides* (Cress.) is subject. Proc. Ent. Soc. Phil. vol. iii. p. 673.

Masaris zonalis, sp. n., Cresson, Proc. Ent. Soc. Phil. vol. iii. p. 674, and *M. marginalis*, sp. n., Cresson, l. c. p. 677, both from the Colorado Territory.

POMPIDIDÆ.

Smith publishes revised generic and specific characters of *Evagethes bicolor* (S. Farg.) in Ent. Ann. 1865, pp. 90, 91. He also describes the ♂ of *Crabro palmipes*, ibid.

New species:—

Agenia manifestata, Smith, Journ. of Ent. ii. p. 264, from Tunantins, on the Amazons; *A. nobilitata*, Smith, ibid. from Pará; *A. sanguinolenta*, Smith, ibid., and *A. femorata*, Smith, l. c. p. 265, from Villa Nova; *A. ruficeps*, Smith, ibid., *A. volatilis*, Smith, ibid., *A. abdominalis*, Smith, ibid., and *A. polistiformis*, Smith, l. c. p. 266, from Ega; *A. annulata*, Smith, ibid., *A. viridis*, Smith, ibid., and *A. aulica*, Smith, l. c. p. 267, from St. Paul.

Pompilus imitator, Smith, l. c. p. 267, and *P. fragilis*, Smith, ibid., from Ega; *P. ichneumoniformis*, Smith, l. c. p. 268, from Villa Nova.

Priocnemis opulenta, Smith, l. c. p. 268, from Ega.

Notocyphus vindex, Smith, l. c. p. 268, from St. Paul, Brazil.

Ceropales agilis, Smith, l. c. p. 269, from Mexico; *C. luctuosus*, Smith, ibid., and *C. crassicornis*, Smith, ibid., from Ega.

SCOLIIDÆ.

De SAUSSURE and SICHEL have published a valuable monographic catalogue (Catalogus specierum generis *Scolia*, &c., see p. 456) of the species of the old genus *Scolia*, in which they bring together all the numerous forms which have been described in late years, with diagnoses of all the species known to them. In the introduction to their catalogue they review Burmeister's monograph of the *Scolia*, and object to the nomenclature employed by him for describing the venation of the wing, and remark that neither the genus *Cosila* (Guér.) nor *Epomidiopteron* (Romand) appears to belong to the Scoliine type. The latter genus they consider to be nearly allied to the *Tiphia*, with which

it very closely agrees in the venation of the wings; *Cosila*, according to them, approaches the *Myzinæ*. They give the following tabular synopsis (here slightly abridged) of the genera and subgenera (including *Cosila*) formed at the expense of the old genus *Scolia* :—

A. Second cubital cell irregularly quadrangular, trapezoid, placed in a direct line with the first and third cubitals. Three closed cubital cells. Radial cell elongated, pointed, neither truncated nor removed from the margin of the wing *COSILA* (Guér.).

B. Second cubital cell triangular, applied obliquely to the first cubital; radial placed at the end of the first cubital; radial cell short, truncated, or removed at its extremity from the margin of the wing (*SCOLIA* proper *sensu latiori*).

I. A single recurrent vein.

a. Third discoidal cell petiolated upon the second cubital *LIACOS* (Guér.).

1. Three closed cubitals *Triliacos*, subg.

2. Two closed cubitals *Diliacos*, subg.

b. Third discoidal cell wanting *SCOLIA* (Fab.).

1. Three closed cubitals *Triscolia*, subg.

2. Two closed cubitals *Discolia*, subg.

II. Two free recurrent veins, both reaching the second

cubital cell *ELIS* (Fab.).

1. Three closed cubitals *Trielis*, subg.

2. Two closed cubitals *Diehis*, subg.

The total number of species recorded by the authors, including *sp. incertæ sedis* and *sp. dubiæ*, is 272, of which they are acquainted with 264. Upon the geographical distribution of the species they state that the *Scolia* attain their maximum of development in the old world, especially in tropical Africa and Asia. The *Elides*, on the contrary, attain their maximum in America. In Europe the *Scolia* are more numerous than the *Elides*; in Africa the two groups are exactly balanced; in Asia the *Scolia* predominate. In Australia *Elis* predominates over *Scolia*, as also in America; but in the former the species are few.

The following known species of *Scoliidae* are figured by Saussure and Sichel (Catalogus specierum, &c.): *Scolia badia* (Sauss.), pl. 1. fig. 9; *Elis* (*Trielis*) *xantiana* (Sauss.), pl. 1. figs. 10 & 11.

New species :—

Scolia (*Triscolia*) *hyalinata*, Sichel, Catal. p. 53, pl. 1. fig. 12, *S.* (*Discolia*) *micromelas*, Sichel, Catal. p. 82, from Senegambia; *S.* (*Discolia*) *caffra*, Saussure et Sichel, l. c. p. 84, from S. Africa; *S.* (*Discolia*) *smithii*, Sauss. et Sichel, l. c. p. 86, from S. Africa and the Gambia (= *aureipennis*, Smith); *S.* (*Discolia*) *molesta*, Sauss. et Sichel, l. c. p. 111, = *erratica* (Sauss., not Smith), from the Malayan region; *S.* (*Discolia*) *vittifrons*, Sichel, l. c. p. 125, from Siam.

Elis (*Trielis*) *australensis*, Sauss. et Sichel, l. c. p. 144, from Australia,

E. (Trielis) nilotica, Sauss. et Sichel, l. c. p. 153, from Egypt; *E. (Dielis) distinguenda*, Sauss. l. c. p. 171, from Egypt; *E. (Dielis) klugii*, Sauss. et Sichel, l. c. p. 172, from Nubia (= *E. hyalina*, Klug nec Lepell.); *E. (Dielis) caelebs*, Sichel, l. c. p. 184, from Africa; *E. (Dielis) vittata*, Sichel, l. c. p. 214, from Brazil and Mexico; *E. (Dielis) cineraria*, Sichel, l. c. p. 225, pl. 2. figs. 13, 14, from Montevideo; *E. (Dielis) mutanda*, Sauss. et Sichel, l. c. p. 233, pl. 2. fig. 15, from Brazil (= *E. variegata*, Sauss.); *E. (Dielis) ambigua*, Sichel, l. c. p. 235, from Brazil; *E. (Dielis) regalis*, Sichel, l. c. p. 190, from China; *E. (Dielis) limbata*, Sauss. l. c. p. 206, from Java; *E. (Dielis) wagneriana*, Sauss. l. c. p. 229, from S. America.

FORMICIDÆ.

Aubé describes the habits of a large black Ant (*Atta capitata*?) found abundantly in the South of France. Bull. Soc. Ent. Fr. 1863, pp. li, lii.

Smith describes and figures *Formica exsecta* (Nyl.). Ent. Ann. 1865, p. 87, fig. 2.

The male of *Myrmica lippula* is figured by Smith, Ent. Ann. 1864, fig. 2.

Formica vinsonnella, sp. n., L. Duf. Ann. Soc. Ent. Fr. 4^e série, tom. iv. p. 210, from Reunion.

ICHNEUMONIDÆ.

Evaniides :—

Cresson describes the female of *Fœnus tarsatorius* (Say). Proc. Ent. Soc. Phil. vol. iii. p. 133.

Fœnus. Of this genus Cresson describes the following four new species from the Colorado Territory (Proc. Ent. Soc. Phil. vol. iii.) : *Fœnus occidentalis*, l. c. p. 131; *F. perplexus*, ibid.; *F. montanus*, l. c. p. 132; and *F. incertus*, l. c. p. 133.

Aulacus rufitarsis, sp. n., Cresson, l. c. p. 134, from the Colorado; *A. stigmaterus*, sp. n., Cress. ibid., from New Jersey.

Ichneumonides :—

Grotea, g. n., Cresson, Proc. Ent. Soc. Phil. vol. iii. p. 397. Thorax much elongated in front of wings, flattened; wings long and narrow, stigma and areolet of fore wings nearer than usual to the apex; abdomen much elongated, slender, basal segment very long, curved upwards at the middle; ovipositor as long as first segment. Sp. *G. anguina*, Cresson.

Labena, g. n., Cresson, l. c. p. 399. Neuration of the wings similar to that of *Grotea*; posterior coxæ very long, nearly cylindrical; abdomen much elongate and clavate, especially in male. Type *L. grallator* (Say).

Cresson states that Say has described two distinct species under the name of *Ichneumon parata*, one in Contrib. Macl. Lyc. i. p. 68, the other in Bost. Journ. Nat. Hist. i. p. 228. The latter is *Ichn. letus* (Brulle); the former belongs to the genus *Ischnus*, and may stand as *Ischnus paratus* (Say). Proc. Ent. Soc. Phil. vol. iii. p. 156.

Ichneumon. Seventy-six new North American species of this genus are described by Cresson, Proc. Ent. Soc. Phil. vol. iii., namely :—

§ 1. Black species :—

Ichneumon maurus, l. c. p. 135, from Virginia; *I. orpheus*, l. c. p. 136, *I. viola*,

l. c. p. 137, *I. saucius*, *ibid.*, from Pennsylvania; *I. afer*, from Illinois; *I. ater*, *ibid.*, from New York and Illinois; *I. cineticornis*, l. c. p. 139, from Pennsylvania; *I. blakei*, *ibid.*, *I. montanus*, l. c. p. 141, *I. pedalis*, *ibid.*, and *I. semilævis*, l. c. p. 142, from the Colorado; *I. flavicornis*, l. c. p. 140, from New York; and *I. ormenus*, l. c. p. 141, from Pennsylvania.

§ 2. Black species: scutellum white:—

I. vittifrons, l. c. p. 143, from Delaware; *I. pullatus*, l. c. p. 146, from Delaware and Illinois; *I. audax*, l. c. p. 143, *I. caliginosus*, l. c. p. 144, *I. tenebrosus*, l. c. p. 145, *I. cordatus*, l. c. p. 146, and *I. obliterated*, l. c. p. 147, from the Colorado Territory; *I. bronteus*, l. c. p. 144, from Philadelphia; *I. subcyanus*, l. c. p. 148, from New Jersey.

§ 3. Black species: scutellum pale or with pale markings; apical segment of abdomen more or less white:—

I. scelestus, l. c. p. 148, and *I. extrematis*, l. c. p. 149, from Illinois.

§ 4. Black species: scutellum pale; tip of first segment of abdomen more or less white:—

I. cæruleus, l. c. p. 149, Eastern States; *I. azotus*, l. c. p. 150, and *I. agnitus*, l. c. p. 151, Delaware.

§ 5. As preceding: abdomen fulvous at apex:—

I. apicalis, l. c. p. 152, from the Colorado.

§ 6. Scutellum pale; abdomen black, red, and white or yellow:—

I. variegatus, l. c. p. 153, *I. inconstans*, *ibid.*, and *I. grotei*, l. c. p. 154, from the Colorado.

§ 7. Scutellum pale; apex and, usually, middle of abdomen banded or spotted with yellow or white:—

I. nobilis, l. c. p. 155, *I. atrifrons*, l. c. p. 157, Illinois; *I. flavizonatus*, l. c. p. 156, New York and Virginia.

§ 8. Scutellum pale; abdomen banded with yellow, apex black:—

I. comes, l. c. p. 158, Illinois and Delaware; *I. parvus*, l. c. p. 159, Illinois and New York; *I. pictifrons*, l. c. p. 160, and *I. bizonatus*, *ibid.*, Colorado Territory.

§ 9. Scutellum pale; thorax black; abdomen red, or red and black:—

I. ambiguus, l. c. p. 161, and *I. funestus*, l. c. p. 166, Pennsylvania; *I. vinulentus*, l. c. p. 162, *I. consimilis*, l. c. p. 163, *I. juxta*, *ibid.*, *I. animosus*, l. c. p. 164, and *I. vultus*, l. c. p. 165, Colorado Territory.

§ 10. Scutellum yellow or red; thorax more or less red; abdomen red, or red and black:—

I. seminiger, l. c. p. 167, Eastern States; *I. discus*, l. c. p. 168, *I. longulus*, l. c. p. 171, *I. propinquus*, l. c. p. 172, *I. subfuscus*, l. c. p. 173, *I. brevipennis*, l. c. 174, *I. lævigatus*, l. c. p. 176, and *I. dorsalis*, l. c. p. 177, from the Colorado Territory; *I. subrufus*, l. c. p. 163, and *I. rutilus*, l. c. p. 169, Virginia; *I. vicinus*, l. c. p. 169, *I. rubicundus*, l. c. p. 176, and *I. lewisii*, l. c. p. 177, Illinois; *I. annulipes*, l. c. p. 170, and *I. pusillus*, l. c. p. 171, Delaware; *I. sandix*, l. c. p. 174, New York; *I. ? trogiformis*, l. c. p. 175, New Jersey.

§ 11. Scutellum black; abdomen red, or red and black:—

I. regnatræ, l. c. p. 178, Eastern States; *I. semicoccineus*, l. c. p. 179, Delaware and Virginia; *I. californicus*, l. c. p. 180, *I. incertus*, *ibid.*, and *I. rufizonatus*, l. c. p. 183, New Jersey; *I. virginicus*, l. c. p. 181; *I. syphax*, *ibid.*, 1864. [VOL. I.]

Delaware; *I. limbifrons*, l. c. p. 182, *I. exiguus*, ibid., and *I. involutus*, l. c. p. 183, Colorado Territory.

§ 12. Scutellum yellow or red; abdomen red, or red and black, apex white or yellow:—*I. terminalis*, l. c. p. 184, and *I. soror*, l. c. p. 185, Delaware; *I. velox*, ibid., Illinois.

Ischnus. Cresson describes 12 new North American species of this genus: namely, *Ischnus jejunus*, l. c. p. 186, Illinois, Massach.; *I. sublatius*, ibid., Illinois, Virg.; *I. proximus*, l. c. p. 187, *I. blandti*, l. c. p. 188, and *I. vinnulus*, l. c. p. 189, Pennsylvania; *I. wilsoni*, l. c. p. 188, Virginia; *I. contiguus*, l. c. p. 190, Maryland; *I. W-album*, l. c. p. 191, Eastern States; *I. volens*, l. c. p. 192, Virginia, Illinois; *I. scitulus*, l. c. p. 193, and *I. albitarsis*, l. c. p. 194, Illinois; and *I. iridescens*, l. c. p. 193, Delaware.

Tryphon. Cresson (l. c. pp. 272–281) describes 16 new North American species of this genus, namely:—

§ 1. Scutellum and abdomen black:—

Tryphon pelalis, l. c. p. 273, and *T. carinatus*, ibid., Illinois; *T. ? limatus*, l. c. p. 274, Delaware.

§ 2. Scutellum pale; abdomen black, margins of segments pale:—

T. ? submarginatus, l. c. p. 274, Illinois; *T. pleuralis*, l. c. p. 275, New Jersey.

§ 3. Scutellum pale; abdomen yellow and black:—

T. ? trifasciatus, l. c. p. 276, Pennsylvania.

§ 4. Scutellum black; abdomen red, or red and black, or black and yellow:—

T. americanus, l. c. p. 276, Delaware, Canada; *T. affinis*, l. c. p. 277, Pennsylvania, New Jersey; *T. seminiger*, l. c. p. 278, *T. semirufus*, ibid., *T. festivus*, l. c. p. 279, *T. tibialis*, l. c. p. 280, *T. rufocinctus*, ibid., *T. minimus*, l. c. p. 281, from Illinois; *T. analis*, l. c. p. 279, and *T. capitatus*, l. c. p. 281, Pennsylvania.

Cteniscus. Cresson (l. c. pp. 282–284) describes five new North American species: *Cteniscus mediatius*, l. c. p. 282, and *C. dorsalis*, ibid., Illinois; *C. orbitalis*, l. c. p. 283, Pennsylvania; *C. flavicoxæ*, ibid., and *C. clavatus*, l. c. p. 284, Delaware.

Exochus. Of this genus Cresson (l. c. p. 285–287) describes seven new North American species: *Exochus apicalis*, l. c. p. 285, *E. pygmaeus*, ibid., *E. pleuralis*, l. c. p. 286, and *E. pallipes*, l. c. p. 287, from Illinois; *E. fulvipes*, l. c. p. 285, Pennsylvania; *E. lævis*, l. c. p. 286, California and Illinois, and *E. dorsalis*, ibid., New Jersey.

Mesoleptus. Of this genus Cresson describes 30 new species from different parts of North America (l. c. pp. 257–272):

§ 1. Scutellum and abdomen black, margins of segments sometimes pale:—

Mesoleptus major, l. c. p. 257, Delaware; *M. annulipes*, ibid., from Canada; *M. ? validus*, l. c. p. 258, and *M. compressus*, l. c. p. 260, Pennsylvania; *M. tibiator*, l. c. p. 259, New Jersey, Illinois; *M. dubitatus*, l. c. p. 259, and *M. obliteratedus*, l. c. p. 260, Illinois.

§ 2. Scutellum black; abdomen red, or red and black:—

M. obscurus, l. c. p. 261, *M. argentifrons*, ibid., *M. conjunctus*, l. c. p. 262,

M. affinis, l. c. p. 263, *M. ? dimidiatus*, l. c. p. 265, *M. decoloratus*, ibid., *M. subtenuis*, l. c. p. 267, *M. nigripes*, ibid., and *M. hostilis*, ibid., from Illinois; *M. oxylus*, l. c. p. 262, Delaware and Illinois; *M. flavirictus*, l. c. p. 263, and *M. bicolor*, l. c. p. 269, Pennsylvania; *M. subrubidus*, l. c. p. 264, New Jersey, Illinois; *M. distinctus*, l. c. p. 266, *M. vicinus*, l. c. p. 268, and *M. flavifrons*, l. c. p. 269, New Jersey; *M. porrectus*, l. c. p. 266, and *M. vultus*, l. c. p. 268, Delaware.

§ 3. Scutellum pale or red; abdomen red, or red and black, or yellowish:—

M. longicornis, l. c. p. 270, *M. discolor*, l. c. p. 271, and *M. antennatus*, l. c. p. 272, Delaware; *M. unicolor*, l. c. p. 271, Pennsylvania, Delaware; and *M. concolor*, l. c. p. 270, New Jersey.

Trogus flavipennis, sp. n., Cresson, l. c. p. 287, from the Colorado.

Hoplismenus thoracicus, sp. n., Cresson, l. c. p. 288, from Pennsylvania.

Cryptus. Twenty-five new species of this genus are described by Cresson:

§ 1. Scutellum and abdomen black:—

Cryptus robustus, l. c. p. 289, *C. proximus*, l. c. p. 290, *C. luctuosus*, ibid., *C. nubilipennis*, l. c. p. 291, and *C. crassicornis*, l. c. p. 292, from the Colorado Territory; *C. velox*, l. c. p. 293, from New York.

§ 2. Scutellum pale; abdomen black:—

C. excelsus, l. c. p. 293, Colorado Territory; *C. juncus*, l. c. p. 295, Illinois.

§ 3. Scutellum with pale markings; abdomen red, or red and black:—

C. iridescens, l. c. p. 296, and *C. soror*, ibid., Delaware.

§ 4. Scutellum black; abdomen red, or red and black:—

C. americanus, l. c. p. 297 and *C. alacris*, l. c. p. 307, Delaware and Illinois; *C. persimilis*, l. c. p. 298, *C. similis*, l. c. p. 299, *C. albitarsis*, l. c. p. 300, *C. pumilus*, l. c. p. 301, and *C. incertus*, l. c. p. 306, from Delaware; *C. linatus*, l. c. p. 298, Delaware and Virginia; *C. subargenteus*, l. c. p. 302, Pennsylvania; *C. pusillus*, l. c. p. 302, *C. frater*, l. c. p. 303, and *C. subgracilis*, ibid., Illinois; *C. extrematis*, l. c. p. 304, Massachusetts, Pennsylvania, Delaware; *C. ultimus*, l. c. p. 305, Colorado.

§ 5. Thorax, scutellum, and abdomen yellowish red:—

C. pallidus, l. c. p. 307, from Delaware.

Phygadeuon. The following seven new species of this genus are described by Cresson: *P. major*, l. c. p. 308, *P. cincticornis*, l. c. p. 309, *P. subfuscus*, l. c. p. 311, and *P. mandibularis*, ibid., from Illinois; *P. annulatus*, l. c. p. 308, Delaware; *P. montanus*, l. c. p. 309, Colorado Territory; *P. vulgaris*, l. c. p. 310, Pennsylvania, Delaware, Illinois.

Mesostenus. Of this genus Cresson describes five new North American species: *M. albopictus*, l. c. p. 312, Delaware; *M. albomaculatus*, l. c. p. 313, Pennsylvania; *M. thoracicus*, l. c. p. 314, Pennsylvania, Delaware, New York; *M. gracilis*, l. c. p. 315, Virginia; *M. ? fulvus*, l. c. p. 316, Illinois.

Rhyssa nortoni, sp. n., Cresson, l. c. p. 317, Colorado Territory; *R. albomaculata*, sp. n., Cress. l. c. p. 318, New Jersey; *R. nitida*, sp. n., Cress. l. c. p. 319, Virginia.

Grotea (g. n.) *anguina*, sp. n., Cresson l. c. p. 398, from New Jersey and New York, reared from a raspberry stem together with a small species of *Crabro*.

Labena (g. n.) *apicalis*, sp. n., Cresson, l. c. p. 402, from Delaware.

CHALCIDIDÆ.

Walker (Ent. Trans. l. c. p. 207) proposes the name *Eudoxinna* for the genus of Chalcidites described by him under that of *Sosxetra* in Ent. Trans. 3rd series, vol. i. p. 370, the latter name having been used by himself for a genus of Lepidoptera at p. 84 of the same volume.

Lucas describes *Torymus obsoletus* (Fab.) as the parasite of *Lophyrus pini*. Ann. Soc. Ent. Fr. 4^e série, tome iv. p. 216.

Walker (Trans. Ent. Soc. 3rd series, vol. ii. pp. 181-206) has described 44 new species of the genus *Smiera*, all collected by Bates in the valley of the Amazons. Many of the species appear to be very nearly allied. Their names are as follows: *Smiera concitata*, *certa* (p. 183); *efficta*, *contacta* (p. 184); *destinata* (p. 185); *crocata*, *appressa* (p. 186); *aperta*, *cerina* (p. 187); *basilica*, *composita* (p. 188); *admixta*, *defuncta* (p. 189); *adaptata* (p. 190); *correcta*, *ezinaniensis* (p. 191); *scissa*, *œmula* (p. 192); *adsita*, *attalica* (p. 193); *contermina* (p. 194); *commoda*, *alienata* (p. 195); *dimota*, *disposita* (p. 196); *expleta*, *descripta* (p. 197); *exhauriens*, *adjuncta* (p. 198); *blonda*, *vacillans* (p. 199); *terminalis*, *æqualis* (p. 200); *contributa*, *celsa* (p. 201); *detracta*, *annulifera* (p. 202); *depicta* (p. 203); *annexa*, *cognata* (p. 204); *demota*, *apparata* (p. 205); *deducta* and *attacta* (p. 206).

Chalcis eurytomoides, sp. n., Walker, Ent. Trans. l. c. p. 207, from the Amazons Valley.

Pteromalus macronychivorus, sp. n., Perez, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 631-635, pl. 14. figs. 16-20.

Siphonura gallæ quercus, sp. n., L. Duf. Ann. Soc. Ent. F. 4^e série, tome iv. p. 214, bred from the galls of *Diplolepis geniculata* (Duf.).

CYNIPIDÆ.

WALSH (Proc. Ent. Soc. Phil. vol. ii. pp. 443-462) has published some interesting observations leading to the conclusion that dimorphism occurs extensively in this family. In 1861 and 1862 Osten-Sacken described two species of *Cynips*, inhabiting perfectly similar galls on the Black Oak (*Quercus tinctoria*), under the names of *Cynips quercus spongifica* and *C. aciculata*. The latter form occurs only in autumn and winter, and only in the female sex; the former is met with in spring, and occurs of both sexes.

The galls, which present no perceptible difference, are developed upon the Black Oak in the spring simultaneously with the leaves, and no new galls make their appearance during the summer. When the galls are collected in May, about a half of them produce gall-flies, of the form *C. q. spongifica* of both sexes, in the month of June; the remainder, if preserved, produce females of *C. aciculata* in October and November, and a few in the following spring. From these facts and a long series of observations Walsh comes to the conclusion that *C. aciculata* is merely a second or dimorphous form of *C. q. spongifica*, notwithstanding the great differences, even of structure, which seem

to distinguish them. The evidence for the specific identity of the two forms is stated by Walsh as follows:—If we “suppose, for argument’s sake, that *aciculata* and *spongifica* are distinct species, then we are met immediately by the following difficulties:—1st. Is it likely that two distinct species of *Cynips* should produce, on the same species of oak, galls which are undistinguishable? 2nd. Is it likely that when *spongifica*, as above shown, is so local that it is only found in one station out of fifty near Rock Island, *aciculata* should select that particular station instead of some other of the remaining forty-nine? 3rd. If *aciculata* is a distinct species, then we are compelled to believe with Hartig in the existence of agamous species, *i. e.* of species that propagate from year to year *ad infinitum* without sexual intercourse with a distinct individual.”

With regard to the function of *C. aciculata* Walsh states that as the ♂ and ♀ of *C. spongifica* which come out in June only live from six to eight days, it is impossible that males should survive till October or till the following spring to copulate with the *aciculata* ♀. Hence he concludes, from analogy with Bees, &c., that “*aciculata* ♀ generates galls which produce by parthenogenesis male *spongifica* exclusively, and that female *spongifica* coupling in June with these males oviposit in the same month, in the young buds of the oak,—the eggs lying dormant till the following spring, when some of the eggs produce ♀ *spongifica* in June, and some ♀ *aciculata* in the autumn or early in the following spring, which last in their turn, as before mentioned, generate ♂ *spongifica* to appear in the following June.” These observations seem to point towards a solution of the mystery still surrounding the parthenogenetic reproduction of the *Cynipidæ*, whether the hypothesis propounded by the author should ultimately prove to be well-founded or not. His paper contains many interesting details with regard to the history of this group.

In an appendix (*l. c.* pp. 463–500) Walsh remarks on the relations between the true Gall-flies (*Psenides*) and the so-called Guest Gall-flies, or parasitic Cynipidæ (*Inquilinæ*), and discusses the classification of these interesting insects. Following Hartig and Reinhardt, he separates the *Cynipidæ* into two families, *Cynipidæ* and *Figitidæ*, for which he gives the following characters, *l. c.* pp. 468, 469:—

Cynipidæ. Venter visible nearly throughout its entire length ♂ ♀, more conspicuously so in ♀, or if retracted within the abdomen leaving a gaping suture below. The joint which is apparently the last ventral (ventral valve in ♀) very long, and forming in ♀ a sheath-like receptacle, convex below, concave above, which is occupied by the ovipositor. Sheaths of ovipositor erected in repose, either vertically or obliquely backwards and upwards, strongly divaricate with the ventral valve. Tip of ♀ abdomen bluntly and widely rounded or truncate. Tip of ♂ abdomen angular or subangularly

rounded, truncate only when the terminal segments are retracted, joints 4-7 being each vertically narrower than the preceding one. *Habits*, so far as known, gallivorous.

Figitidae. Venter retracted within abdomen, with the suture below barely perceptible, entirely internal and invisible in ♂ except a minute portion of its tip, entirely so in ♀ except the tip of the terminal joint, which is horny, vertically flattened, and acutely angular, and in close conjunction with the similarly shaped terminal dorsal joint forms an angular horny borer. Concealed between the dorsal and ventral pieces of this borer lie the ovipositor in its sheaths. Sheaths of ovipositor horizontally porrect. Tip of ♂ abdomen truncate, joints 4-7 being each vertically nearly as wide as the preceding one, except that joint 7 is often excised below, and shows underneath it a small portion of the tip of the last ventral. *Habits*, as far as known, insectivorous.

Walsh remarks that in both families the abdomen in the imago has but a single pair of stigmata, situated at the base of the seventh segment. He also states that *Ibalia* belongs to the *Cynipidae* (as restricted above), and does not form the type of a distinct family as Reinhardt supposes, and describes a new generic form (*Tribalia*) intermediate between *Cynips* and *Ibalia*. The author further enters upon a description of the anatomical structure and homologies of the *Cynipidae*, and especially of the intricate and difficult anatomy of the abdomen and ovipositor.

The characters of the subfamilies of *Cynipidae* (restricted) are given by Walsh as follows (*l. c.* pp. 477, 478):—

Subfam. *Psenides* (True Gall-flies). Wings with the second transverse vein so bent or incurved towards their base that the areolet is opposite the base of the radial area. Radial area scarcely ever closed by a prolongation of the costal vein. Sheaths of the ovipositor scarcely ever projecting beyond the tip of the dorsal valve. Ovipositor scarcely ever projecting from between the tips of the sheaths.

Subfam. *Inquilince* (Guest Gall-flies). Wings with the second transverse vein so straight that the areolet is nearly opposite the middle of the radial area. Radial area almost always more or less closed by a prolongation of the costal vein. Sheaths of the ovipositor always projecting more or less beyond the dorsal valve, generally projecting greatly. Ovipositor almost always projecting from between the tips of the sheaths.

Of this second subfamily Walsh characterizes the following three genera, to which he refers all the species of Guest Gall-flies observed by him in Illinois:—

Synophrus (*l. c.* p. 479). Antennæ ♂ 15-jointed, ♀ 14-jointed or 13-jointed, with the last joint long. Thorax glabrous before the scutellum; scutellum rugose. Pleura with a large highly polished spot under the wings. Abdominal peduncle rather indistinct, simple, and truncate-conical, widest behind. Second abd. segment forming nearly or quite the entire abdomen exclusive of peduncle.

Amblynotus (*l. c.* p. 479). Ant. ♂ 15-jointed, ♀ 12-jointed, last joint twice

as long as penultimate. Other characters as in *Synophrus*, but apparent 2nd abd. segment divided by an indistinct suture.

Synerges (l. c. p. 480). Ant. ♂ 15-jointed, ♀ 14-jointed or 13-jointed, with last joint long. Thorax transversely rugose; scutellum rugose. Pleura scarcely glabrous. Abdominal peduncle constricted in the middle, composed of two parts, the first a short cylinder, the second larger and conical, with the small end behind. Second abdominal segment forming nearly or quite the whole abdomen.

The arrangement of the genera of *Cynipidæ* (sens. lat.), according to Walsh, is as follows (l. c. p. 480, note) :—

Fam. CYNIPIDÆ.

Subfam. PSENIDES.

Genera: *Cynips*, Linn. (= *Diplolepis*, Geoff. = *Callaspidia*, Fitch nec Dahlb.); *Biorhiza*, Westw.; *Philonix*, Fitch; *Diastrophus*, Hart.; *Rhodites*, Hart.; *Ibalia*, Lat.; *Tribalia*, Walsh, n. g.

Subfam. INQUILINÆ.

Genera: *Synophrus*, Hart.; *Synerges*, Hart.; *Amblynotus*, Hart.; *Sarothrus*, Reinh.; *Aulax*, Hart.

Fam. FIGITIDÆ.

Genera: *Figites*, Lat.; *Onychia* (?), Hal.; *Callaspidia* (?), Dahlb.; *Allotria* (?), Westw.; *Kleidotoma* (?), Westw.; *Eucoila* (?), Westw.; *Ægilips* (?), Hal.

Walsh (l. c. pp. 481–494) furnishes a list of the Cynipidæ inhabiting various species of oaks in the State of Illinois, with descriptions of their galls, and of several new species :—

† Galls upon Leaves.

1. BLACK OAK (*Q. tinctoria*). *C. q. spongifica*, O. S., autumnal form *C. q. aciculata*, O. S. = *C. confluentus*, Harris, 1862 = *C. confluentus*, Harris, 1841. Guest Gall-fly, *Synophrus læviventris*, O. S.

2. RED OAK (*Q. rubra*). *C. q. inanis*, O. S. = *Callaspidia confluenta*, Fitch.

3. BLACK OAK. Gall of *C. q. pilulæ*; Gall-fly unknown; Guest Gall-fly *Amblynotus inermis*, n. sp.

4. WHITE OAK? Gall of *C. q. flocci*, probably indentical with *q. lana*, Fitch. *C. q. flocci*, n. sp. Guest Gall-fly *Synophrus albipes*, n. sp.

5. WHITE OAK. Gall of *C. q. erinacei* (= *q. pisum*, Fitch? = *pezomachoides*, O. S.?). Gall-fly *C. pezomachoides*, O. S.?. Guest Gall-fly *C. q. pisum*, Fitch? = *Synophrus læviventris*, O. S.?

6. RED OAK. Gall of *C. q. sculpta*, Bassett.

7. RED OAK. Gall of *C. nubilipennis*, Harris (= *C. q. singularis*, Bassett).

8. SWAMP WHITE OAK (*Q. prinus*, var. *discolor*). Gall of *C. q. petiolicola*, Bassett. Guest Gall-fly *Amblynotus ensiger*, n. sp.?

9. BLACK OAK and LAUREL OAK (*Q. imbricaria*). Gall of *C. q. palustris*, O. S.

† † Galls on Limbs, Twigs, &c.

10. WHITE OAK. Gall of *C. q. globulus*, Fitch. Guest Gall-fly *Synerges operatus*, Harris and Fitch.

11. WHITE OAK. Gall of *C. seminator*, Harris & O. S. Guest Gall-fly (?) *C. seminator*, Fitch (not Harris).

12. WHITE OAK. Gall of *C. q. ficus*, Fitch. Gall-fly (?) *C. q. forticornis*, n. sp. Guest Gall-fly *Synophrus læviventris*, O. S. (= *C. q. ficus*, Fitch?).

13. BLACK OAK. Gall of *C. q. podagræ*, n. sp. ? (= *C. q. punctata*, Bassett?). Guest Gall-flies *Synerges rhoditiformis*, n. sp., and *S. mendax*, n. sp.

14. WHITE OAK. Gall of *C. q. tuber*, Fitch. Gall-fly unknown. Guest Gall-fly *C. q. tuber*, Fitch?

15. BLACK-JACK OAK (*Q. nigra*). Gall of *C. q. operator*, O. S.

Besides new species Walsh describes of the *Inquilinae* *Synophrus læviventris*, O. S. l. c. p. 494.

Bassett remarks that the ♂ of his *Cynips q. singularis* (= *C. q. nubilipennis*, Harr.) and of *C. q. scitula*, n. sp., have 16 joints in the antennæ, and that the ♀ of *C. q. formosa*, sp. n., and *C. q. ventricosa*, sp. n., have 15 joints. Proc. Ent. Soc. Philad. vol. iii. p. 680.

The same author describes the following known species of *Cynips*: *C. q. batatus* (Fitch), and *C. q. tuber* (Fitch).

Some remarks on the habits of *Cynips aptera*, and on the relations of the sexes in the genus *Cynips*, by Saunders, Smith, and Westwood, are published in Proc. Ent. Soc. Lond. 1864, pp. 47, 48.

Lucas describes an agglomeration of galls of *Cynips* (*Apophyllus*) *aptera*. Bull. Soc. Ent. Fr. 1864, p. xxi.

Tribalia, g. n., Walsh, Proc. Ent. Soc. Philad. vol. ii. p. 470. Intermediate between *Rhodites* and *Ibalia*; antennæ ♀ 14-jointed, last joint not longer than penultimate; scutellum unarmed; abdomen much compressed, 1st dorsal joint much larger than any of the following ones, 2nd dorsal joint small, no dorsal valve; hind legs of moderate length. Sp. *T. batatorium*, Walsh.

New species:—

Tribalia (g. n.) *batatorium*, Walsh, Proc. Ent. Soc. Philad. vol. ii. p. 471, from Illinois.

Cynips. Of this genus Walsh describes as new species: *Cynips quercus flocci* ♀, l. c. p. 482; *C. q. forticornis* ♀, l. c. p. 490; and *C. q. podagræ* ♀ (= *C. q. punctata*, Bassett?), l. c. p. 492.

Bassett (Proc. Ent. Soc. Philad. vol. iii.) gives full descriptions of the following new North American species of *Cynips* and of the galls from which they are produced: *Cynips q. formosa*, l. c. p. 679, on *Quercus rubra*; *C. q. ventricosa*, l. c. p. 681, on *Q. ilicifolia*; *C. q. ilicifoliae*, l. c. p. 682, on the same; *C. q. majalis*, l. c. p. 683, on *Q. alba*; *C. q. scitula*, l. c. p. 683, on *Q. tinctoria*; *C. q. similis*, l. c. p. 685, on *Q. ilicifolia*; *C. q. hirta*, l. c. p. 688, on *Q. montana*. Bassett also describes two kinds of galls, the insects producing which are still unknown—one on the leaf-buds of *Q. chinquapin*, the other on the leaves of *Q. rubra*. For the Gall-fly of the former he proposes the name of *Cynips q. frondosa*, and for that of the latter *C. q. decidua*.

Cynips quercus strobilana, Osten-Sacken, Proc. Ent. Soc. Philad. vol. iii. p. 690. (The producer of the gall described in Proc. Ent. Soc. Philad. 1862, p. 254.)

Diplolepis geniculata, L. Duf. Ann. Soc. Ent. Fr. 4^e série, tome iv. p. 214, in galls on *Quercus tauzin*.

Synophrus albipes, Walsh, l. c. p. 496.

Amblynotus ensiger, Walsh (= *A. petiolicola*, O. S. ?), l. c. p. 496; and *A. inermis*, Walsh, l. c. p. 498.

Synergus mendax, Walsh, l. c. p. 498; and *S. rhoditiformis*, Walsh, l. c. p. 499.

URO CERIDÆ.

Hartig has observed the oviposition of *Sirex gigas* in the Black Forest between 6th and 14th August. Berl. ent. Zeitsch. 1864, p. 397.

Urococcus cressonii, sp. n., Norton, Proc. Ent. Soc. Philad. vol. iii. p. 16, from Pennsylvania.

TENTHREDINIDÆ.

Smith has published some observations tending to show that *Hemichroa alni* (Linn.) may be the male (hitherto unknown) of *Eriocampa ovata*. Ent. Ann. 1864, p. 113.

Frauenfeld records the occurrence of an enlargement of the egg previous to hatching in two species of this family, namely, *Nematus fuscus* (Lep.), found on the stems of *Stachys recta* (Lin.), and a species of *Tenthredo*, which produces a globular gall on willow-leaves at Trondhjem in Norway. Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 693.

Norton describes a variety of *Trichiosoma triangulum* (Kirby) from the Colorado (Proc. Ent. Soc. Philad. vol. iii. p. 5). Also the male of *Hylotoma abdominalis* (Leach), and a variety of the male of *H. scapularis* (Klug), l. c. p. 6. The same author describes a variety of *Hylotoma* (*Schizocerus*) *plumigera* (Klug) = *Cryptus klugii* (Leach), l. c. p. 7. *Allantus barda* (Say) is described as a *Selandria* by Norton, l. c. p. 9. Norton also describes varieties of *Allantus basilaris* (Say) and *Macrophya bicincta* (Nort.), l. c. p. 10, and of *Xyphidria tibialis* (Say), l. c. p. 16.

Lucas has described the transformations of *Lophyrus pini* (Fab.). Ann. Soc. Ent. Fr. 4^e série, tome iv. pp. 215, 216.

Snellen van Vollenhoven (Tijdschr. voor Ent. vii. deel, pp. 59-68) describes the transformations of *Cimbex connata* (Schr.), and figures it in its different states (pls. 1 & 2).

The same author also describes and figures *Nematus betulæ* (Hart.) and its transformations (l. c. pp. 70-74, pl. 3).

The 'Zoologist' contains translations of Snellen van Vollenhoven's life-histories of *Athalia spinarum*, pp. 9067-9072, and *Cimbex axillaris*, pp. 9262-9265.

Couper describes the habits of *Eurytoma fulvipes* (Fitch), which produces a sort of gall upon *Triticum repens* in the vicinity of Quebec. Can. Nat. & Geol. new series, vol. i. p. 444.

New species :—

Nematus vitreipennis (Eversm.), Kawall, Bull. Soc. Nat. Mosc. p. 295.

Tenthredo (*Macrophya*) *femoralis* (Eversm.), Kawall, l. c. p. 297; *T. (M.) magnicornis* (Eversm.), Kawall, ibid.; *T. (M.) angustula* (Eversm.), Kawall, ibid.; *T. (M.) ischiadica* (Eversm.), Kawall, l. c. p. 298.

Tenthredo. Of this genus Norton describes nine new North American species: namely, *Tenthredo pectoralis*, Proc. Ent. Soc. Philad. vol. iii. p. 11; *T. semirufus*, l. c. p. 12; *T. variegatus*, ibid.; *T. variatus*, ibid.; and *T. xanthus*, l. c. p. 13; all from the Colorado Territory; *T. angulatus*, ibid.; *T. formosus*, l. c. p. 14; and *T. semi-rubra* (sic) ibid., from Massachusetts; and *T. rufo-pedibus* (!), l. c. p. 15, from Pennsylvania.

Hylotoma ceruleus (sic), Norton, l. c. p. 5, from Pennsylvania.

Atomacera ruficollis, Norton, l. c. p. 6, from Pennsylvania.

Nematus marylandicus, Norton, l. c. p. 7, from Maryland; *N. sub-albatus*, Nort. ibid., from Pennsylvania; *N. brunneus*, Nort. l. c. p. 8, from the Colorado Territory; *N. erythrogaster*, Nort. ibid., from Massachusetts.

Messa hyalina, Norton, l. c. p. 8, from New Jersey.

Selandria medius (sic); Norton, l. c. p. 9, from New Jersey; *S. fasciatus* (sic), Nort. ibid., from Massachusetts.

Allantus uncinatus, Norton, l. c. p. 9, from the Colorado.

Macrophya tibiator (sic), Norton, l. c. p. 10, from Massachusetts and Connecticut; *M. zonalis*, Nort., l. c. p. 11, from Massachusetts.

Lyda brunnicans, Norton, l. c. p. 15, and *L. multisignatus* (sic), Nort. ibid., from the Colorado Territory.

LEPIDOPTERA.

A. Works in Progress.

SCOTT, A. W. Australian Lepidoptera and their transformations, drawn from the life, by HARRIET and HELENA SCOTT; with descriptions, general and systematic. Parts i. & ii. Folio. London: Van Voorst, 1864.

The title of this work sufficiently indicates its scope, and it is not too much to say that all parties concerned in its production deserve the very highest credit for the manner in which they have fulfilled their respective portions of the task. The drawings of the different Insects, with their larvæ, pupæ, and food-plants, are very well executed, the only unsatisfactory portions of the plates being the figures of details of structure, which are here and there somewhat defective. As the book is entirely produced in Sydney, it is interesting as an example of the highly creditable manner in which such work can now be executed in that distant colony. Several new species are described and figured in the parts already published.

WALKER, FRANCIS. List of the specimens of Lepidopterous Insects in the Collection of the British Museum. Parts xxix. and xxx. Tinctes (contin.), pp. 563-1096. Part xxxi. Supplement, pp. 321. Published by order of the Trustees, 1864.

The last part contains additional synonyms of species referred

to in previous parts, and numerous descriptions of new species from the collections of the British Museum and of Mr. W. Wilson Saunders.

STANTON, H. T. The Natural History of the Tineina. Vol. viii. By H. T. Stainton, assisted by Professor Zeller, J. W. Douglas, and Professor Frey. 1864. 8vo (pp. vii and 315, with 8 plates).

Mr. Stainton has continued his admirable work on the Tineina by the publication in the past year of an eighth volume, containing the natural history of 15 species of *Gracilaria* and 9 species of *Ornix*. The number of known species of the former genus is 43, and of the latter 22, as recorded by Stainton at pp. 12-15 and 208-211 of the present volume. This work is still published in four languages printed in parallel columns; the illustrations, as in the former volumes, are beautifully executed.

HEWITSON, W. C. Exotic Butterflies, being illustrations of new species selected chiefly from the collections of W. Wilson Saunders and William C. Hewitson. 4to. London: Van Voorst, parts 49 to 52 (January to October, 1864).

The four parts of this well-known work published during 1864 are devoted almost entirely to the *Nymphalidæ*, which occupy nine of the twelve plates of which they are composed; of the remainder, one contains representations of three species of *Papilio*, and the other two are occupied by species of the Satyride genus *Mycalesis*, chiefly from the Eastern Islands.

B. Papers published in Journals, &c.

AMYOT, C. J. B. Histoire de la Teigne syringelle (*Tinea syringella*, Fab.). Ann. Soc. Ent. Fr. 4^e série, tome iv. pp. 1-12. June 8, 1864 (read September 9, 1863).

BAR, CONSTANT. Quelques mots sur les *Morphos* de la Guyane, Lépidoptères de la tribu des Morphides. Ibid. pp. 29-33. June 8, 1864 (read April 22, 1863).

BATES, H. W. Contributions to an Insect Fauna of the Amazons Valley.—Lepidoptera—Nymphalinae. Journ. of Entom. vol. ii. pp. 175-213 (June 1864).

BATES, H. W. New species of Butterflies from Guatemala and Panama, collected by Osbert Salvin and F. Du Cane Godman. Entom. Monthly Mag. vol. i. pp. 1-6, 31-35, 55-59, 81-85, 113-116, 126-131, and 161-164.

BEHR, DR. On Californian Lepidoptera. No. III. Proc. Calif. Acad. Nat. Sci., December 1863, pp. 84-93.

This paper contains notes on species of *Danaïs*, *Argynnis*, and *Melitæa* found in California, with descriptions of new species.

BOWLES, G. J. On the occurrence of *Pieris rapæ* in Canada. Canadian Naturalist and Geologist, new series, vol. i. pp. 258-262.

CLEMENS, BRACKENRIDGE. North American Micro-Lepidoptera. Proc. Entom. Soc. of Philadelphia, vol. ii. pp. 415-430, March; vol. iii. pp. 505, December 1864.

CREWE, H. H. Notes on *Eupitheciæ*. Entomologists' Annual, 1865, pp. 117-127.

DIETRICH, J. K. Zur Naturgeschichte der *Heliothis armigera*. Mittheil. Schweiz. entom. Ges. November 1864, p. 258.

EDWARDS, W. H. Description of certain species of Diurnal Lepidoptera found within the limits of the United States and British North America. No. 3. Proc. Entom. Soc. of Philadelphia, vol. ii. pp. 501-507. March 1864.

EDWARDS, W. H. Descriptions of certain species of *Catocala* found within the United States. Proc. Entom. Soc. of Philadelphia, vol. ii. pp. 508-512. March 1864.

EDWARDS, W. H. Notes on the Argynnidæ of California. Proc. Entom. Soc. Phil. vol. iii. pp. 434-436. November 1864.

FELDER, C. et R. Species Lepidopterorum hucusque descriptæ vel iconibus expressæ, in seriem systematicam digestæ. Verh. zool.-bot. Gesellsch. in Wien, Bd. xiv. pp. 289-377.

The work here commenced is a synonymic catalogue of the species of Lepidoptera, with an Appendix containing numerous notes on the species and genera, and descriptions of some new forms. The part now published includes only the true Papilionidæ, of which the authors record 533 species, distributed under 10 genera.

FOLOGNE, E. Addenda au Catalogue des Lépidoptères de Belgique. Annales Soc. Ent. Belge, tome vii. pp. 87-93.

FOLOGNE, E. Variétés de Lépidoptères. Ann. Soc. Ent. Belge, tome vii. pp. 125, 126.

FOLOGNE, E. Premiers états de la *Gelechia rufescens* (Haw.). Ann. Soc. Ent. Belge, tome vii. pp. 127, 128.

FRASER, THOMAS R. On the Moth of the Esere or Ordeal-Bean of Old Calabar. Ann. & Mag. Nat. Hist. 3rd series, vol. xiii. pp. 389-394. May 1864.

GARTNER, A. Lepidopterologisches. Stettiner entom. Zeitung, 1864, pp. 155-160.

GRAAF, H. W. DE. Microlepidoptera in Nederland waargenomen. Bouwstoffen voor eene Fauna van Nederland, 3de Deel, pp. 189-226.

The continuation of a synonymic list of the Microlepidoptera

of Holland, with notes on the times of appearance and on the larvæ, and some remarks on the synonymy and varieties of the species. It contains 59 species of Crambina and 70 of Tineina.

GROTE, A. R. Description of a new species of North-American *Gortyna*; Descriptions of North-American Lepidoptera, No. 2; and Description of a new species of *Papilio*. Proc. Entom. Soc. of Phil. vol. ii. pp. 431-442, pl. 9. March 1864.

GROTE, A. R. Description of a new genus and species of North American Noctuina. Ibid. vol. iii. pp. 2-4. April 1864.

The author has appended a list of the recorded Noctuina of the group *Heliothidæ* found in North America.

GROTE, A. R. Descriptions of North-American Lepidoptera. Nos. 3-5. Ibid. pp. 73-92, pls. 1-3, June 1864; pp. 322-327, September 1864; pp. 521-535, pls. 5 & 6, December 1864.

GROTE, A. R. List of a Collection of Lepidoptera Heterocera taken near Williamsburg, Mass. Ibid. pp. 92-96. June 1864.

GROTE, A. R. Notes on certain species of North-American Lepidoptera. Ibid. pp. 535-542. December 1864.

GUENÉE, A. Notice sur la famille des *Enochromides*. Ann. Soc. Ent. Fr. 4^e série, tome iv. pp. 13-16. June 8, 1864.

GUENÉE, A. Note sur quelques espèces du genre *Colias*. Ibid. pp. 197-200. October 12, 1864.

HABERLANDT, FRIEDR. Ueber eine bisher wenig beobachtete Getreidemotte, *Tinea pyrophagella* (Koll.). Verh. zool.-bot. Gesellsch. in Wien, Bd. xiv. pp. 915-920.

HERRICH-SCHÄFFER, —. Prodrömus Systematis Lepidopterorum. Corresp.-Blatt des zool.-mineral. Vereines in Regensburg, Jahrg. 18, pp. 89-112, 123-136, 148-152, & 173-181. 1864.

HERRICH-SCHÄFFER, —. Die Schmetterlingsfauna der Insel Cuba. Ibid. pp. 159-172.

HEWITSON, W. C. Descriptions of new species of Diurnal Lepidoptera. Trans. Ent. Soc. London, 3rd series, vol. ii. pp. 245-249, plates 15 & 16. November 1864.

HEYDEN, C. VON. Ueber einen neuen Schmetterling aus der Gattung *Exapate* aus dem Oberengadin. Mittheil. Schweiz. entom. Gesellsch. February 1864, pp. 190, 191.

HUTTON, T. On the Reversion and Restoration of the Silkworm. Trans. Ent. Soc. Lond. 3rd series, vol. ii. pp. 143-173. August 1864 (read May 2, 1864).

HOFFMANN, —. Mittheilung bezüglich der Zucht der wilden Seidenraupe.. Yama-mayu (*Saturnia Cynthia*) in Japan. Translated by Haupt from the Dutch. Corresp.-Blatt zoolog.-mineral. Vereines in Regensburg, Jahrg. 18, pp. 62-80. 1864.

KEFERSTEIN, —. Einige Bemerkungen über die Schmetterlings-fauna von Reichenhall und Gastein. Stettiner entom. Zeitung, 1864, pp. 103-105.

KIRBY, W. F. Notes and Observations on European Butterflies. Entomologists' Annual, 1865, pp. 22-28.

KNAGGS, H. G. Notes on new and rare species of Lepidoptera (excepting Tineina) for 1863. Ibid. 1864, pp. 118-139.

KNAGGS, H. G. Notes on British Lepidoptera (excepting Tineina) for 1864. Ibid. 1865, pp. 97-116.

In these two papers Dr. Knaggs notices the new British species of the larger Lepidoptera detected in the years 1863 and 1864, and furnishes tables of the capture of rare species during the same period. The former communication contains descriptions of two new Noctuidæ by H. Doubleday, and the latter a notice of a supposed new species of *Apamea*. Both include several notes on various larvæ.

LA HARPE, J. C. DE. Suppléments à la Faune des Lépidoptères Suisse. Nouv. Mémoires Soc. Helv. Sci. Nat. vol. xx. pp. 81. 1864.

This paper contains numerous additional Swiss Lepidoptera, belonging to the groups *Phalenidæ*, *Pyralididæ*, *Crambidæ* and *Tortricidæ*, with remarks upon their distribution and synonymy, and with full descriptions of some of them. A few of the species referred to are new.

LA HARPE, J. C. DE. Remarques sur les Lépidoptères, principalement sur les Phalénites et les Microlépidoptères, recueillis par M. Meyer-Dür dans son voyage (1863) en Tessin et en Engadine, avec description des espèces nouvelles. Mittheil. Schweiz. entom. Gesellsch. February 1864, pp. 172-190.

The number of species collected in the vicinity of Lugano in the spring amounted to 65, of which 15 are enumerated, with notes on their characters and mode of occurrence, by De la Harpe. In the Engadine a far greater number of species was collected; and the captures present the more interest as they include species which pass the winter in the chrysalis state, and make their appearance in the spring within the first fortnight after the melting of the snow. De la Harpe enumerates 30 of the more interesting or less known species taken by Meyer-Dür during his excursion.

- LANG, A. M. Notes on the Diurnal Lepidoptera of North-western India (with descriptions of new species by F. Moore). Entom. Monthly Mag. vol. i. pp. 101-104, 131-133, and 181-183.

This paper contains a series of notes on the Butterflies observed by the author in North-western India, including notices of their habits and local distribution, and descriptions of the variations of certain species.

- LINTNER, J. A. Notes on some of the Diurnal Lepidoptera of the State of New York, with descriptions of their larvæ and chrysalides. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 50-64. May 1864.

- LINTNER, J. A. Notes on some *Sphingidæ* of the State of New York, with descriptions of their larvæ and pupæ. Proc. Ent. Soc. Philad. vol. iii. pp. 645-672. December 1864.

- MILLIÈRE, P. Note sur l'*Hemerostia renalis*. Ann. Soc. Ent. Fr. 4^e série, tome iv. pp. 195, 196, pl. 5. fig. 5. October 12, 1864 (read April 13, 1864).

- MÜHLIG, C. G. Zwei neue Gelechien und eine neue Coleophora. Stettiner entom. Zeitung, 1864, pp. 101, 102. (Transl. in Ent. M. Mag. vol. i. p. 47.)

- MÜHLIG, C. G. Zur Naturgeschichte der Coleophoren. Stettiner entom. Zeitung, 1864, pp. 160-165.

- PACKARD, A. S. Synopsis of the *Bombycidæ* of the United States. Proc. Ent. Soc. Philadelphia, vol. iii. pp. 97-130. June 1864.

- PACKARD, A. S. Synopsis of the *Bombycidæ* of the United States. Part II. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 331-396. October 1864.

This paper includes descriptions of several new genera and species, besides remarks on the synonymy of known species.

- PACKARD, A. S. Notes on the family Zygaenidæ. Proc. Essex Institute, vol. iv. pp. 7-47, plates 1 and 2. (April 1864).

- PHILIPPI, R. A. *Eudelia rufescens*, Ph., ein neuer Spinner von Chili. Stett. entom. Zeitung, 1864, pp. 91-93.

- REAKIRT, T. Contributions towards a monograph of the genus *Crocota*. Proc. Entom. Soc. of Philadelphia, vol. ii. pp. 371-373. February 1864.

- REAKIRT, T. Descriptions of three new species of *Limacodes*. Ibid. vol. iii. pp. 250-252. September 1864.

- REAKIRT, T. Notes upon Exotic Lepidoptera, chiefly from the Philippine Islands, with descriptions of some new species. Ibid. pp. 443-504. December 1864.

In this paper the author has described 33 species of *Papilio*-

nide, chiefly belonging to the restricted genus *Papilio*, from various parts of the Old World, especially the Philippine Islands. His object is to furnish his countrymen with easily accessible descriptions of those insects, accompanied by a full synonymy of each species. A few new species are described, one of them the type of a new genus. Reakirt also gives a sketch of the views of Horsfield and MacLeay on the natural classification of the *Papilionida*.

SAUVEUR, J. Notes Entomologiques. Annales Soc. Ent. Belge, tome vii. pp. 75-85.

SAUVEUR, J., ET COLBEAU, J. Des variations normales de l'aile dans l'espèce chez quelques Lépidoptères. Annales Soc. Ent. Belge, tome vii. pp. 53-74, plate 2.

SAUVEUR, J., ET FOLOGNE, E. Liste des Tinéides de la Belgique. Annales Soc. Ent. Belge, tome vii. pp. 95-117.

SCHLEICH, —. Ueber die früheren Entwicklungsstände des *Pterophorus didactylus* (Linn., Ev.), *trichodactylus* (Hübner). Stettiner entom. Zeitung, 1864, pp. 96-98.

SNELLEN, P. C. T. Quelques remarques sur le Catalogue des Lépidoptères d'Europe et des pays limitrophes, de MM. Staudinger et Wocke. Tijdschrift voor Entom. vii. pp. 174-204. Haarlem, 1864.

Contains numerous important observations on the synonymy of the European Lepidoptera.

STAINTON, H. T. A few words on the species of *Pterophorus* noticed by Linné. Entom. Monthly Mag. vol. i. pp. 11-14.

STAINTON, H. T. Observations on Tineina. Entomologists' Annual, 1864, pp. 163-171, and 1865, pp. 132-142.

STAINTON, H. T. New British Tineina. Ibid. 1865, pp. 128-131.

The former of these papers consist of notes, chiefly on the preparatory states of various species of Tineidæ; the latter contains descriptions of three newly detected British species of that family.

STAINTON, H. T. On the European species of the genus *Cosmopteryx*. Trans. Ent. Soc. London, 3rd series, vol. i. pp. 637-655. March 1864 (read November 2, 1863).

TRIMEN, ROLAND. Descriptions of some new species of Butterflies found in Southern Africa. Ibid. vol. ii. pp. 175-180. August 1864 (read July 4, 1864).

TRIMEN, ROLAND. On the Butterflies of Madagascar. Quarterly Journal of Science, vol. i. pp. 648-654.

WALKER, FRANCIS. Catalogue of the Lepidopterous Insects collected at Sarawak, in Borneo, by Mr. A. R. Wallace,

with descriptions of new species (continued). Proc. Linn. Soc. vol. vii. pp. 160-198.

WAHNSCHAFTE, MAX. Der Frass des Kahn-Eichenwicklers (*Tortrix viridana*, Linné) im Berliner Thiergarten vom Jahre 1863. Berliner entom. Zeitsch. 1864, pp. 313-317.

WEIDEMEYER, J. W. Catalogue of North-American Butterflies. 8vo, pp. 42. Reprinted from the Proc. Entom. Soc. Philad. 1863 & 1864.

WESTMAAS, DE ROO VAN. Première éducation du ver à soie du chêne (*Bombyx (Antheraea) yama-mai*) en Néerlande. Tijdschrift voor Entomologie, vii. Deel, pp. 75-110, pl. 4-6. Haarlem 1864.

WOCKE, F. Ein Beitrag zur Lepidopternfauna Norwegens. Stettiner entom. Zeitung, 1864, pp. 166-192, & 201-220.

WULLSCHLEGEL, J. Ergänzungen zu "Wilde's Pflanzen und Raupen Deutschlands." Stettiner entom. Zeitung, 1864, pp. 193-195, & 304, 305.

Anatomical and Physiological Papers.

BALTZER, A. Zur Anatomie und Physiologie der Dämmerungsfalter (Sphingidæ). Archiv für Naturgesch. 1864, pp. 154-190, Tafel iv.

BARTHÉLEMY, AIMÉ. Des Monstruosités naturelles et provoquées chez les Lépidoptères. Ann. Sci. Nat., cinquième sér. tom. i. pp. 225-228, pl. 10 B. (1st April, 1864.)

Barthélemy has experimented upon the pupa of *Bombyx mori*, by applying to it a covering of varnish, wax, or oil, in order to see whether, during this second embryogeny, effects could thus be produced analogous to those manifested in the egg of the fowl when similarly treated. By such applications to the anterior parts of the pupa, he succeeded in causing an arrest of the development of the cephalic and thoracic portions of the insect; but his most remarkable results were obtained by the local compression of the pupa. By this means individuals were obtained almost completely acephalous; and, singularly enough, these had the generative organs unusually developed, and manifested a great desire for copulation. By the compression of the extremity of the abdomen the development of the generative organs was prevented; and in this case the moths showed but little vigour. In some instances the anal aperture was obstructed, and the moth, being unable to evacuate the meconium by its natural outlet, voided a blackish liquid from the mouth.

DUFOUR, LÉON. Recherches anatomiques et physiologiques sur les Insectes Lépidoptères. Comptes rendus, tome lix. pp. 65-67.

1864. [VOL. I.]

General remarks on the order :—

Wocke has published a report of the results of his collecting in Norway, Stett. ent. Zeit. 1864, pp. 166 & 201. The total number of species of Lepidoptera recorded by him is 202, of which 166 were collected on the Dovrefjeld. Of the twelve species of Butterflies found here, nine also occur in Finmark, including *Syrichthus centaureæ*, also an inhabitant of North America. Of truly northern species there were only three; the rest occur in Germany and Switzerland. The *Zyganidæ* are represented on the Dovrefjeld by a single species (*Z. exulans*); the *Sphingidæ* are entirely wanting; a single pupa-case, probably of *Sesia culiciformis*, was met with; and the *Hepialidæ* are represented by two common European species, *Spilosoma fuliginosa* and *Hepialus humuli*. Of *Bombycidæ* Wocke met with nine species, all of which are also found in Germany. Of 24 species of *Noctuidæ*, 19 also occur in Germany and Switzerland; but six of these are peculiar to the Alpine region. Wocke describes two new species of this family, and mentions the occurrence on the Dovrefjeld of *Anarta algida* (Lef.), a species hitherto known only from N. America. *Agrotis speciosa* (Hüb.) varies greatly in this northern locality, so that two species might easily be made out of it, and Wocke regards *A. arctica* (Staud.) as founded upon one of these northern varieties. *Hadena exulis* (Lef.) occurs on the Dovrefjeld, and is identical with *H. marmorata* (Zett.) *Herminia tentacularis* (Lin.) occurs on the Dovrefjeld with a very unusual coloration, which is described by Wocke (*l. c.* p. 186). Of the *Geometridæ*, of which the total number recorded is 36, 25 occurring on the Dovrefjeld, only one, *Eupithecia hyperborea*, is exclusively a northern form, all the others occurring in Germany. Out of a total of 106 species of *Microlepidoptera*, 95 are found on the Dovrefjeld; of these only 12 are truly northern species, the rest being common to the German fauna, but nine of them peculiar to the Alps. The six *Pterophoridaæ* are all German species. Wocke describes *Conchylis vulnerata* (Zett.) and *Argyresthia decimella* (Staint.) from good specimens, and refers to varieties of other known species, some of which may prove to be specifically distinct. The few new species described will be noticed below in their proper places.

KEFERSTEIN (Stett. ent. Zeit. 1864, pp. 103–105) reports on the general characters of the Lepidopterous fauna of Reichenhall and Gastein, in Bavaria, and gives a list of species found by him in the former place from 13th July to 11th August, and in the latter from 6th July to 4th August. He confined his attention to the Rhopalocera and larger Heterocera. He remarks especially on the number of species of *Lycæna* (six) which he saw flying together in the Käferthal near Gastein, and notices some variations in the marking of *L. alexis* and *L. corydon*, one of which represented *L. alexius* (Freyer).

Wulschlegel (Stett. ent. Zeit. 1864, pp. 193 & 304) publishes his observations on the periods of occurrence and food-plants of numerous larvæ belonging to different groups of Lepidoptera, and describes the larva of *Polia nigrocincta*, var. *nivescens* (Staud.).

Captain Cox has communicated to the Entomological Society some "Notes on collecting Lepidopterous larvæ," with the sketch of a tabular arrangement for recording captures. Ent. Trans. 3rd ser. vol. i. Proc. pp. 186-189.

The variations presented by Lepidopterous insects, both in the larva and perfect states, are classified by Jordan (Ent. M. Mag. vol. i. pp. 53-55), and the importance of their study indicated.

H. G. Knaggs has published some instructions on collecting and breeding Lepidoptera in Ent. M. Mag. vol. i. pp. 65-70, and, 97-100, on the collecting and management of the eggs.

Barrett (Ent. M. Mag. vol. i. pp. 93, 94) describes his experience of collecting Lepidoptera from thatch.

Grote (Proc. Ent. Soc. Phil. vol. iii. pp. 74, 75) gives a list of some species of Lepidoptera from Arctic America, collected by Kennicott. The species mentioned are: *Macroglossa thysbe* (Fab.); *Clisiocampa americana* (Harr.); *Lithosia bicolor* (Grote); *Arctia parthenos* (Harr.) = *borealis* (Möschl.) = *americana* (Walk.); *Pygæra inclusa* (Hübner.); *Noctua augur* (Fab.); *Scoliopteryx libatrix* (Lin.); *Anarta brephoides* (Walk.); *Botys octomaculata* (Lin.); *Metrocampa perlata* (Guen.); *Cidaria diversilineata* (Hübner.); *C. obducata*? (Möschl.); and *C. hastata* (Lin.).

The same author (*l. c.* pp. 92-96) publishes a list of 105 species of Heterocerous Lepidoptera taken in the vicinity of Williamsburg, Massachusetts, including in a note (*l. c.* p. 93) a list of the N. American species of *Anisota* (Hübner.) = *Dryocampa* (Harr.).

Gascoyne notes the gradual reappearance of certain species of Lepidoptera which had been rare in the valley of the Trent since the inclement year 1860. Ent. M. Mag. vol. i. pp. 74, 75.

C. G. Barrett gives a note of the more remarkable species of Lepidoptera met with by him at Rannoch, in Perthshire, in July 1861. Ent. M. Mag. vol. i. pp. 44-46.

J. B. Hodgkinson publishes a list of Lepidoptera captured by him in Westmoreland in 1863. Zoologist, 1864, pp. 8992-8997.

Sauveur has published a series of notes on the occurrence of certain species of Lepidoptera in various parts of Belgium, with a list of additions and suppressions to be made in the catalogue of Belgian Lepidoptera. Ann. Soc. Ent. Belge, vii. pp. 87-93.

Pologne likewise publishes a long list of addenda to the Lepidopterous fauna of Belgium, some of which are referred to by Sauveur in his paper. This list includes 31 species of Tineidæ. Ann. Soc. Ent. Belge, vii. pp. 87-93.

*Bar (Bull. Soc. Ent. Fr. 1864, p. xxiv) records the occurrence upon a sloth of numerous parasitic insects resembling bugs in appearance, but which proved on examination to belong to the Lepidoptera. He does not mention the group to which they belong.

General notes :—

RHOPALOCERA.

BATES (Journ of Entom. ii. p. 176) proposes the following classification of the Rhopalocera in families and subfamilies :—

Family 1. *NYMPHALIDÆ*. Front legs imperfect in both sexes; in the ♀ wanting the tarsal claws; in ♂ the fore tarsi quite rudimentary, consisting of one or two spineless joints. Pupa suspended freely by the tail.

a. Lower disco-cellular nervule of hind wing perfect.

Subfam. 1. *Danaïnæ*. Larvæ smooth, with fleshy processes. Fore-wing submedian nervure double at its origin.

Subfam. 2. *Satyrinæ*. Larvæ with bifid tails, spineless. Palpi of imago generally compressed and fringed with long hair-scales.

Subfam. 3. *Brassolinæ*. Larvæ generally with bifid tails, spineless. Hind wing with a prediscoidal cell.

Subfam. 4. *Acræinæ*. Larvæ with branched spines. Palpi of imago thick and scantily clothed with hair.

Subfam. 5. *Heliconinæ*. Larvæ with branched spines. Palpi of imago clothed with fine scales, hairy in front.

b. Lower disco-cellular nervule, at least of hind wing, more or less atrophied.

Subfam. 6. *Nymphalinæ*.

Family 2. *ERYCINIDÆ*. Six perfect legs in ♀; in ♂ four, the anterior tarsi of one or two joints and spineless.

Subfam. 1. *Libythæinæ*. Pupa suspended freely by the tail.

Subfam. 2. *Stalachtinæ*. Pupa secured rigidly by the tail in an inclined position without girdle.

Subfam. 3. *Erycininæ*. Pupa recumbent on a leaf or other object, secured by the tail and a girdle across the middle.

Family 3. *LYCÆNIDÆ*. Six perfect legs in ♀; in ♂ four, the anterior tarsi wanting one or both of the claws, but densely spined beneath. Pupa secured by the tail and a median girdle.

Family 4. *PAPILIONIDÆ*. Six perfect legs in both sexes. Pupa secured by the tail and a median girdle.

Subfam. 1. *Pierinæ*. Abdominal margin of hind wings not curved inwards.

Subfam. 2. *Papilioninæ*. Abdominal margin of hind wings curving inwards.

Family 5. *HESPERIDÆ*. Six perfect legs in both sexes; hind tibiæ generally with two pairs of spurs. Pupa secured by many threads, or enclosed in a slight cocoon.

HERRICH-SCHÄFFER has commenced (Corresp.-Blatt zool.-mineral. Ver. Regensb. 1864) an analytical classification of the Lepidoptera on the model of his well-known 'Nomenclator Entomologicus.' The instalment published in 1864 relates exclusively to the Diurnal Lepidoptera, and contains an analytical table of the families (sixteen in number) into which H.-Schäffer divides the Rhopalocera, similar tables of the genera

belonging to the first ten families, and the commencement of a systematic index of the species. The tables are disfigured by numerous abbreviations, or rather by the use of initial letters, for an explanation of which we are referred to a previous part of the "Correspondenz-Blatt," an arrangement which is exceedingly inconvenient, and cannot be of any great typographical advantage. The table of families is as follows (abridged):

- I. Pupa suspended by posterior extremity; imago with undeveloped fore legs.
 1. Median cell of hind wings extending furthest on 4th, 5th, or 7th vein, closed; vein 8th of fore wings running into the margin or the rounded apex.
 - A. Basal veins of the fore wings not inflated.
 - a. Hind wings with no basal cell 1. *Heliconina*.
 - b. Hind wings with a narrow basal cell 2. *Danaina*.
 - c. Hind wings with a large basal cell . . 3. *Brassolina*.
 - B. Basal veins of fore wings all or partly inflated.
 - a. Hind wings with a narrow basal cell 4. *Biina*, H.S.
 - b. Hind wings with no basal cell.
 - α . Costal of hind wings reapproaching the subcostal beyond the origin of the postcostal; dorsal of fore wings forked towards base 5. *Heterina*, H.S.
 - β . Costal of hind wings constantly removing from subcostal; dorsal of fore wings not forked 6. *Satyrina* a.
 2. Median cell of hind wings projecting furthest at the common point of origin of veins 3 & 4, or open.
 - A. Costal and subdorsal, sometimes also dorsal, of fore wings inflated; median cells closed *Satyrina* b.
 - B. Costal only of fore wings very strongly inflated.
 - a. Median cell of all wings closed 7. *Elymnina*, H.S.
 - b. Median cell of hind wing open or hardly perceptibly closed.
 - α . Branch 8 of fore wings in anterior margin.
 8. *Ragadina*, H.S.
 - β . Branch 8 of fore wings in the border.
 9. *Eurytelina*.
 - C. Costal and subdorsal rarely a little inflated 10. *Nymhalina*.
 - II. Pupa suspended by the tail; imago with undeveloped fore legs in ♂. Median cell of hind wings open; branch 8 of fore wings running into anterior margin 11. *Libytheina*.
 - III. Pupa suspended by the tail and fastened by a thread round the middle; fore legs undeveloped in ♂; median cells of all wings closed.
 12. *Erycinina*.
 - IV. Pupa as in III.; fore legs developed in both sexes.
 1. Hind wings with the full number of veins.
 - A. Hind wings without a postcostal; median cell closed between branches 4 & 6 13. *Lycanina*.
 - B. Hind wings with a postcostal; median cell extending furthest upon branch 4 14. *Peridina*.
 2. Hind wings emarginate on inner margin, so that vein 1 a is deficient.
 15. *Equitina*.

- V. Pupa in a loose web; imago with fully developed legs and twelve separate veins in the fore wings 16. *Hesperidina*.

In the arrangement of the genera, Herrich-Schäffer departs in many respects from his predecessors. He transfers *Euplaea* and *Hestia* from the Danaïna to the Heliconina, with which they certainly do not so closely agree; his family Danaïna thus includes only the genus *Danaïs*. The genera *Caligo*, *Dasyophthalma*, *Opsiphanes*, *Dynastor*, *Penetes*, and *Narope* are grouped with *Brassolis* in the family Brassolina; *Bia* and *Ragadia* are separated as types of new families, as is also *Hætera* (*Hetæra*, H.S.); with the last-mentioned genus *Cithærias* and *Pierella* are associated. The family Elymniina includes only the genus *Elymnias*, with which H.-Schäffer regards *Dyctis* as identical. The Eurytelina include, besides *Eurytela* and *Hypanis* (Bdv.), the genera *Didonis*, *Cystineura*, *Olina*, and *Ergolis* (West.); and the Nymphalina, the last family of which the analysis is here given, consists of an assemblage of no fewer than 113 genera, and must be regarded simply as the rough residue from which the smaller groups just mentioned have been cut away. Herrich-Schäffer, indeed, indicates a series of thirteen groups, which he thinks may hereafter be raised to the rank of families. The characters of two new genera are given in this family.

HERRICH-SCHÄFFER has published (Corresp.-Blatt zool.-mineral. Ver. Regensb. 1864, pp. 159-172) a complete list of the Rhopalocerous Lepidoptera observed by Gundlach in Cuba during a residence of twenty-five years in that island. Gundlach states that the Cuban Lepidoptera were handed over for determination and description to A. Lefebvre, by whom they were mixed with specimens from other West-Indian islands, so that when they afterwards came to be described by Lucas in Ramon de la Sagra's great work on the natural history of Cuba, there could be no certainty that the species really occurred there. As Gundlach has zealously collected the Lepidoptera of the island in all districts during his residence in Cuba, he thinks there is little doubt that the species observed by him furnish a fair indication of the nature of the Diurnal species at any rate; and if this be the case, one is struck, as Herrich-Schäffer remarks, by the poverty of this tropical island when compared with countries of equal extent elsewhere. In the present paper, which is not completed, Herrich-Schäffer gives a list of the Cuban species of eight of his families. Of the Heliconina, which might have been expected to swarm, only four species occur; and of the Danaïna (= *Danaïs*) only two, one of which is the widely-distributed *D. archippus*. The most remarkable circumstance is the almost total absence of Satyrina, of which only a single species has been noticed by Gundlach, whilst 49 are recorded by Weidemeyer as inhabiting the northern and central parts

of continental America. Of the Nymphalina (H.-Sch.) we find 36 species, belonging to 27 genera; *Argynnis*, *Brenthis*, *Grapta*, *Vanessa*, and *Limenitis* are unrepresented. The Libytheina have but one representative, and the Erycinina are wholly deficient. The Lycænina also are very poorly represented by 12 species, four of which belong to *Lycæna* and seven to *Thecla*. Of the Pieridina Herrich-Schäffer records 31 species, 16 of which belong to *Terias* and eight to *Callidryas*. Of the Equitina (H.-Sch.) 11 species of *Papilio* are recorded; Weidemeyer catalogues 79 species of that genus from North and Central America. The Hesperidina are commenced; the species are said to be numerous, and many of them new. Remarks on the characters and synonymy of many of the species are appended to their names.

TRIMEN has described the general characters of the Rhopalocera of Madagascar. The total number of known species of Butterflies inhabiting that island is stated by him at 73, belonging to 34 genera and 11 families. All these families are represented in Africa. The *Ageronidæ*, *Heliconidæ*, *Brassolidæ*, and *Morphidæ* are wanting in Madagascar and also on the African continent. Not one of the genera is peculiar to the island, and of the 73 species 45 occur elsewhere; and 39 of these are inhabitants of Africa (27 exclusively). The number of species common to Madagascar and the Mascarene islands is 15; but the latter contain eight species not yet found in the great island, two of which, however, occur in continental Africa. The number occurring both in Madagascar and Asia is 12, but 11 of these are also inhabitants of Africa. Thus the conditions presented by the Rhopalocerous Lepidoptera are in striking contrast to those indicated by Scater as presented by the Mammalia, being in strict accordance with what might have been expected from the geographical position of the island.

WEIDEMEYER has published in the 'Proceedings of the Entomological Society of Philadelphia' a "Catalogue of North-American Butterflies," now reprinted in a separate form. The arrangement is that of Doubleday and Westwood's 'Genera of Diurnal Lepidoptera'; and the genera of which no species occur in North America are inserted in their proper places, with a note that they are unrepresented. The author has, however, adopted a plan which diminishes the value of his work, by almost entirely ignoring the works of Linné and Fabricius, on the ground that recent discoveries have rendered their descriptions "unreliable and of little value"; accordingly we find the species named by those authors attributed to the first writer who has given recognizable descriptions or figures of them. The synonymy of the species is reduced to the smallest possible compass, but some useful remarks on the species are appended to each family.

Kirkpatrick has given a "List of the Diurnal Lepidoptera found in the vicinity of Cleveland, Ohio" (Proc. Ent. Soc. of Philadelphia, vol. ii. pp. 328 & 329), containing remarks on some of the species. The number of species recorded is 44: namely, *Papilio* 7, *Pieris* 1, *Colias* 1, *Danaus* 1, *Argynnis* 4, *Terias* 1, *Melitæa* 1, *Vanessa* 4, *Grapta* 2, *Pyrameis* 3, *Nymphalis* 2, *Neonympha* 2, *Argus* 1, *Polyommatus* 4, *Thecla* 2, *Hesperia* 3, *Nisoniades* 2, *Goniloba* 1, and *Pamphila* 2.

Kirby (Ent. Annual, 1865, pp. 22-28) gives a list of several species of European Butterflies as a supplement to his 'Manual,' and notices the larvæ of others.

Wallace's paper read before the Linnean Society, "On the phenomena of variation and geographical distribution, as illustrated by the *Papilionidæ* of the Malayan region," is printed in abstract in Nat. Hist. Rev. 1864, pp. 459-467.

SAUVEUR and COLBEAU have commenced (Ann. Soc. Ent. Belge, tome vii. p. 53) an elaborate series of researches into what they call the *normal variations* of the wing in the Lepidoptera, this term being applied by them to those variations which occur with a certain degree of persistency in a considerable number of individuals of the same species. Their first memoir is devoted exclusively to the consideration of the variation in the colour and markings of the wings in *Satyrus arcanius* (Lin.); the different conditions of the fore and hind wings, both above and below, are described by them in detail, and represented in numerous figures on plate 2.

Papilionides.

C. & R. Felder, in the first portion of their Catalogue of Lepidoptera (Verh. zool.-bot. Ges. in Wien, xiv. pp. 239-377), register 533 species of *Papilionides* arranged under the genera *Teinoprosopus*, *Leptocircus*, *Papilio* (divided into 75 sections characterized in the appendix), *Euryades*, *Eurycus*, *Parnassius*, *Doritis*, *Thais*, *Scricinus*, and *Hypermnestra*. The genus *Ornithoptera* of Boisduval is combined with *Papilio*; *Teinopalpus* (Hope) is altered to *Teinoprosopus*, the former name being a hybrid compound.

W. MacLeay states (Proc. Ent. Soc. N. S. W. 1863, p. xxii) that *Papilio antinoüs* (Don.) has been erroneously given by Doubleday and Westwood as a synonym of *P. turnus*.

Hewitson figures *Papilio numicus* (Hopffer), Exot. Butt. *Papilio*, pl. 6. fig. 17.

Bates (Ent. M. Mag. vol. i. p. 2) describes the ♀ of *Papilio numitor* (Cram.).

Lintner records the dates of appearance in New York, and describes the metamorphoses of the following species of this group (Proc. Ent. Soc. Phil. vol. iii.): *Papilio turnus*, l. c. p. 50; *P. asterias* and *P. troilus*, l. c. p. 51.

Lucas describes the geographical distribution of *Papilio machaon*, which is found, with some little variation, throughout the Old World, from Western Europe and North Africa to Pekin. Bull. Soc. Ent. Fr. 1864, p. v.

REAKIRT (Proc. Ent. Soc. Phil. vol. iii.) describes numerous known species of *Papilionides* from the eastern hemisphere, and gives full synonymy and particulars of geographical distribution.

The species are *Ornithoptera rhadamanthus* (Luc.), l. c. p. 444; *Papilio erastion* (Hübner), l. c. p. 447; *P. memnon* (Lin.), l. c. p. 449, with full descriptions of its numerous varieties; *P. antiphus* (Fab.), l. c. p. 455; *P. alcinoüs* (Klug), l. c. p. 456; *P. bianor* (Cram.), l. c. p. 457; *P. ganessa* (Doubt.), l. c. p. 458; *P. paris* (Lin.), l. c. p. 459; *P. argus* (Horsf.), l. c. p. 460; *P. palinurus* (Fab.), l. c. p. 463; *P. helenus* (Lin.), l. c. p. 464; *P. pammon* (Lin.), l. c. p. 466; *P. polytes* (Lin.), l. c. p. 468; *P. alphenor* (Cram.), l. c. p. 470; *P. demoleus* (Lin.), l. c. p. 471; *P. erithonius* (Cram.), l. c. p. 472, with descriptions of two varieties, one of which is new; *P. erectheus* (Don.), l. c. p. 476; *P. agamemnon* (Lin.), l. c. p. 478; *P. eurypylyus* (Lin.), l. c. p. 481; *P. sarpedon* (Lin.), l. c. p. 483; *P. xuthus* (Lin.), l. c. p. 486; *P. machaon* (Lin.), l. c. p. 488; *P. dissimilis* (Lin.), l. c. p. 490; *Leptocircus meges* (Zinck. Somm.), l. c. p. 494; *Eurycyus cressida* (Boisd.), l. c. p. 495; and *Sericinus montela* (Gray), l. c. p. 497.

New genera and species :—

Atrophaneura, Reakirt, Proc. Ent. Soc. Philad. vol. iii. p. 446. Allied to *Ornithoptera*; fore wings subtriangular, inner margin not more than half length of costa; upper disco-cellular nervule less than space between discoidal nervules, third subcostal nervule thrown off at end of cell, median and submedian nervures united by an interno-median. Sp. *A. erythrosoma*, Reakirt, p. 447, from the Philippines.

Euryades, Felder, Verh. zool.-bot. Gesellsch. in Wien, xiv. pp. 327 & 376. Allied to *Papilio*; antennæ stout, with a thick club; male generative organs exposed, those of the female with a large corneous appendage, as in *Eurycyus*; venation of the wings nearly as in *Papilio hector*. Sp. *E. duponchelii* (Luc.), *E. corethrus* (Lac., Boisd.).

Ornithoptera cassandra, A. W. Scott (Trans. Ent. Soc. N. S. W. i. p. 131, pl. 10), from Port Denison. (Read 7 Dec. 1863.)

Papilio epycides, Hewits. Exot. Butt. Jan. 1864, *Papilio*, pl. 6. fig. 16, from N. India; *P. zalmoxis*, Hewits. l. c. fig. 18, from Calabar; *P. hewitsonii*, Westw. (= *P. slateri*, Hewits.), Proc. Ent. Soc. Lond. 1864, p. 10, from Borneo; and *P. calverleyi*, Grote, Proc. Ent. Soc. Phil. vol. ii. p. 441, pl. 10, from New York.

Papilio. Reakirt describes the following new species of this genus (Proc. Ent. Soc. Phil. vol. iii.): *Papilio lorquini*, l. c. p. 462; *P. varasi*, l. c. p. 465; and *P. moorei*, l. c. p. 485; all from the Philippines.

Papilio. C. & R. Felder (Verh. zool.-bot. Ges. in Wien, Bd. xiv.) describe the following new species of this genus (incl. *Ornithoptera*): *P. cronius*, pp. 290 & 332, from New Guinea (= *O. priamus* var., De Haan); *P. oceanus*, ibid., from Woodlark Island (= *O. boisduvalii*, Montr.); *P. titon*, ibid., from Rawak (= *P. priamus* var., Q. & G.); *P. toxaris*, pp. 294 & 337, from Venezuela (= *P. erithalion* ♂, Gray); *P. gundlachianus*, ibid., from Cuba (= *P. columbus*, Gundl. H. Sch.); *P. deicoon*, pp. 300 & 342, from Brazil (= *P. dolicaon*, Hübner, &c.); *P. telesilaus*, pp. 301 & 345, from Brazil (= *P. protesi-laus*, Hübner, &c.); *P. doson*, pp. 305 & 350, origin unknown (= *P. jason*, Hübner); *P. arion*, ibid., from Silhet (= *P. eurypylyus*, Hübner); *P. medon*, pp. 306 & 351, from New Guinea, &c. (= *P. codrus* var., De Haan); *P. brasilius*, pp. 307 & 353, from S. Africa (= *P. leonidas* var., Gray); *P. telesicles*, pp. 308 & 355, from Borneo (= *P. paradoxa* var., Hew.); *P. hippocrates*, pp. 314 & 362, from Japan (= *P. machaon* var., De Haan); *P. amphilaus*,

pp. 321 & 369, from Australia (= *P. ilioneus*, Don.); *P. dehaanii*, pp. 323 & 371, from Japan (= *P. bianor* var., De Haan); *P. phlegon*, p. 326, from Mindanao (= *P. annæ* ♀, Feld. olim).

Bates (Ent. M. Mag. vol. i.) describes the following new species from Guatemala: *Papilio belesis*, l. c. p. 1; *P. chrysodamus*, ibid.; *P. electryon*, l. c. p. 3; *P. calliste*, ibid.; *P. lacandonæ*, l. c. p. 4; *P. glaucolaus*, ibid.; and *P. salvinii*, ibid.

Papilio belemus, Bates, l. c. p. 2, note, from Pará.

Papilio govindra, Moore, Ent. M. Mag. vol. i. p. 101, note, from Kussowlie, N.W. India (= *P. agestor*, Koll.).

Parnassius uralensis, Felder, l. c. p. 329, from the Ural (= *P. phæbus* var., Ménétr.).

Leptocircus wilsonii, Reakirt, l. c. p. 495, from the Philippines.

Sericinus cressonii, Reakirt, l. c. p. 499, from China.

Pierides.

Guenée discusses the question of the specific identity or distinctness of *Colias hecla* (Lefebv.) and *C. boothii* (Curt.), which have been regarded by most modern writers as belonging to the same species. He comes to the conclusion that they are quite distinct. *C. hecla* (Lefebv. & Zetterst.) is figured by Herrich-Schäffer as *C. boothii* in his figs. 459 & 460, and is recorded in Staudinger's Catalogue under the same name; *C. boothii* is represented by Herrich-Schäffer in figs. 39 & 40. *C. chione* (Curt.) is a variety of the male of *C. boothii*. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 198 & 199.

Kirby (Ent. Ann. 1865, pp. 24 & 28) also maintains the distinctness of *C. hecla* and *C. boothii*, and thinks that there may be a third nearly allied arctic species.

The times of appearance and metamorphoses of *Pieris oleracea* and *Colias philodice* are described by Lintner, Proc. Ent. Soc. Phil. vol. iii. pp. 52 & 54.

Lucas describes some small individuals of *Anthocharis cardamines* found in April at Torre delle Isole, in Sicily. They are only from three-fifths to two-thirds of the size of normal specimens, and differ also in some minute points of coloration. Bull. Soc. Ent. Fr. 1864, p. xiii.

Lucas mentions the occurrence of *Pieris rapæ* and *P. daplidice* among insects received from Pekin. Bull. Soc. Ent. Fr. 1864, p. ix.

Bowles records the occurrence of *Pieris rapæ* in Canada, but states that, from its distribution, it has evidently been introduced. Canad. Naturalist and Geologist, new ser. vol. i. p. 258.

Thestias ænippe. This species is said by Lang to be subject to considerable variation, apparently due to difference of altitude and other local circumstances. The larva feeds on species of *Capparis*. Ent. M. Mag. vol. i. p. 103.

The larvæ of *Pieris napi*, *Anthocharis cardamines*, and *Gonepteryx rhamni* are described by Newman, Entomologist, vol. ii. pp. 61, 73, & 74.

New species :—

Pieris nasturtii (Boisd. MS.), Edwards, Proc. Ent. Soc. Phil. vol. ii. p. 501, from San Francisco; *P. vernalis*, Edwards, l. c. p. 501, from New Jersey.

Eronia varia, Trimen, Ent. Trans. 3rd ser. vol. ii. p. 175, from Caffraria.
Leptalis virgo, Bates, Ent. M. Mag. vol. i. p. 5, and *L. albania*, Bates, l. c. p. 6, from Guatemala.

Euterpe ochracea, Bates, l. c. p. 31, from Guatemala.

Hesperocharis graphites, Bates, l. c. p. 32, from Guatemala.

Terias longicauda, Bates, l. c. p. 32, from Guatemala.—*Terias conjungens*, H.-Schäffer, Regensb. Corr.-Blatt. 1864, p. 167, from Cuba.

Gonepteryx gobrias, Hewitson, Ent. Trans. 3rd ser. vol. ii. p. 246, pl. 16. fig. 1, from Borneo.

Colias rossii, Guenée, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 199, from the Arctic regions. (♀ Var. *C. nastes*.)

Danaides.

Danaïs archippus is said by Behr (Proc. Cal. Acad. Nat. Sci. 1863, p. 184) to occur throughout California "up to the limits of Lepidopterous life, 10,500 feet above the level of the sea."

Danaïs strigosa, sp. n., Bates, l. c. p. 32, from Guatemala.

Heliconides.

Dircenna darcyllidas, sp. n., Hewitson, Ent. Trans. l. c. p. 248, pl. 16. fig. 4, from New Granada.

Mechanitis lycidice, sp. n., Bates, Ent. M. Mag. vol. i. p. 33, and *M. doryssus*, Bates, ibid., from Guatemala.

Ithomia. Of this genus Bates describes the following new species: *Ithomia (Ceratinia) cleis*, l. c. p. 33, and *I. dorilla*, l. c. p. 35, from Panamá; *I. psyche*, l. c. p. 34, *I. salvinia*, ibid., and *I. cassotis*, l. c. p. 35, from Guatemala.

Melinea imitata, sp. n., Bates, l. c. p. 55, from Guatemala.

Tithorea duenna, sp. n., Bates, l. c. p. 56, from Guatemala.

Heliconius. Bates describes the following new species of this genus:—From Panamá—*Heliconius jucundus*, l. c. p. 56; *H. magdalena*, l. c. p. 57; and *H. chioneus*, l. c. p. 58. From Guatemala—*H. verapacis*, l. c. p. 57; *H. galanthus*, l. c. p. 58. From Chimborazo—*H. sprucei*, l. c. p. 57, note.

Acræides.

Acræa. Four new species are described by Bates:—From Guatemala—*Acræa guatemalena*, l. c. p. 58; *A. leucomelas*, l. c. p. 59; *A. nox*, ibid. From Chimborazo—*A. equatoria*, l. c. p. 59, note.

Nymphalides.

Edwards (Proc. Ent. Soc. Phil. iii. pp. 434–436) gives an abstract of Behr's notes on Californian *Argynnides*, with descriptions of some species described by him in 1862. The species recorded as inhabiting California are: *Argynnis calippe* (Boisd.); *A. coronis* (Behr); *A. leto* (Behr); *A. astarte* (Dblld.); *A. montivaga* (Behr); *A. rupestris* (Behr); *A. adiate* (Boisd. MS.); *A. monticola* (Behr); and *A. zerene* (Boisd.). (For references to some of these species, see below.)

A variety of *Argynnis euphrosyne* is described and figured by Capronnier. Ann. Soc. Ent. Belge, tome vii. p. 123, pl. 3. fig. 6.

Edwards has described the female of *Argynnis diana* (Cram.), of which the male only was previously known. Proc. Ent. Soc. Phil. vol. iii. p. 431.

BATES (Journ. of Ent. ii. pp. 177-185) has some valuable observations upon the classification and habits of the *Nymphalinae*, and on their distribution in the Valley of the Amazons. He includes the *Morphidae* and *Eurytelidae* in this subfamily, of which he has found about 160 species, belonging to 41 genera, in the Amazons region. Of these, 73 are referred to in the published portion of his paper.

Known species, occurring in California, referred to by Behr (l. c.) are: *Argynnis antithore* (Boisd.); *Melitæa palla* (Boisd.); *M. chalcodon* (Dblld.); *M. anicia* (Dblld.); *M. editha*, (Boisd.).

Melitæa. BEHR remarks (Proc. Cal. Acad. 1863, p. 92), on the geographical distribution of this genus, that it consists essentially of northern forms, and has its centre of abundance in the temperate zone. It possesses no antarctic species, and its southern limit nearly coincides with the tropic of Cancer. Of the types into which the genus may be divided, California possesses two which are wanting to Europe, and Europe one (that of *M. cinxia*) which is absent in California. The Californian species are the giants of the genus, and further remarkable for the brightness of their coloration. The European and American species of the genus are all distinct, and even those occurring on the eastern and western sides of the American continent seem to be different.

Trapp remarks upon the different localities inhabited by *Melitæa artemis* and *M. merope*, and especially upon the fact that Benteli was unable to rear the latter form in Berne from the caterpillars brought down from the high Alps, as evidence that the two insects belong to two distinct species. Mittheil. Schw. ent. Ges. 1864, pp. 263, 264.

Bates (l. c. p. 189) describes a local variety of *Melitæa liriopæ* (Cram.) under the name of *M. pastazena*; it is from the banks of the Pastaza, in Eastern Ecuador. According to him, *M. cocyta* (Cram.) is identical with *M. tharos* from North America.

Bates (l. c. p. 191) also describes the several varieties of *Eresia eunice* (Hübner), of which the female is identical with *E. pella* (Hewits.). The same author describes (p. 196) the two sexes of *Lunica mygdonia* (God.) and (p. 200) the male of *E. sophonisba* (Cram.), and also gives a description of the species figured by Doubleday and Hewitson under the name of *Catagramma cynosura* (l. c. p. 208).

Edwards states with regard to Boisdual's *Melitæa pulchella* from California, that it is probably one of the dark-coloured species described by Dr. Behr, but that it is impossible to decide which. Proc. Ent. Soc. Phil. vol. ii. p. 504.

MacLeay (Proc. Ent. Soc. N. S. W. p. xxvii) states that *Charaxes caphontis* (Hewits.) is a native of the Fiji Islands, and not of Australia as stated by Hewitson.

Seghers describes the development of the dwarf variety (*oides*, Dahl) of

Vanessa io (Lin.), and ascribes the production of these diminutive forms to insufficiency of nourishment. Ann. Soc. Ent. Belge, tome vii. pp. 141 & 142.

Lintner records the times of appearance and describes the transformations of several species of this group occurring in New York (Proc. Ent. Soc. Phil. vol. iii.): *Grapta comma* (Harr.), l. c. p. 55; *G. faunus* (Edw.), l. c. p. 57; *G. progne* (Fab.) and *G. j-album* (God.), l. c. p. 58; *Vanessa antiopa* (Lin.), l. c. p. 59; *V. milberti* (God.), l. c. p. 61; *Limenitis arthemis* (Drury), l. c. p. 62; *L. disippus* (God.), l. c. p. 63; and *Pyrameis huntera* (Abb. & Sm.), l. c. p. 63.

Hewitson figures a variety of *Catagramma bonplandii*, Exot. Butt. Jan. 1864, Catagr. pl. 10. fig. 72.

Hewitson figures *Romaleosoma zampa* (Westw.), Exot. Butt. July 1864, figs. 1 & 3.

E. Newman (Entomologist, vol. ii.) describes the larvæ of *Argynnis paphia* (p. 77) and *Vanessa C-album* (p. 79).

New genera and species :—

Microtia, Bates, Ent. Month. Mag. vol. i. p. 83. Allied to *Melitæa*; antennæ stout, club abrupt, thick, obtuse, slightly curved; thorax small; wings elongated, margins entire and rounded; legs strongly spined beneath. Sp. *M. elca*, sp. n., Bates, l. c. p. 83, from Guatemala and Nicaragua.

Procris, Herr.-Schäffer, Corr.-Blatt. Regensb. 1864, p. 111. Allied to *Limenitis*; branch 3 in fore wings nearly as far from 4 as 2 from 3. Type not stated, probably *Papilio procris* (Cram.). The name *Procris* is preoccupied in Lepidoptera.

Algia, Herr.-Schäffer, l. c. p. 125. Allied to *Lachnoptera*; branches 3 and 4 of fore wings distinctly pedunculated; branch 7 divided by 8 and 9, which are very close together. Type not stated.

Argynnis. Behr (Proc. Cal. Acad. 1863, p. 84) gives the following names to Californian species of this genus characterized by him in a former article:—*Argynnis montivaga*, Behr (*Argynnis*, No. 4, Proc. Cal. Acad. 1862, p. 174); *A. rupestris*, Behr (described, =No. 6, l. c.); and *A. monticola*, Behr (=No. 8, l. c.).

Argynnis jainadeva, Moore, Ent. M. Mag. vol. i. p. 131, note, from Kuna-war, Himalayas, at an elevation of 10000 feet.

Argynnis hesperis, Edwards, Proc. Ent. Soc. Phil. vol. ii. p. 502, from the Rocky Mountains; *A. epithore* (Boisd. MS.), Edw. l. c. p. 504.

Argynnis coronis, Behr (in Edwards's Notes on Argynnides of California), Proc. Ent. Soc. Phil. iii. p. 435, from California.

Melitæa pallida, Edwards, Proc. Ent. Soc. Phil. vol. ii. p. 505, from Texas and Kansas; *M. phaon*, Edw. l. c. p. 506, from Georgia.

Melitæa. Behr describes the following new Californian species of this genus:—Type I. (*M. thuros*): *M. montana*, Behr. l. c. p. 85 (= *M. pyrrha*, Dbld.?), "disc [of under side of wings] uniform fulvous, the markings of the upper side shining through the coloration of the disc"; *M. collina* Behr, l. c. p. 86, "disc orange-colour; markings very perceptible, and towards the exterior margin bordered by a series of black spots"; *M. campestris*, Behr, ibid., "disc with a yellow spot between the first and second primary costa, and bordered towards the exterior margin by an angular row of yellow spots,

which are themselves bordered at the inner side by deep black"; *M. prattensis*, Behr, *ibid.*, "disc ochre-yellow, with irregularly diluted spots, and some black marks near the posterior margin." Type II. (*M. Athalia*): *M. whitneyi*, Behr, *l. c.* p. 88, Alæ supra rubricantes, nigro clathratæ, posticæ subtus lunulæ fasciæ submarginalis ocellis omnino destitutæ; *M. gabbi*, Behr, *l. c.* p. 89, Alæ ♂ supra ut in *M. palla*, feminae fasciis transversis alternantibus luteis et fulvis, totæ nigro clathratæ; alæ inferiores ut in *M. palla*, sed maculæ radicales candidæ pruinaque argentea renitentes ita ut fascia intermedia lunulæque marginales; *M. hoffmanni*, Behr, *ibid.*, Alæ usque ad medium nigræ maculis luteis fulvisque obsitæ, a media ala luteæ marginem versus fulvescentes plus minus nigro clathratæ. Type III. (*M. phaeton*): *M. cooperi*, Behr, *l. c.* p. 90, Alæ supra ut *M. chalcedontis*, subtus inferiores sulphureæ fasciis et maculis ordinariis fuscis, maculis fasciæ submarginalis fuscis concoloribus, neque ullo halone circumdatæ; *M. quino*, Behr, *ibid.*, *M. chalcedonti* similis, sed antennæ clava fusca, alæ serie macularum submarginalium in anticis rubra et marginalium in posticis flava rubro tincta; *M. nubigena*, Behr, *l. c.* p. 91, *M. aniciæ* similis, sed antennarum clava nigrescens, et subtus in alis posticis fasciæ pallidæ intermedia bipartitæ pars exterior aurantiaca, ut fascia lunularum quæ sequitur eam. Type IV. *M. leannira* (Boisd. MS.), Behr, *l. c.* p. 91, Antennæ totæ fulvæ, alæ supra nigræ fasciis macularibus duabus et radicem versus maculis tribus quadrangularibus omnibus gilvescentibus instructæ.

Melitæa. Bates describes the following new species of this genus:—From Guatemala—*Melitæa ptolyca*, Ent. M. Mag. vol. i. p. 81; *M. alethes*, *l. c.* p. 82; *M. tulcis*, *ibid.*; and *M. stesilea*, *ibid.* From Panama—*M. lelex*, *l. c.* p. 81.

Melitæa fragilis, Bates, Journ. of Ent. ii. p. 189, and *M. amazonica*, Bates (*ibid.* p. 190), from the Amazons.

Synchlœa. Four new species from Guatemala are described by Bates: *Synchlœa gaudialis*, *l. c.* p. 84; *S. erodyle*, *ibid.*; *S. tellas*, *ibid.*; *S. melanarge*, *l. c.* p. 85.

Eurema godmanii, Bates, *l. c.* p. 85, from Guatemala.

Eunica modesta, Bates, *l. c.* p. 113, from Guatemala.

Epiphile plutonia, Bates, *l. c.* p. 113, from Guatemala.

Temenis sylphis, Bates, *l. c.* p. 113, from Guatemala.

Ageronia. Bates describes the following new species from Guatemala: *Ageronia glauconome*, *l. c.* p. 114; *A. guatemalena*, *l. c.* p. 115; *A. atlantis*, *ibid.*; and *A. iphthime*, *l. c.* p. 116.

Pyrrhozyra otolais, Bates, *l. c.* p. 126, from Guatemala and Mexico.

Heterochroa. The following new species from Guatemala are described by Bates: *Heterochroa celerio*, *l. c.* p. 127 (also on the Amazons); *H. paræca*, *ibid.*; *H. iphicleola*, *l. c.* p. 128; *H. pithys*, *ibid.*; and *H. melanthe*, *l. c.* p. 129.

Heterochroa spruceana, Bates, *l. c.* p. 129, note, from the western valleys of Chimborazo.

Timetes corita, Bates, *l. c.* p. 129, from Guatemala.

Apatura thaumas, Bates, *l. c.* p. 130, and *A. argus*, Bates, *ibid.*, from Guatemala.

Amphirene superba, Bates, *l. c.* p. 161, from Guatemala.

Paphia nobilis, Bates, *l. c.* p. 162, *P. excellens*, Bates, *ibid.*, and *P. xenica*, Bates, *l. c.* p. 163, from Guatemala.

Agraulis andicola, Bates, *Journ. of Ent.* ii. p. 187, note, from the western slopes of Chimborazo.

Epeorea eupolis, Hewitson, *Ent. Trans. l. c.* p. 247, pl. 16. fig. 2, from Rio Janeiro.

Eueides euryaces, Hewitson, *l. c.* p. 248, pl. 16. fig. 3, from Quito.

Eresia. The following new species of this genus are figured and described by Hewitson, *Exot. Butt.* Jan. 1864, *Eresia*, pl. 3: *Eresia datis*, *l. c.* fig. 14, from New Granada; *E. acraëna*, *l. c.* fig. 15, from the Upper Amazons; *E. myia*, *l. c.* figs. 16 & 17, from Mexico; *E. ofella*, *l. c.* figs. 18 & 19, and *E. ithomioides*, *l. c.* fig. 20, from New Granada. And in the same work, April 1864: *Eresia orthia*, *l. c.* pl. 4. figs. 21-22 from Minas Geraes; *E. orobia*, *l. c.* figs. 23 & 24, and *E. velica*, *l. c.* figs. 25 & 26, origin not stated; *E. verena*, *l. c.* figs. 27 & 28, from Bolivia; *E. ezra*, *l. c.* fig. 29, origin not stated; *E. simois*, *l. c.* pl. 5. figs. 30 & 31, from Brazil; *E. hermas*, *l. c.* fig. 32, habitat unknown; *E. smerdis*, *l. c.* figs. 33 & 34, and *E. ardys*, *l. c.* figs. 35 & 36, from Mexico; *E. abas*, *l. c.* figs. 37 & 38, from New Granada; *E. aceta*, *l. c.* pl. 6. figs. 39 & 40, from New Granada; *E. anieta*, *l. c.* figs. 43 & 44, and *E. acesas*, *l. c.* figs. 48 & 49, from Venezuela; *E. gyges*, *l. c.* figs. 45 & 46, from Jamaica; *E. otanes*, *l. c.* fig. 47, from Guatemala; and *E. dicoma*, *l. c.* figs. 41 & 42, of unknown origin.

Eresia aveyrona, Bates, *l. c.* p. 192, pl. 10. fig. 4; *E. clara*, Bates, *ibid.*, figured by Cramer as *E. nauplia*; *E. cincta*, Edwards, *Proc. Ent. Soc. Phil.* vol. ii. p. 502, from Texas and Florida.

Laogona lilea, Hewitson, *Ent. Trans. l. c.* p. 246, pl. 15. figs. 5 & 6, from E. Indies.

Junonia. The following new species from the Zambesi are described and figured by Hewitson, *Exot. Butt.* July 1864: *Junonia elgiva*, *l. c.* fig. 1; *J. chapunga*, *l. c.* figs. 2 & 3; *J. cuama*, *l. c.* figs. 4 & 5; and *J. artaxia*, *l. c.* fig. 6.

Helcyra hemina, Hewitson, *Ent. Trans. l. c.* p. 245, pl. 15. fig. 1, from India.

Catagramma. Hewitson describes *Catagramma felderi*, *Exot. Butt.* Jan. 1864, *Catagramma*, pl. 10. figs. 68 & 69, from the Upper Amazon; *C. ceryx*, *l. c.* figs. 70 & 71, from Cuença; and *C. pasithea*, *l. c.* figs. 73 & 74, from Ecuador.

Limenitis labotas, Hewitson, *Ent. Trans. l. c.* p. 245, pl. 15. fig. 2, from Menado; *L. ligyes*, Hewits, *l. c.* p. 246, pl. 15. figs. 3 & 4, from N. India.

Limenitis trivena, Moore, *Ent. M. Mag.* vol. i. p. 133, note, from Himalayas, at 7000-8000 feet elevation.

Romalæosoma luperca, Hewits, *l. c.* July 1864, *Romal.* pl. 1. figs. 2 & 4, from Calabar; *R. losinga*, Hewits, *l. c.* fig. 5, from Congo.

Harma hemeresia, Hewits, *Exot. Butt.* July 1864, *Harma*, pl. 1. figs. 1 & 2, and *H. theodota*, *l. c.* figs. 3 & 4, from Calabar.

Euryphene. Hewitson describes and figures the three following new species of this genus (*Exot. Butt.* Oct. 1864, *Euryph.* pl. 1): *Euryphene soemis*, *l. c.*

figs. 1 & 2, and *E. theognis*, l. c. figs. 3 & 4, from Ashantee; and *E. lesbonax*, l. c. figs. 5 & 6, from the Niger.

Charaxes argynnides, Westw. Proc. Ent. Soc. Lond. 1864, p. 10, from the Zambesi.

Eunica malvina, Bates, l. c. p. 195, pl. 9. fig. 2, from the Amazons Valley; *E. evelide*, Boisd. MS., Bates, l. c. p. 197, note, from New Granada; *E. veronica*, Bates, l. c. p. 198, pl. 9. fig. 1, *E. pusilla*, Bates, ibid., pl. 9. fig. 5, and *E. viola*, Bates, l. c. p. 199, pl. 9. fig. 4, from the Amazons Valley.

Nica sylvestris, Bates, l. c. p. 204, from the Upper Amazons.

Catagramma miles, Bates, l. c. p. 207, and *C. amazona*, Bates, l. c. p. 209, pl. 10. fig. 5, from the Amazons.

Antigonis felderi, Bates, l. c. p. 210, pl. 10. figs. 2 & 3, from the Upper Amazons.

Pandora regina, Bates, l. c. p. 213, from S. Paulo, Upper Amazons.

Morphides.

Bar (Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 29-33) describes the habits of the species of *Morpho* observed by him in Guiana, in correction of statements published by Guenee on the authority of Lacordaire. The species observed by him during a residence of eleven years were nine in number, namely, belonging to the

Perscus group, 3 sp., *M. hecuba*, *metellus*, and *telemachus*.

Adonis group, 1 sp., *M. eugenia*.

Achilles group, 3 sp., *M. achilles*, *deidamia*, and *nestor*.

Menelaüs group, 1 sp., *M. menelaüs*.

Rhetenor group, 1 sp., ♂ *M. rhetenor*, ♀ *M. andromachus*.

M. rhetenor, according to Bar, differs so much from the rest of the species, that it might form the type of a new genus. *M. hecuba* and *M. metellus* are true species, and not females of other species; the author has both sexes of both of them. He gives a detailed description of *M. eugenia* (Boisd.), l. c. p. 32. In opposition to the statements of Lacordaire, the author affirms that the *Morphos* do not usually fly at any great height, but the elevation varies with the groups. In the groups *Rhetenor*, *Perseus*, and *Adonis* the flight is highest, from eight to twelve metres above the ground; in the other two groups the insects rarely fly at a greater elevation than from two to three metres.

Morpho octavia, sp. n., Bates, l. c. p. 163, from Guatemala.

Brassolides.

Brassolis strix, sp. n., Bates, l. c. p. 164, from Guatemala; *B. isthmia*, sp. n., Bates, ibid., from Panama.

Satyrides.

Hewitson remarks of *Mycalesis dora*, "When I named this species, I considered that it was sufficiently different from *dejanira*, and so it is with us, though not so on the continent. I have therefore renamed it."

E. Newman (Entomologist, vol. ii.) describes the larvæ of *Satyris megæra* (p. 81), *S. hyperanthus* (p. 82), *Chortobius darus* (p. 83), and *C. pamphilus* (p. 89).

New species :—

Mycalesis. Hewitson describes the following new species of this genus (Exot. Butt. Oct. 1864, *Mycalesis*, pls. 5 & 6) : *Mycalesis maianias*, pl. 5. figs. 27 & 28, from Malacca and Sarawak; *M. mynois*, l. c. figs. 29 & 30, from Timor; *M. dinon* (= *M. dexamenus* ♀, var., Hewits.), l. c. fig. 31, from Macassar; *M. mnasicles*, l. c. figs. 32 & 33, and *M. orseis*, pl. 6. figs. 36 & 37, from Sumatra; *M. milyas*, l. c. fig. 34, from the White Nile; *M. lalassis*, l. c. fig. 35, from Gilolo; *M. oroatis*, l. c. figs. 38 & 39, from Java; and *M. onatas*, l. c. fig. 40, from the Neilgherries.

Erebia sabacus, Trimen, Ent. Trans. l. c. p. 176, from Cape Colony and Caffraria.

Lasiommata lasus, Hewitson, Ent. Trans. l. c. p. 248, pl. 16. fig. 5, from Australia; *L. leprea*, Hew. l. c. p. 249, pl. 16. figs. 6 & 7, from Australia.

Pronophila latifica, Bates, l. c. p. 164, from Guatemala.

Erycinides.

The larva of *Nemeobius lucina* is described by Newman, Entomologist, vol. ii. p. 113.

Lycanides.

A variety of the male of *Lycæna alexis* is described and figured by Sauveur, Ann. Soc. Ent. Belge, tome vii. p. 120, pl. 3. fig. 1.

Bellier de la Chavignerie describes a variety of the ♂ of *Lycæna escheri*, Bull. Soc. Ent. Fr. 1833, p. lii.

E. Newman (Entomologist, vol. ii.) describes the larvæ of *Polyommatus hippothoe* (p. 90) and *P. phlaeas* (p. 121).

Liphyra, g. n., Westw. Proc. Ent. Soc. Lond. 1864, p. 31. Body short and thick; eyes large; palpi minute, last joint oval, acute; antennæ gradually clavate from the middle; legs all perfect, tibiæ without spurs, claws entire; wings large, obtuse, postcostal vein in anterior 4-ramose, two branches before the apex of the discoidal cell, the other two between the cell and the apex of the wing; cell closed. *L. brassolis*, sp. n., Westw., from Assam and Singapore.

New species :—

Lycæna echo, Edwards, Proc. Ent. Soc. Phil. vol. ii. p. 506, from California; *L. lycea*, Edw. l. c. p. 507, from the Rocky Mountains; *L. hintza*, Trimen, Ent. Trans. l. c. p. 177, from Caffraria.

Zeritis chrysaor, Trimen, l. c. p. 177, from Cape Colony and Caffraria; *Z. pyroëis*, Trim. l. c. p. 178, from Cape Town; and *Z. phosphor*, Trim. ibid., from Caffraria.

Iolais sidus, Trimen, l. c. p. 176, from Caffraria and Natal; *I. bowkeri*, Trimen, ibid., from Caffraria.

Thecla martialis, H.-Schäffer, Regensb. Corr.-Blatt. 1864, p. 164, from Cuba.

Hesperiiides.

Bellier de la Chavignerie describes a variety of *Hesperia comma* ♂. Bull. Soc. Ent. Fr. 1863, p. lii.

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New species :—

Hesperia nemoris, Edwards, Proc. Ent. Soc. Phil. vol. ii. p. 507, from Portsmouth, Ohio.

Pyrgus asterodia, Trimen, Ent. Trans. l. c. p. 178, from Cape Colony; *P. sataspes*, Trim. *ibid.*, from Cape Colony and Caffraria.

Pyrgus crisia, H.-Schäffer, Regensb. Corr.-Blatt. 1864, p. 171, from Cuba.

Cycloptides inornatus, Trimen, l. c. p. 179, from Caffraria.

Pamphila zeno, Trimen, l. c. p. 179, and *Pamphila? niveostriga*, Trim. *ibid.*, both from Caffraria.

Leucochitonea bicolor, Trimen, l. c. p. 180, from Caffraria.

Cuprona canopus, Trimen, l. c. p. 180, from Caffraria and Natal.

Nisoniades kobela, Trimen, l. c. p. 180, from Caffraria; *N. braco*, H.-Schäff. l. c. p. 171, *N. brunnea*, H. Schäff. l. c. p. 172, *N. concolor*, H.-Schäff. *ibid.*, and *N. undulatus*, H.-Schäff. *ibid.*, from Cuba.

SPHINGIDÆ.

Lintner (Proc. Ent. Soc. Phil. vol. iii.) describes the metamorphoses of 16 species of this family inhabiting the State of New York. The species are: *Sphinx quinquemaculata* (Steph.), l. c. p. 648; *S. cingulata* (Fab.), l. c. p. 650; *S. cinerea* (Harr.), l. c. p. 655; *S. kalmia* (Abbot & Smith), l. c. p. 657; *S. drupiferarum* (Abbot & Smith), l. c. p. 658; *Sphinx* ———?, l. c. p. 652; *Philampelus satellitia* (Lin.), l. c. p. 659; *P. achemon* (Drury), l. c. p. 660; *Deilephila chamænerii* (Harr.), l. c. p. 661; *D. lineata* (Fab.), l. c. p. 662; *Darapsa myron* (Cram.), l. c. p. 663; *Ceratonia quadricornis* (Harr.), l. c. p. 664; *Smerinthus excecatus* (Abb. & Sm.), l. c. p. 665; *S.* ———?, l. c. p. 666; *S. juglandis* (Abb. & Sm.), l. c. p. 668; and *Ellema harrisii* (Clemens), l. c. p. 669. Lintner also gives a list of the species of Sphingidæ inhabiting the State of New York, the transformations of which are unknown.

Piochard de la Brulerie describes a variety of *Macroglossa stellatarum*. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 666.

Walker describes the following species as new: *Macroglossa vacillans* (List Lepid. xxxi. p. 27), from Timor; *M. approximata* (*ibid.*), from N. Australia; *Perigonia obliterans* (p. 28), from India, and *P. interrupta* (p. 29), from Mexico and the West Indies; *Cherocampa trilineata* (p. 30), from Venezuela; *C. inornata* and *C. comminutus* (p. 31), from Australia; *Panacra restituta* (p. 32), from Mexico; *Zonilia mixtura* (p. 34), from Aru; *Macrosila discistriga* (p. 35) and *M. luctifera*, from the Eastern Archipelago; *Anceryx increta* (p. 36), from Shanghai; *Basiana submarginalis* (p. 37), from Sierra Leone; *B. canescens* (p. 38), from Cambodia; and *B. semifervens* (*ibid.*), from Ternate; *Smerinthus complacens* (p. 40), from Amoy; and *Cypa* (g. n.) *ferruginea* (p. 42), from Ceylon.

CASTNIIDÆ.

Walker has described *Castnia papilionaris* (List Lepid. xxxi. p. 42), from Bogota, and *C. morphoides* (p. 43), from Brazil; *Gazera personata* (p. 43), from Guayaquil; and *Synemon catocaloides* (p. 44), from Swan River.

(Agaristidæ, Walk.)

Walker has described *Agarista contorta* (l. c. p. 45), *A. flexuosa* (p. 46),

and *A. diversa* (p. 49), from Australia; *A. alienata* (p. 46), from New Hebrides; *A. equalis* (p. 47), *A. privata*, and *A. micacea* (p. 48), from the Eastern Archipelago.

The same author describes *Eusemia communicans* (l. c. p. 50), from Cambodia; *vacillans* (p. 51), *mutata* (p. 52), *emolliens* (p. 53), and *fenestrata* (p. 54), from Celebes; *conferta* (p. 53), from Sumatra; and *saturata* and *josioides* (p. 54), from Gilolo. Also *Burgena* (g. n.) *educta* and *transducta* (p. 56), from Ké and Gilolo; *Bocana* (g. n.) *lunaris* (p. 57), from Celebes; *Baputa* (g. n.) *dimidiata* (p. 58), from New Guinea; *Hecatesia exultans* (p. 58), from Swan River; and *Callidula erycinata* (p. 60), from New Guinea.

ZYGÆNIDÆ.

PACKARD has published an elaborate paper on the *Zygænidae* (Proc. Essex Inst. vol. iv. pp. 7-47), in which, after detailing the history of the group, he discusses its characters and position.

He includes the *Castniæ* in the family, and regards it as allied through them with the *Sphingidæ*, and by the typical *Zygæninae* with the *Ægeriidæ*. In its transformations the group shows some affinities to the *Arctiidæ*. Of the subfamily *Castniaræ*, Packard characterizes the genera *Castnia*, l. c. p. 22, *Alypia*, l. c. p. 23, and *Eudryas*, l. c. p. 24; of the *Zygæninae* the known genera *Ctenucha* (with a complete history of *C. virginica*, Grote), l. c. pp. 33-40, *Scopsis*, l. c. p. 40, and *Lycomorpha*, l. c. p. 43, and two new genera.

Gartner (Stett. ent. Zeit. 1864, pp. 155-158) describes the life-history of *Atychia (Procris) appendiculata* (Esper), which is found in the neighbourhood of Brünn on high grounds clothed with a scanty herbage. The male flies about in the sun, especially towards sunset; the female is incapable of flight, and remains sitting on a stalk of grass with the head upwards. The larva lives in spring among the roots of *Festuca ovina*, upon which it feeds; it changes to a pupa in the latter part of April, and the perfect insect escapes from the middle of May to the middle of June. The larva is thick and helpless, resembling rather that of a Coleopterous insect; it is furnished with 16 feet, but, when disturbed, retracts the prolegs, and thus acquires a most peculiar aspect.

Ctenucha virginica is figured, with its larva and pupa, by Packard, l. c. pl. 1. figs. 1-4. Details of the following species are given by the same author: *Alypia octomaculata* (Hübner), l. c. pl. 2. fig. 1, *Eudryas grata* (Boisd.), l. c. figs. 2 & 3, and *Lycomorpha pholus* (Harr.), l. c. fig. 4.

E. Horton discusses the evidence in favour of the specific separation of *Ino (Procris) geryon* from *I. statice*; he regards the former as only a dwarf variety of the latter. Zoologist, 1864, pp. 8907-8912.

Horton publishes observations on the newly hatched larvæ of *Procris geryon* and *P. statice*. Ent. M. Mag. vol. i. p. 141.

E. Cooper describes a variety of *Zygæna filipendulæ*, having the parts ordinarily red of a dark brown colour. Ent. M. Mag. vol. i. p. 143.

Harrisina, g. n., Packard, l. c. p. 31. Allied to *Procris*; wings much longer and narrower, hind wings ovate. Type *Procris americana* (Harr.). *Harrisina sanborni*, sp. n., Pack. l. c. p. 32, from the Middle States.

Anatolmis, g. n., Packard, l. c. p. 45. Allied to *Lycomorpha*; fore wings

narrower, with a straighter costa; hind wings triangular. *A. grotei*, sp. n., Pack. l. c. p. 47, from the Colorado Territory.

Walker has described the following species as new: *Zygæna ngamica* (List Lep. xxxi. p. 61), from Lake Ngami; *Procris tetragona* (p. 62), from Batchian, and *P. subdolosæ* (ibid.), from Australia; *Syntornis bogotata* (p. 63), from Bogota; *bivittata* (p. 66) and *macrospila* (p. 67), from Sierra Leone; *velatipennis* (ibid.), from Abyssinia; *aperiens*, *incipiens* (p. 68), and *glaucoptoides* (p. 69), from Southern India; *strigosa* (ibid.) and *celebesæ* (p. 70), from Celebes; *siamica* (ibid.), from Siam; *tigrina* (p. 71), from Cambodia; *albosignata* (ibid.), from Pulo; *pactolina* and *aperta* (p. 72), from Australia; *fenestrata* (p. 73), from Mysol; *guttulosa* (ibid.), from Aru; *adjuncta* (p. 74), from Ceram and Amboina; *vacua* (p. 75) and *linearis* (p. 77), from Macassar and Celebes *diversa* (p. 75) and *contermina* (p. 78), from Singapore; *ampla* (p. 76), from Aru; *basigera* (p. 77), from Batchian; *libera* (ibid.) and *basalis* (p. 79), from Malacca; and *approximata* (ibid.), from Sumatra.

The same author describes *Burlacena* (g. n.) *ægerioides* (l. c. p. 80), from New Guinea, and *B. ? similata* (p. 81), from Mysol; *Pseudomyia decisa* (p. 81) and *P. quadristrigata* (p. 82), from Ega; *Pheia divisa* (p. 83), from Ega, and *P. vittata* (ibid.), from Vera Cruz; *Gymnelia mexicana* (p. 84), from Mexico, and *G. collocata* (ibid.), *consociata*, *aterrima* (p. 85), and *nigerrima* (p. 86), from Ega; *Isanthrene basifera* (p. 83), from Bogota; *I. æqualis* (p. 87), from Ega; *Pæcilosoma hilaris* (p. 88), from Ega; *Lagaria circumdata* (ibid.), from Bogota; *L. abdominalis* (p. 89), from Archidona; *Cosmosoma bivittata* and *megaspila* (p. 90), from Brazil and Ega; *Eurata intersecta* (p. 91) and *emergens* (p. 92), from Ega; *Eumonia smaragdina* (p. 92), from Ega; *Æthria saturatissima* (p. 93), from Ega; *Pseudospheer notabilis* (p. 94) and *arctata* (p. 95), from the Amazons; *Chrysocale magnifica* (p. 96) and *Empyreuma suprema* (ibid.), from Bogota; *Eupyra principalis* (p. 97), from Mexico; *Charidea cinctipennis* (ibid.), from Bogota; *Ilira aruica* (p. 98), from Aru; *calipennis* (p. 99), from Amboina; and *rubricollis* (ibid.), from Aneiteum; *Pampa oppositens* (p. 100), from Ega; *Aclytia buprestoides* (p. 101), from Pará; *trognoïdes* (ibid.), from Brazil; and *contracta* (p. 102), from Sierra Leone; *Automolus semirosea* (p. 103), from Ega; *A. crassa* and *A. ? albicollis* (p. 104), from Bogota; *Eucerea pyrrhopyga* (p. 105), from Brazil; *Pelochyta diffinis* (ibid.), from Pará; *P. sinulatrix* (p. 106), from Bogota; *Phauda sumatrensis* (ibid.), from Sumatra; *Byblisia* (g. n.) *latipes* (p. 107), from Sierra Leone; *Salinuca* (g. n.) *thoracica* (p. 108) and *aurifrons* (p. 109), from Sierra Leone; *Odozana* (g. n.) *hoccosa* (p. 110), from Ega; *Balitea* (g. n.) *ægerioides* (p. 111), from North China.

(*Chalcosiidæ*, Walk.)

Walker has described *Pompelon inornata* (l. c. p. 111), from Sumatra; *P. sobria* (p. 112), from Cambodia; *Cyclosia semiradiata* (p. 113), *dunaidæ* (p. 114), *castigata* (p. 115), from Sumatra, and *Cyclosia spargens* (ibid.), from Celebes; *Chalcosia pretiosa* (p. 116), from Ceylon; *Piderus inclusus* (p. 117), from Sumatra; *Elerusia repleta* (p. 118), from Cambodia; *transversa* (ibid.) from Borneo; *dirupta* (p. 119), and *euchromioides* (p. 120), from China; *triliturata* (p. 119), from Mussoorie; *osseata* (p. 120), from Sumatra; and *circumdata*, from Hindostan. Also *Soritia mutilata* (p. 121), from Mysol; *Doclea* (g. n.) *syntomoides* (p. 122), from Malacca; *Arycanda maculifera* (p. 123),

from Amboina and Ceram; *Didina invaria* (p. 123), from Sumatra; *Cormia* (g. n.) *obscurata* (p. 124), from Sumatra, and *spoliata* (p. 125), from Cambodia; *Birtina* (g. n.) *lycænoïdes* (ibid.), from New Guinea; *Trypanophora argyropila* (p. 126), from Hongkong; *Birtha* (g. n.) *gracilis* (p. 127), from Japan; *Gingla* (g. n.) *radialis* (p. 128), from Mexico; *Caprima* (g. n.) *gelida* (p. 129), from Mysol and New Guinea; *Balaca* (g. n.) *picaria* (p. 130), from Waigiou.

(*Melameridæ*, Walk.)

Walker describes *Josia ligata* (p. 131), *patula*, *auriflua* (p. 132), from Bogota; *penetrata* (p. 134), from Mexico; *alterata* (ibid.), from Ega; and *fusi-gera* (p. 133), of uncertain habitat; *Phalcidona vespertina* (p. 135), from Bogota, and *matutina* (ibid.), from the Amazons; *Phasis contraria* (p. 136), origin unknown; *Phavarea punctifera* (ibid.), from Bogota; *Scedrosa dentifascia*, *transcissa* (p. 137), *transfixa* (p. 138), from Bogota; *trajecta* (ibid.), from Ega; and *extensa* (p. 139), from Brazil; *Getta* (g. n.) *niveifascia* (p. 140), from the Amazons; *Gangamela* (g. n.) *saturata* (p. 140), from Brazil; *Gerra* (g. n.) *radialis* (p. 141), origin unknown; *Coreura* (g. n.) *euchromoides* (p. 142), from Bogota; *Bepara* (g. n.) *egaca* and *sublata* (p. 143), from Ega; *Dosa* (g. n.) *obesa* (p. 144), from Ega; *Birhana* (g. n.) *consocia* (p. 145), from Mysol.

(*Dioptidae*, Walk.)

Walker has described *Phelloë munda* (l. c. p. 146), from Parà; *P. decorata* (ibid.), from Ega; *Agyrta lucida* (p. 147), from Bogota; *A. gavis* (ibid.), from Ega; *Laurona subafflicta* (p. 148), from Bogota; *L. rufilinea* (ibid.), *herdina*, *onegia* (p. 149), and *celiana* (p. 150), from Ega; *Gonora* (g. n.) *heli-coniata* (p. 151), from Bogota; *Thersana* (g. n.) *acuta* (p. 152), from the Amazons; *Zigira* (g. n.) *quadrata* (p. 153), from Bogota.

(*Pericopidæ*, Walk.)

Walker describes *Hyalurga alboritrea* (l. c. p. 153), from Ega; *Pericopis rorata* (p. 154), *dissimulata*, and *dissimulans* (p. 155), from Bogota; *Phlæochlena privata* (p. 156), from Bogota; *Belciana* (g. n.) *strigularis* (p. 157), from Bogota; *Stenele maculifrons* (ibid.), from Limas; *Milionia cyaneifera* (p. 158), from Batchian; *Buzara* (g. n.) *chrysomela* (p. 159), from New Guinea; *Satara* (g. n.) *æquata* (p. 160), from Celebes; *Bordeta* (g. n.) *quadriplagiata* (p. 161), from Timor; *B. sexplagiata* (p. 162), from Batchian; *Bizarda* (g. n.) *optima* (p. 163), from Waigiou, and *B. clarissima* (ibid.), from Aru; *Celerena* (g. n.) *sobria* (p. 164), *extenuata*, *cincta* (p. 165), *scissa* (p. 166), *mutata*, *commutata* (p. 167), *proxima*, *connexa* (p. 168), *spretta* (p. 169), and *munda* (p. 170), all from New Guinea and the Eastern archipelago; *Carpella* (g. n.) *districta* (p. 170), from Venezuela; *Genussa* (g. n.) *celerenaria* (p. 171), from Parà.

(*Euschemidæ*, Walk.)

Walker (l. c. pp. 172-178) describes the following species of *Euschema* from the Malayan region: *Euschema flavata*, *contraria*, *spectabilis*, *tentans*, *patula*, *remota*, *binotata*, *luteopicta*, and *semitiplena*.

(*Chrysaugidæ*, Walk.)

Walker has described *Lyces eterusialis* (l. c. p. 178), from New Granada;

Chrysauge detracta (p. 179), from Venezuela: and *C. tripars* (ibid.), origin unknown; *Flavinia leta* (ibid.), from Mexico and Bogota; *Mennis nasuta* (p. 180), *districta* and *integra* (p. 181), from New Granada; *Scaptosyle bicolor* (p. 182), from Ceylon; *S. calida* (ibid.), from Ceram; *Sangala imparata* (p. 183), from Bogota; *Nelo altera* (ibid.) and *N. basalis* (p. 184), from Bogota; *N. coccineata* (ibid.), from Bolivia; *Darna* (g. n.) *colorata* (p. 185), from Bogota; *Devara? frigida* (ibid.), from Cuença; *Glissa* (g. n.) *bifacies* (p. 186), from Ega; *Stonia* (g. n.) *bipars* (p. 187), from Moreton Bay; *Bursada* (g. n.) *plagiata* (p. 188), *basistriga*, *hieroglyphica* (p. 189), *fidonioides*, *quadripartita* (p. 190), *truncata* (p. 191), *aurinata*, *splendida*, and *intercisa* (p. 192), all from the Malayan region; *Byrsia* (g. n.) *dotata* (p. 193), from Timor; *Bociraga* (g. n.) *recurvata* (p. 194), from Batchian; *Bytharia* (g. n.) *marginata* (p. 195), from Ceram; *Burtina* (g. n.) *continua* (p. 196), from Celebes; *Bandobena* (g. n.) *apicalis* (p. 197), from Celebes.

SESIIDÆ.

Lintner describes the metamorphoses of *Sesia thysbe* (Fab.), Proc. Ent. Soc. Phil. vol. iii. p. 646.

Kirkpatrick states that the food-plants of *Sesia diffinis* are the Snowberry (*Symphoricarpus racemosus*) and the Upright Honeysuckle (*Lonicera tutarica*). Proc. Ent. Soc. Phil. vol. iii. p. 43.

The larva of *Eudryas unio* burrows in stems of *Hibiscus militaris*; Kirkpatrick, Proc. Ent. Soc. Phil. vol. iii. p. 43.

Breyer describes and figures the transformations of *Thyris fenestrella* (Scop.), Ann. Soc. Ent. Belge, 1863, pp. 17-24, pl. 1. fig. 1.

New species :—

Sphecia sinensis, Walker (List Lepid. xxxi. p. 1), from Hong Kong.

Walker describes *Ægeria producta* (l. c. p. 4), from Mexico; *Æ. basalis*, *fasciculipes* (p. 5), *pulchripennis*, *ruficaudis* (p. 6), *crassicornis* (p. 7), *plumipes*, *apicalis* (p. 8), *æqualis* and *unicolor* (p. 9), from the Amazons district; *Æ. ochracea* (p. 10), from Natal; *Æ. alterna* (p. 10) and *cupreipennis* (p. 11), from Southern India; *Æ. gravis* and *bicincta* (p. 12), from North China; *Æ. auriplena* (p. 13), from New Guinea; and *Æ. clavicornis* (p. 14), from Batchian.

Samina cambodialis, Walk. (l. c. p. 15), from Cambodia.

Walker also describes *Melittia rutilipes* (l. c. p. 16), from Batchian, *chrysogaster* (ibid.); from Celebes, *strigipennis* (p. 17), from Gilolo, *siamica* (p. 18), from Siam, *mysolica* (ibid.), from Mysol, and *productalis* (p. 19), from Celebes; *Toleria* (g. n.) *abieformis* (l. c. p. 20), from N. China; *Erectica* (g. n.) *fasciata* (l. c. p. 21), from Ega; *Cotana* (g. n.) *mediana* (p. 21), from Para; *Tirista* (g. n.) *argentifrons* (p. 22), from Mexico; *Tinthia* (g. n.) *varipes*, from Celebes, and *variegata*, from Hong Kong (p. 24); *Tinægeria* (g. n.) *latipes* (p. 25), from Parâ; and *Arauzona* (g. n.) *basalis* (p. 26), from Ega.

HEPIALIDÆ.

Scott figures and describes *Charagia lignivora* (Lewin), Austral. Lepid. p. 5, pl. 2 (*Phloropsyche venusta*, Scott); *Cryptophasa albocosta* (Lewin), l. c. p. 8, pl. 3.

Scott describes the occurrence of parasitic fungi upon the larvæ of his *Pielus swainsoni*, and other caterpillars in New South Wales, in Austral. Lepid. p. 13.

Scott states that *Charagia virescens* (Doubl.) and *C. viridans* (Steph.) are ♂ and ♀ of the same species. Austral. Lepid. p. 14.

Grote states, on Walker's authority, that *Hepialus argenteo-maculatus*, var., of Brit. Mus. Cat. Lep., is *Gorgopis 4-guttatus* (Grote). Proc. Ent. Soc. Phil. vol. iii. p. 535.

The larva of *Zeuzera æsculi* is described by Newman, Entomologist, vol. ii. p. 92; and a variety of it by Hearder, Ent. M. Mag. vol. i. p. 96.

Sthenopis, g. n., Packard, Proc. Ent. Soc. Phil. vol. iii. p. 390. Allied to *Hepialus*; head smaller and more prominent; fore wings falcate, inner margin convex; hind wings produced at apex; abdomen elongated, with a slight anal tuft; hinder tibiæ in ♂ with a large oblong tuft. Known species: *Sthenopis argenteo-maculata* (Harris); *S. purpurascens* (Pack.); and *S. quadriguttata* (Grote).

New species:—

Sthenopis (g. n.) *argentata*, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 392, from Massachusetts.

Hepialus mustelinus, Packard, l. c. p. 393, from Maine; *H. labradoriensis*, Pack. l. c. p. 394, from Labrador; *H. pulcher*, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 522, pl. 5. fig. 3, from the Colorado Territory.

Gorgopis quadriguttatus, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 73, pl. 1. fig. 3, from the Great Slave Lake.

Charagia splendens, Scott, Austral. Lepid. p. 6, pl. 2 (*Phloiopsyche splendens*).

Cryptophasa immaculata, Scott, Austral. Lepid. p. 9, pl. 3; *C. bipunctata*, Scott, ibid., and *C. spilonota*, Scott, l. c. p. 10, pl. 3.

Pielus swainsoni, Scott, Austral. Lepid. p. 11, pl. 4 (*Rhizopsyche swainsoni*).

BOMBYCIDÆ.

Bar mentions the occurrence in Cayenne of an aquatic caterpillar, which produces a moth resembling *Bombyx phœdima* of Cramer. This larva lives at the bottom of the water, and feeds on the roots of an abundant weed. Bull. Soc. Ent. Fr. 1864, p. xxiv.

Couper records the discovery of larvæ of *Attacus polyphemus* near Quebec, feeding on the sweet briar, and describes its transformations. Canad. Nat. & Geol. new ser. vol. i. p. 376.

Kretzschmar describes an hermaphrodite *Saturnia pavonia*. Berl. ent. Zeits. 1864, p. 397.

Perris records the destruction of great numbers of the torpid larvæ of *Bombyx pityocampa* in the Landes by the intense cold of the winter of 1863-64. Ann. Soc. Ent. Fr. 4^e sér., tom. iv. p. 308.

Breyer publishes a figure of a variety of *Bombyx quercus*. Ann. Soc. Ent. Belge, tom. vii. pl. 7. fig. 2.

A variety of *Bombyx neustria* is figured by Fologne. Ann. Soc. Ent. Belge, tom. vii. pl. 3. fig. 3.

Grote regards Walsh's *Sphingicampa distigma* (see ante, p. 332) as specifically

identical with *Dryocampa bicolor*, and as belonging to the genus *Adelocephala* (Boisd.). Proc. Ent. Soc. Phil. vol. iii. p. 538.

Phalæna neustria (Abbot & Smith) = *Clisiocampa sylvatica* (Harr.) is identical with *Malacosoma disstria* (Hübner). It stands therefore as *Clisiocampa disstria*. Grote, l. c. p. 537.

Grote also has notes (l. c. pp. 538, 539) upon *Notodonta basistriens* (Walk.), *N. stragula* (Grote), and *Heterocampa subalbicans* (Grote), chiefly relating to their geographical distribution in the United States.

Notodonta basistriens (Walk.) is figured by Grote, Proc. Ent. Soc. Phil. vol. iii. pl. 1. fig. 1.

Reakirt states that his species *Limacodes viridus* and *L. lorquini* belong to the genus *Parasa* (Moore), and that the supposed male of the latter is really the female of a distinct species, for which he proposes the name of *Parasa zilona*. Proc. Ent. Soc. Phil. vol. iii. p. 441.

Brown's remarks on the genus *Acentropus* and its affinities (from Sir Oswald Mosley's 'Natural History of Tutbury') are reprinted in the Zoologist, 1864, pp. 8917-8920.

Cnethocampa (*Gastropacha*) *processionea*, L. An account of the mode of life of the caterpillar is given by Cornelius, Verh. natürl. Ver. preuss. Rheinl. und Westph. 1864, p. 64 (Correspond.).

G. Gascoyne describes the life-history of *Liparis auriflua*, Zoologist, 1864, p. 9332.

The larva of *Platypteryx unguicula* is described by Newman, Entomologist, vol. ii. p. 34.

Hoffmann has published a Dutch translation of a Japanese book on the Yama-Mai silkworm (*Bombyx yama-mai*, Guér.), and of this a German translation by Haupt has been published in the Corr.-Blatt zool.-min. Ver. Regensb. 1864, pp. 62-81. This paper gives an account of the different kinds of *Quercus* used for feeding the silkworms, of the various modes adopted in rearing the insects, of the selection and preservation of the eggs, the treatment of the cocoons, and the management of the perfect moths.

Guérin-Ménéville announced the return of M. Simon from North China, with eggs and cocoons of *Antheræa pernyi*, which he believes, from this circumstance, to be double-brooded. The acclimatization of this species, the larva of which feeds on the oak, is to be attempted in France. Bull. Soc. Ent. Fr. 1864, p. x.

Guérin-Ménéville records the progress of the experiments in acclimatizing the Japanese silkworm (*Antheræa yama-mai*) in France, and states that the larvæ having begun to hatch about the middle of March, before oak-leaves could be obtained for them, it was found that they would feed upon the leaves of *Cratægus glabra*. Sixteen cocoons of *Saturnia atlas*, and twenty of *Antheræa roylei*, from the Himalaya, the latter a fourth oak-eating silkworm, have been received by Guérin. Bull. Soc. Ent. Fr. 1864, p. xv.

Guérin-Ménéville has found that the larvæ of the Japanese Silkworm (*Antheræa yama-mai*) are developed in the eggs within a few days of their deposition (in autumn), although they are not hatched until the following spring. Bull. Soc. Ent. France, 1863, p. xlv.

Boisduval regards *Antheræa yama-mai* and *A. pernyi* as climatal varieties of *A. mylitta*. Bull. Soc. Ent. Fr. 1864, p. 16.

Van Westmaas (Tijdschrift voor Entom. vii. pp. 75-110) describes the first attempts at breeding *Antheræa yama-mai* (Guér.) in Holland, and gives a full description, illustrated with good figures (pl. 4-6) of the varieties of the perfect insect, of the larva in its different stages of growth, and of the pupa and cocoon.

Cornalia (Atti della Soc. Ital. vol. vi. p. 35) has given a notice of some of the attempts made at the cultivation of *Antheræa yama-mai* in the south of Europe, and of some tissues made with its silk.

Beavan gives an account of the breeding of the Tusseh Silkworm (*Antheræa paphia*) in Bengal, with a description of the larva in its several states, and a list of the plants on which the larva feeds. Proc. Ent. Soc. London, 1864, pp. 40-43.

Girard has published a note on the Dipterous parasites of the common Silkworm (*Sevicaria mori*) and the Silkworm of the *Ailantus* (*Antheræa cynthia*). Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 155-157.

Hutton (Trans. Ent. Soc. pp. 143-173) attributes the prevalence of muscardine and other diseases among Silkworms to the combined effects of bad and scanty food, deficiency of light and ventilation, too high a temperature and constant interbreeding. The same effects, he believes, have been produced in all parts of the world where silk is cultivated. He refers to the occasional occurrence of a few dark, brindled larvæ among the ordinary pale Silkworms, from which he inferred that the original colour of the caterpillar was dark, and that the paleness of the ordinary Silkworms is due to degeneracy. By selecting these dark larvæ and breeding from the moths produced from them, the successive broods were found to become darker and more vigorous, and produced larger cocoons; and in 1863 the eggs of the spring batch of moths began to hatch for a second brood in August, and continued hatching until the 23rd of September, when they were removed to a lower temperature to prevent the further exclusion of larvæ. They again began to hatch, however, at the beginning of December. The whole of these worms were of the dark kind, and the author attributes their increased vitality to their really constituting a reversion towards the original form of the species. Hence he recommends the cultivator of silk to separate his dark Silkworms from the rest of his stock, in the hope that, by breeding from them, he may in a few years replace the present unhealthy stock by a more vigorous brood.

Notes on sericulture, and on the introduction into France of new species of Silkworms, were communicated to the Academy of Sciences of Paris by Guérin-Ménéville (see Comptes Rendus, tome lviii. pp. 742 & 838, and tome lix. pp. 28 & 438), by Pinson (ibid. tome lviii. p. 969), by Favier (ibid. tome lix. p. 894), and by Mal. de Lapeyrouse (ibid. p. 1064).

Julian Hobson describes the economy of the Tusseh Silkworm (*Saturnia mylitta*). Zoologist, 1864, pp. 9257-9259.

The 'Technologist' contains a long paper "On Sericulture in Oudh," by Dr. Bonavin (vol. iv. pp. 343-365); an article on the "Silk-trade of Beyrout" (l. c. pp. 548-550); an article on "Silkworm Culture" (vol. v. pp. 128-131), containing much condensed information with regard to the production of silk in various parts of the world; a reprint of Captain Hutton's paper "On the

Reversion and Restoration of the Silkworm (*l. c.* pp. 175-189 & 216-227); and a paper by Lady Mary Thompson (*l. c.* pp. 232-235), giving an account of her experiments in rearing *Antheræa cynthia* in Yorkshire.

New genera and species :—

(*Bombycides*.)

Callosamia, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 379. Allied to *Samia*; front of head narrower and less hairy; antennæ broadly pectinated; trunk very short; fore wings more than twice length of body, falcate; hind wings much produced at anal angle. Sp. *C. promethea* (Drury); *C. angulifera* (Walk.).

Euchromia, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 382. Allied to *Saturnia*; antennæ with short joints, each with two pairs of pectinations, of which the second is small; palpi forming two small tubercles; thorax short and round; fore wings about length of body, costa straight. Sp. *E. maia* (Drury).

Eudelia, Philippi, Stett. ent. Zeit. 1864, p. 91. Allied to *Saturnia*; palpi projecting, very strongly hairy; wings triangular, acute, outer margin concave; hind wings tailed at hinder angle, tail curved outwards; fore tibiæ double, having an inferior branch springing from their base of equal length with the main tibiæ. Philippi is doubtful whether this is an accidental monstrosity, or a regular occurrence in the ♂ or in both sexes. Sp. *Eudelia rufescens*, Ph., sp. n., from Valparaiso.

Antheræa eucalypti, Scott, Australian Lepid. p. 1, pl. 1.

Gastropacha ferruginea, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 386, from Michigan.

Clisiocampa californica, Packard, *l. c.* p. 387, from California.

(*Nyctemeridæ*, Walk.).

The following species of *Nyctemera*, from the Malayan region, are described by Walker (List Lepid. xxxi. pp. 198-208): *Nyctemera simulatrix*, *celsa*, *subvelata*, *velans*, *guttulosa*, *punctifera*, *clara*, *instructa*, *crescens*, *separata*, *intercisa*, *mutabilis*, *simplex*, *quadriplaga*, and *contracta*.

The same author describes (*loc. cit.*): *Nyctemera maculosa* (p. 198), from Hindostan; *Nyctemera* ? *vagata* (p. 208), from N. Australia; *Girpa* (g. n.) *circumdاتا* (p. 209), from Congo; *Melanchroia subaspersa* (p. 210), from Moreton Bay; *M. sexplagiata* (*ibid.*), *junctura*, and *luteivena* (p. 211), from Bogota.

(*Limacodides*.)

Callochlora, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 339. Allied to *Euclea*; antennæ shorter; palpi shorter and thinner; costa of fore wings more excavated in the middle; thorax and a band on the wing grass-green; scales finer than in *Euclea*. Sp. *C. vernata*, Pack., sp. n., from New York.

Cyrtosia, Packard, *l. c.* p. 342. Allied to *Limacodes*; forehead narrow; palpi long, slender, slightly ascending; antennæ simple, slender; costa of fore wings very convex.

Cyrtosia elegans, Packard, *l. c.* p. 342, from Boston; *C. fusca*, Packard, *l. c.* p. 343, from New York; *C. geminata*, Pack. *ibid.*, from Philadelphia; *C. albipunctata*, Pack. *l. c.* p. 344, from New York.

Kronæa, Reakirt, Proc. Ent. Soc. Phil. vol. iii. p. 441. Allied to *Limacodes*; body slender; proboscis not visible; palpi porrect, slender, third joint elongate, acute; antennæ simple, rather long; legs very slender, naked, hind tibiæ with three spurs; fore wings subtriangular, costa nearly straight; hind wings obovate. Sp. *K.* (*Limacodes*) *minuta* (Reakirt).

Cyclopteryx, Packard, l. c. p. 344. Allied to *Euclea* and *Enupretia*; head and eyes large; antennæ thick, with short pectinations on basal half; fore wings subfalcate, very broad, subcostal nervure remote from costa; hind wings suborbicular. Known species *C. spinuloides* (Boisd.).

Cyclopteryx leucosigma, sp. n., Packard, l. c. p. 345, from New York.

Lithacodes, Packard, l. c. p. 345. Body slender; head large; antennæ long, simple, filiform; palpi very long, curved upwards, third joint long, acute; fore wings long and narrow. Sp. *L. fasciola* (Boisd.).

Isa, Packard, l. c. p. 347. Antennæ simple; palpi porrect, not passing front, third joint very small, acute; costa of fore wings convex in the middle. Sp. *I. texula* (Boisd.).

Tortricidia, Packard, l. c. p. 347. Antennæ simple, thick at base; palpi long, slender, ascending, second joint long and slender, third continuous, long, or short and conical; costa of fore wings convex; hind wings broadly triangular; legs long and slender. Known species: *T. pallida* (Boisd.); *T. flavula* (Boisd.). *T. testacea*, sp. n., Packard, l. c. p. 348, from Massachusetts.

Doratiophora lewini, Scott, Austr. Lepid. p. 17, pl. 6; *D. casta*, Scott, l. c. p. 18, pl. 6.

Apoda zylomeli, Scott, l. c. p. 19, pl. 6; and *A. infrequens*, Scott, l. c. p. 20, pl. 6.

Limacodes lorquini, Reakirt, Proc. Ent. Soc. Phil. vol. iii. p. 250, from the Philippine Islands; *L. viridus* (sic), Reakirt, l. c. p. 251, and *L. minuta*, Reakirt, ibid., from Philadelphia.

Limacodes biguttata, Packard, l. c. p. 341, from Pennsylvania and New York; *L. y-inversa*, Packard, ibid., from Pennsylvania.

Euclea monitor, Packard (= *Limac. cippus*, Harris), Proc. Ent. Soc. Philad. vol. iii. p. 337, from Cambridge and Boston; *E. bifida*, Pack. l. c. p. 338, from Brunswick; *E. ferruginea*, Pack. ibid., from Canada West.

Heterogenca shurtleffi, Packard, l. c. p. 346, from Brookline.

(*Psychides*.)

Phryganidia, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 348. Palpi ascending, curved, very narrow and slender; trunk as long as thorax; antennæ broadly pectinated in ♂, nearly simple in ♀; fore and hind wings triangular, apex of former subrectangular; second and third median nervules in both pairs arising from a common branch of the main nervure. Sp. *P. californica*, Pack., n. sp., p. 439.

Thyridopteryx nigricans, Packard, l. c. p. 350.

Æceticus coniferarum (Harris, MS.), Packard, l. c. p. 351, from Newbern.

(*Dasychirides*.)

Parorgyia, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 332. Allied to *Orgyia*; thorax with a median tuft of metallic scales; palpi shorter and more drooping

than in *Orgyia*; costa of fore wings straighter from base to middle, hind wings more rounded at apex; abdomen with a spreading apical tuft, and with tufts of metallic scales on second and third segments. Known species: *P. achatina* (Hübner); and *P. leucophæa* (Smith). *P. basiflava*, sp. n., Packard, l. c. p. 333, from Nonantum.

Orgyia definita, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 332, from Boston.

Lagoa crispata, Packard (= *L. opercularis*, Harris), l. c. p. 335, from Massachusetts.—*Lagoa cretata*, Grote, ibid. p. 524, from Louisiana.

(*Liparides*.)

Lacosoma, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 77. Fore wings large, broadly subfalcate, costa straight; hind wings ample, entire, anal angle prominent; antennæ ♂ rather short, bipectinate, with a basal tuft; anterior tarsi naked; posterior tibiæ with two small apical spurs; palpi rudimentary. Sp. *L. chiridota*, Grote, sp. n., p. 78, pl. 2. fig. 8.

(*Notodontides*.)

Apatelodes, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 353. Antennæ strongly pectinated; palpi slightly ascending, broad at tips, third joint minute; fore wings broad, triangular, costa straight, outer margin incised near the apex; hind wings irregularly pentagonal; femora densely pilose; hind tibiæ with four large spurs. Known species *A. torrefacta* (Smith). *A. hyalinopuncta*, sp. n., Packard, l. c. p. 354, from Massachusetts.

Lophodonta, Packard, l. c. p. 357. Allied to *Notodonta*; head large, forehead more prominent; palpi stout, porrect; prothorax slightly crested; fore wings triangular, costa straight, apex obtusely pointed. Known species *L. angulosa* (Smith). European species *L. dromedarius*. *L. ferruginea*, sp. n., Packard, l. c. p. 357, from Massachusetts.

Ædemasia, Packard, l. c. p. 359. Allied to *Schizura*; palpi short, porrect, third joint short; fore wings obtuse at apex; hind wings rounded, reaching little beyond basal half of abdomen. Known species *Æ. concinna* (Smith).

Ædemasia nitida, sp. n., Packard, l. c. p. 360, from Maryland; *Æ. badia*, Pack. l. c. p. 361, from Massachusetts.

Dasylophia, Packard, l. c. p. 362. Vertex with two erect tufts, meeting at the tips; palpi long, slender, acute, slightly ascending; costa of fore wings slightly concave for two-thirds of its length. Known species *D. anguina* (Smith). *D. interna*, sp. n., Packard, l. c. p. 363, from New Hampshire.

Cælodasys, Packard, l. c. p. 363. Vertex with a flattened hollow tuft projecting between the antennæ; antennæ in ♂ two-thirds or three-fourths pectinated, in ♀ simple; palpi short, very obtuse, porrect; a large conical tuft of hairs in front of first pair of legs; fore wings narrow, costa nearly straight; abdomen slender. Known species *C. unicorni* (Smith). Packard describes four new species of this genus: *Cælodasys edmondsii*, l. c. p. 364; *C. biguttatus*, l. c. p. 365; *C. harrisii*, ibid.; and *C. cinereo-frons*, l. c. p. 366; all from Massachusetts.

Xylinoles, Packard, l. c. p. 367. Allied to *Heterocampa*; antennæ broadly pectinated for two-thirds of length (♂); palpi short, stout, porrect; pronotum distinctly scaled; sternum pilose; fore wings narrow, tufted near inner

margin, costa straight; hind wings angular. Sp. *X. virgata*, n. sp., from Massachusetts and Michigan.

Platycerura, Packard, l. c. p. 373. Allied to *Cerura*; head very large, forehead broad; antennæ longer than in *Cerura*, narrowly pectinated, middle joints longest; fore wings short, broad, and triangular, costa straight; hind wings short and rounded; abdomen rapidly decreasing to apex. Sp. *P. furcilla*, n. sp., p. 374, from Massachusetts.

Notodonta stragula, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 92, pl. 1. fig. 2, from Williamsburg.

Raphia frater, Grote, l. c. p. 435, pl. 9. fig. 7, from the Middle States.

Parathyris angelica, Grote, l. c. p. 322, pl. 4. fig. 1, from the Middle States.

Heterocampa leptinoides, Grote, l. c. p. 323, pl. 4. fig. 2, from the Middle States.

Aglaosoma lauta, Scott, Austr. Lepid. p. 15, pl. 5.

Cerura australis, Scott, Austr. Lepid. p. 16, pl. 5.

Stauropus? *indeterminatus*, Walk. Proc. Linn. Soc. vii. p. 197, from Sarawak.

Felia (g. n.) *intermixta*, Walk. ibid., from Sarawak.

Ichthyura inversa, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 352, from Maryland; *I. indentata*, Pack. ibid., from New Hampshire.

Gluphisia trilineata, Packard, l. c. p. 355, from the Northern and Middle States.

Nadata doubledayi, Packard, l. c. p. 356, from New York.

Pheosia rimosa, Packard, l. c. p. 358, from Newport.

Cecrita? *bilineata*, Packard, l. c. p. 359, *C.?* *mustelina*, Pack. ibid., from Massachusetts.

Heterocampa obliqua, Packard, l. c. p. 363, from New York; *H. trouvelotii*, Pack. l. c. p. 369, from Massachusetts.

Lochmaeus. Of this genus Packard describes five new North American species: namely, *Lochmaeus tessella*, l. c. p. 370, from the Middle States; *L. olivata*, l. c. p. 371, and *L. cinereus*, l. c. p. 372, from Maine; *L. unicolor*, l. c. p. 373, and *L. marina*, ibid., from Seekonk.

(*Platypterycides*.)

Edapteryx, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 375. Nearly allied to *Platypteryx*, but with the apical margin of the fore wings tridentate, the middle tooth the largest; head and palpi small; antennæ well pectinated in both sexes. Sp. *E. bilineata*, n. sp., p. 376, from Massachusetts; *E. bilineata* (Packard, MS.), Grote, Proc. Ent. Soc. Phil. vol. iii. p. 529, pl. 6. fig. 9, from Pennsylvania.

Dryopteris irrorata, Packard, l. c. p. 377, from Maine.

ARCTIIDÆ.

Girard records a singular case of parasitism in *Chelonia carya*, in which a pupa of this insect produced a living moth with aborted wings, as well as the larvæ of a hymenopterous parasite. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 158.

Grote remarks upon the identity of *Halesidota tessellaris* (Abbot and Smith)

and *H. antiphola* (Walsh), the distinction of which reposes, as he states, merely upon a difference in coloration of the hairs of the larvæ and in its food-plant. He regards the two supposed species as positively identical, and indicates certain defects in Walsh's reasoning as applied to this form; he seems, however, to overrate the importance of his objections as regards the general question raised by Walsh. (See *ante* p. 332). Proc. Ent. Soc. Phil. vol. iii. p. 536.

The same author remarks upon a confusion that has taken place with regard to certain American species of the genus *Arctia*; *A. americana* (Harr.) has been confounded by Walker and Möschler with the European *A. carya*, and the name applied by the former to *A. parthenos* (Harr.). The latter is identical with *A. borealis* (Möschler), according to Grote. Grote also regards *A. speciosa* (Möschl.) as nearly allied to, if not identical with, *A. virguncula* (Kirby). Proc. Ent. Soc. Phil. vol. iii. p. 537.

Packard has some remarks on species allied to *Epicalia virginalis* (Boisd.). Proc. Ent. Soc. Phil. vol. iii. pp. 103, 109.

Grote describes the characters of *Arctia saundersii* (Grote) and *A. virgo* (Linn.), Proc. Ent. Soc. Phil. vol. iii. pp. 323 and 325, and figures the males of both species on pl. 4. figs. 3 and 4.

Fraser records the occurrence of larvæ of *Deiopeia pulchella* feeding upon the seeds of *Physostigma venenosum*, the Ordeal Bean of W. Africa. The larvæ consumed the kernel of the seeds; and Fraser ascertained that the poisonous principle was consumed by them as well as the starch-grains, by poisoning rabbits with the excrements of the larvæ. The active principle of the Bean (eserinia) was introduced beneath the skin of the larvæ, both in the solid form and in solution, and produced no injurious effect; the application of hydrocyanic acid quickly destroyed the caterpillars. Ann. & Mag. Nat. Hist. 3rd ser. vol. xiii. pp. 389-393.

Grote (Proc. Ent. Soc. Phil. vol. iii.) figures *Arctia persephone* ♂ (Grote), l. c. pl. 1. fig. 3; and *A. decorata* ♀ (Saunders), pl. 1. fig. 4. He also states that *A. nais* (Saund.) is identical with *A. virguncula* (Kirby), l. c. p. 77.

New genera :—

Platartia, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 109. Allied to *Epicalia*; palpi long, pointed, porrect; fore wings broadly triangular, costa convex, apical margin nearly straight; abdomen rather slender. Known species *P. parthenos* (Harr.) and *P. borealis* (Möschl.)

Callartia, Packard, l. c. p. 114 = *Chelonia* (Godart). Packard proposes to restrict this genus to the two European species *C. fasciata* and *C. pudica* and a new species from California. Antennæ in ♂ subsimple, in ♀ filiform; palpi long, slender, porrect; prothorax and patagia very distinct; costa nearly straight. *C. ornata*, Packard, l. c. p. 115, from California.

Seirartia, Packard, l. c. p. 119. Allied to *Halesidota*; palpi porrect, large, and long; thorax finely scaled; fore wings long and narrow, costa bent in the middle, apex obtusely pointed, neuration resembling that of *Halesidota*; hind wings much produced towards apex. Sp. *S. echo* (Smith).

Pyrrharcia, Packard, l. c. p. 120. Palpi not reaching beyond forehead, their scales spreading; fore wings narrow, much produced towards apex,

costa convex in outer third; hind wings subtriangular, produced towards apex. Sp. *P. isabella* (Smith).

Leucarctia, Packard, l. c. p. 124. Allied to *Hyphantria*; antennæ pectinated in both sexes; palpi depressed, hardly passing the forehead, 2-jointed, joints nearly equal, scales on basal joint long; body stout; fore wings with apex much produced. Sp. *L. acraea* (*acria*, Smith).

New species :—

Arctia persephone, Grote, Proc. Ent. Soc. Phil. vol. ii. p. 433, from Pennsylvania; *A. saundersii*, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 75, from Canada West, = *A. virguncula* (Saunders, nec Kirby); *A. pallida*, Packard, l. c. p. 118, from New York.

Antarctia punctata, Packard, l. c. p. 123, from California.

Platartia (g. n.) *scudderii*, Packard, l. c. p. 113, from the Saskatchewan; and *P. modesta*, Pack. ibid., from California.

Scirartia (g. n.) *clio*, Packard, l. c. p. 120, from California.

Pyrrharcia (g. n.) *californica*, Packard, l. c. p. 121.

Leucarctia (g. n.) *californica*, Packard, l. c. p. 125.

Spilosoma vestalis, Packard, l. c. p. 125, from California.

Arachnis picta, Packard, l. c. p. 126, from California.

Arctia blakei, Grote, l. c. p. 523, pl. 5. fig. 2, from the Colorado Territory.

Nemeophila cervini, Fallou, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 23, pl. 1. fig. 2 (imago and larva), from the Valais, altitude 3000 metres.

Alypia ridingsii, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 521, pl. 5. fig. 1, from the Colorado Territory.

Callimorpha vestalis, Packard, l. c. p. 108, from the Middle States.

Halesidota agassizii, Packard, l. c. p. 123; *H. edwardsii*, Pack. l. c. p. 129; and *H. argentata*, Pack. ibid.: all from California.

(*Arctiidae*, Walk.)

Walker has described *Arctia complicata* (List Lep. xxxi. p. 279), from Vancouver's Island; *A. melanopsis* (p. 280), from Ceylon; *A. eoyena* (ibid.), from Batchian, &c.; *Daritis trapeziata* (p. 281), origin unknown; *Tinolius quadrimaculatus* (ibid.), from Cambodia; *Ammalo nautana* (p. 282), from the Amazons; *Glanycus nigrorufus* (p. 283), from Bogota; *Cretonotos communis* (p. 283), from Bouru, and *C. caudipennis* (p. 284), from Aru; *Idalus rufoviridis* (p. 285) from Bogota; *Hypercompa impleta* (p. 286), from India; *Areas conflictalis* (p. 286), *sparsalis*, and *rudis* (p. 287), from the Malayan region; *Thalaina punctilinea* (p. 288) and *angulosa* (p. 289), from Tasmania and South Australia; *Numenes interiorata* (p. 290), from Pará; *N. partita* (ibid.), from Darjeeling; *Spilosoma candida* (p. 291), from North America; *S. mexicana* (ibid.), *S. eugraphica* (p. 292), *subflavesceus*, and *marmorata* (p. 293), from South Africa; *S. rhodophila* (p. 294) and *fusifrons* (p. 295), from India; *S. sangaica* (p. 294), from Shanghai; *S. conferta* (p. 295), from Tasmania; *Cycnia sparsigutta* (p. 296) and *rubida* (p. 297), from Ceylon; *Alphæa varia* (ibid.), from Mussoorie; *Anthena scita* (p. 298), from Natal; *A. spurcata* (ibid.), from Sierra Leone; *Epantheria cyaneator* (p. 299), from Bogota; *E. qbdominalis* (p. 300), from Rio Janeiro; *Aloa costalis* (p. 301), from North

Australia; *A. colorata* (ibid.), origin unknown; *A. scita* (p. 302), from Sierra Leone; *A. rhodophæa* (ibid.), from Lake Ngami; *A. albistriga* (p. 303), from India; *Biturix venosata* (p. 304), from Mexico; *Amerila rubripes* (ibid.), from North Australia; *A. rhodopa* (p. 305), from India; *Carales imprimata* (ibid.) and *tenebrosa* (p. 306), from Rio Janeiro; *C. minuscula* (ibid.) from Bogota; *Halesidota megapyrrha* (p. 308) and *macularia* (p. 314), from North America; *H. mundata* (p. 309), from Sierra Leone; *H. sanguineata* (ibid.), *rufator*, *chrysogaster* (p. 312), from Bogota; *H. ochraceator* (p. 310) and *breviuscula* (p. 311), from Mexico; *H. californica* (p. 311), *H. albidator* (p. 313), from Ega; *H. secta* (ibid.), from Limas; *H. translucida* (p. 310) and *citrina* (p. 314), of unknown origin. Also *Pinara obtusa* (p. 315), from Sydney; *Metarctia erubescens* (ibid.), from Sierra Leone; *Anace incensa* (p. 316), origin unknown; *Thyrgorina* (g. n.) *spilosomata* (p. 318), from India; *Borseba* (g. n.) *surgens* (ibid.), from Bogota; *Binna* (g. n.) *penicillata* (p. 319), from Sierra Leone; *Savara* (g. n.) *simplex* (p. 320), from India; *Æthalida* (n. g.) *distinguenda* (p. 321), from Celebes.

(*Callimorphidæ*, Walk.)

Walker has described *Bizone emergens* (l. c. p. 261), from Hong Kong, *Deiopeia leonina* (p. 262), from Sierra Leone; *D. spilosomoides* (p. 263), from India; *D. pardalina* (ibid.), from Cambodia; *D. picta* (ibid.), from Moulmein and South China; *Ruscina latifera* (p. 264), from Mexico; *Tennessee congrua* and *discrepans* (p. 265), from Australia; *Eanasa* (g. n.) *nigrosca* (p. 266), from San Domingo; *Terna* (g. n.) *dotata* (p. 267), from Ega; *T. ampla* (ibid.), from Mexico; *Chiaca* (g. n.) *rubricosta* (p. 268), from Tasmania; *Chisobara* (g. n.) *catocalina* (p. 269), from Australia; *Gerla* (g. n.) *quadri-fasciata* (p. 270), from Mexico; *Castabala* (g. n.) *roseata* (p. 271), from India; *Godasa maculatrix* (p. 272), from Sierra Leone; *Curoba fasciata* (ibid.), origin unknown.

(*Hypsidae*, Walk.)

Walker describes (l. c. pp. 212-17) the following species of *Hypsa*, from the Malayan region: *Hypsa subimilis*, *albivena*, *camylana*, *aqualis*, and *significans*. Also *H. discreta* (p. 216), from North Australia; *stipata* (ibid.), *saturata* (p. 217), of uncertain origin; and *correcta* (ibid.), from Ceylon.

The same author describes *Euga* (g. n.) *ringuis* (l. c. p. 219), from Ambina, &c.; *Vitessa pyraliformis* (p. 220), from New Guinea; *V. pyraliata* (ibid.), from Celebes and Ceram; and *Eieta* (g. n.) *scxfasciata* (p. 221), from Ceram.

(*Ræseliidae*, Walk.)

Thymara papilionaria, Walk. (l. c. p. 277), from East Africa.

LITHOSIIDÆ.

Packard describes the variations of *Crocota ferruginosa* (Walk.), Proc. Ent. Soc. Phil. vol. iii. p. 104. *Crocota lvericornis* (Walk.) is probably identical with *C. lata* (Boisd.), Packard, l. c. p. 105.

Fclogne describes and figures a variety of *Lithosia rosea*, Ann. Soc. Ent. Belge, tome vii. p. 126, pl. 3. fig. 5.

Lithosia bicolor (Grote) is identical with *L. argillacea* (Packard), according to Grote, Proc. Ent. Soc. Phil. vol. iii. p. 535.

W. Buckler describes the larvæ of six species of the genus *Lithosia*, in Ent. M. Mag. vol. i. pp. 48 & 49. The species are *L. pygmæola*, *caniola*, *complanula*, *complanata*, *stramineola*, and *rubricollis*.

Newman (Entomologist, vol. ii. p. 123) describes the larva of *Lithosia caniola*.

New genera and species :—

Cræmbidia, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 99. Allied to *Lithosia*; apical margin of fore wings straight, costa convex, nervures equidistant, fifth nervure nearly in middle of wing. Sp. *C. pallida*, Pack., from Maine and Massachusetts.

Clemensia, Packard, l. c. p. 100. Nearly allied to *Mittochrista*, but head broader, antennæ shorter, and palpi larger and longer; apex of fore wings acute, fourth median nervure arising near middle of wing. Sp. *C. albata*, Pack. p. 101, from Maine.

Euphanessa, Packard, l. c. p. 102. Allied to *Nudaria*; forehead smooth, finely scaled, narrow; antennæ not tufted at base; palpi long; fore wings very broadly triangular, apical margin longer than the inner one. Sp. *E. mendica* (Walk.) = *Eudule biseriata* (H.-Sch.).

Lithosia argillacea, Packard, Proc. Ent. Soc. Phil. vol. iii. p. 98, from Maine and Massachusetts.

Crocota choriona, Reakirt, Proc. Ent. Soc. Phil. vol. ii. p. 371, *C. nigricans*, Reak. ibid., and *C. immaculata*, Reak. l. c. p. 372, from Philadelphia. Reakirt also indicates some specimens apparently of a variety of the last species, but which may prove to be distinct; in the latter case he proposes for them the name of *C. trimaculosa*.

(*Lithosiidæ*, Walk.)

Walker describes *Ardonca secreta* (List Lep. xxxi. p. 222), from Mexico; *Atolmis japonica* (p. 223), from Japan; *Lithosia viridata* (p. 225), from Darjeeling; *L. dorsoglaucia* (ibid.), *heterocera* (p. 226), and *vicaria* (ibid.), from South Africa; *L. precipua* (p. 229), from China; *L. intermixta* (p. 229), *alborosea*, *cramboides* (p. 230), and *L. inducta* (p. 232), from India; *L. transversa* (p. 229), from Australia; *L. nitens* (p. 231), from Moreton Bay; *L. impervia* (p. 230), from Ceram; *L. albidula* (p. 231), from Sierra Leone; *L. asperatella* (ibid.) and *acclinatella* (p. 232), from South Africa; *Cossa* (g. n.) *basigera* (p. 233), from India; *Ethopia* (g. n.) *roseilinea* (p. 234), from New Guinea; *Coutha* (g. n.) *semiclusula* (p. 234), from Ceram; *Setina atroradiata*, *quadripunctata* (p. 236), *quadrinotata* and *bilinea* (p. 237), from South Africa; *S. trifurcata* (ibid.), from Tasmania; *Digama nebulosa* (p. 238), from India; *Eutane gratiosa* (p. 239), from Australia; *Nepita signata* (p. 240), from Ceylon; *Cisthene lunaris* and *curvifera* (p. 241), from Bogota; *C. variegata* (p. 242), from Ega; *Pisara bifascialis* (p. 244), *lucidalis*, *ineffectalis*, *internella* (p. 245), from Borneo; *Barsine natalensis* (p. 251), from Natal; *B. suffundens*, *tripartita* (p. 250), and *nubifascia* (p. 251), from India; *B. placens* (p. 251), *circumdata* (p. 252), *rutila*, *lineata* (p. 253), *scripta*, and *virida* (p. 254), from the Malayan region; *B. rhodophila* (p. 254), from Shanghai; *Sesapa excurrens* and *decurrens* (p. 255), from India; *Sarbena* (g. n.) *conflagrans* (p. 256), from 1864. [VOL. I.] 2 L

New Guinea; *Clina* (g. n.) *lapidaria* (p. 257), from India; *Themiscyra* (g. n.) *latifera* (p. 258), from Moreton Bay; *Dotha* (g. n.) *ctenuchoïdes* (p. 259), from Sumatra.

Mirobriga (g. n.) *pulchripicta*, Walk. Proc. Linn. Soc. vol. vii. p. 196, from Sarawak.

(*Nudariidæ*, Walk.)

Walker has described *Nudaria obliterata* (List Lep. xxxi. p. 273), from Sierra Leone; *N. albida* (ibid.), from Moreton Bay; and *N. marginata*, *floc-cosa*, *subcervina* (p. 274), *margaritacea*, and *margaritaria* (p. 275), from India; and *Comacla* (g. n.) *murina* (p. 276), from East Florida.

NOCTUIDÆ.

Grote proposes the name *Pseudothyatira* for his genus *Lacinia*, the latter name being preoccupied in Mollusca. Proc. Ent. Soc. Phil. vol. iii. p. 539.

According to Grote (Proc. Ent. Soc. Phil. vol. iii. p. 540), *Achatodes sandix* (Guen.) is identical with *Gortyna zeæ* (Harris).

Grote has notes, chiefly relating to geographical range, upon several other North American species of this family: namely, *Leucania unipuncta* (Haworth); *Catocala clintonii* (Grote); *C. paleogama* (Guen.); *Anomis xyliua* (Say) = *bipunctina* (Guen.); *Philomma henrietta* (Grote); *Plusia arcoides* (Grote); *Exiotus moneti* (Grote); *Buptria albovittata* (Guen.); *B. infulata* (Grote) and *B. elaborata* (Grote). The last two are referred to Doubleday's genus *Erateina*. Proc. Ent. Soc. Phil. vol. iii. pp. 540-542.

The same author has some remarks on the American species of the genus *Gortyna*, Proc. Ent. Soc. Phil. vol. ii. p. 432. He records six species, exclusive of *G. zeæ* (Harris), which belongs to *Achatodes* (Guen.).

Grote states that he believes his *Philochrysa regnatrix* to be identical with *Euthysanotia timais* (Cram.), a South American and West-Indian species.

Kretschmar describes the larvæ of *Nonagria sparganii*, *N. nexa*, *Tapinostola fluxa*, *T. elymi*, *Cucullia pustulata*, and *Hydræcia lucens*, and remarks on the specific distinctness of the latter. Berl. ent. Zeits. 1864, pp. 398-401.

Grote (Proc. Ent. Soc. Phil. vol. iii.) has figured and described the following known species of this group: *Microcelia diphtheroides* (Guen.), l. c. p. 78, pl. 2. fig. 2; *M. fragilis* (Guen.), l. c. p. 80; and *Catocala paleogama* (Guen.), l. c. p. 87, pl. 3. fig. 2.

The 'Zoologist' contains a discussion as to the specific distinctness of *Dianthæcia capsophila*, pp. 8913-8915.

Bellier de la Chavignerie describes a peculiar variety of *Agrotis exclamationis* (♀). Bull. Soc. Ent. Fr. 1863, p. lii.

Dietrich states (Mittheil. Schw. ent. Ges. 1834, p. 258) that *Heliothis armigera* has been reared from larvæ feeding on maize. Its ordinary food-plant, according to Freier, is *Reseda lutea*.

Toxocampa cracca. The habits of this species are described by Horton. Ent. M. Mag. vol. i. p. 96.

J. Greene describes the larva of *Tethæa subtusa*. Ent. M. Mag. vol. i. p. 70.

W. Buckler describes the larvæ of *Xylophasia scolopacina* (Ent. M. Mag. vol. i. p. 50) and *Leucania comma* (l. c. p. 140).

The larvæ of the following species are described by Newman (Entomologist, vol. ii.): *Bryophila glandifera* (p. 35), *Acronycta æceris* (p. 43), *Triphæna orbona* (p. 44), *Noctua rhomboides*, *N. xanthographa* (p. 45), *Anchoscelis pistacina* (p. 46), *Scopelosoma satellitia* (p. 47), *Cosmia trapezina* (p. 49), *Polia chi* (p. 50), *P. flavocincta* (p. 51), *Amphipyra pyramidea* (p. 52), *Mania maura* (p. 53), and *Phragmataecia arundinis* (p. 90).

New genera :—

Dichagramma, Grote, Proc. Ent. Soc. Phil. vol. ii. p. 439. Allied to *Mythimna*; palpi not exceeding the head, densely hairy, third joint short; abdomen flat and short; hind tibiæ with four short spurs, inner pair longest. Sp. *D. walkerii*, Grote, and *D. vinulenta*, Grote.

Philomma, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 2. Allied to *Anthracia*; subcostal cell broader, proboscis shorter, and wings comparatively broader. Sp. *P. henricotta*, Grote, p. 3, pl. 2. fig. 1, from Massachusetts.

Litomitus, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 84. Allied to *Celiptera*; first segment of abdomen not crested; legs not clothed with "cottony" hairs. Sp. *L. elongatus*, Grote, p. 85, pl. 2. fig. 6, from the Eastern and Middle States.

New species :—

Bryophila guenei, Fallou, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 27, pl. 1. fig. 3, from Pau.

Acronycta noctivaga, Grote, Proc. Ent. Soc. Phil. vol. ii. p. 437, pl. 9. fig. 3, from Pennsylvania and New York; *A. afflicta*, Grote, l. c. p. 438, pl. 9. fig. 4, from Texas.

Noctua brunneicollis, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 524, pl. 5. fig. 5, *N. cupida*, Grote, l. c. p. 525, pl. 5. fig. 7, and *N. alternata*, Grote, l. c. p. 526, pl. 5. fig. 8, from the Middle States; *N. vittifrons*, Grote, l. c. p. 527, pl. 5. fig. 6, from the Colorado Territory.

Anthæcia mortua, Grote, l. c. p. 528, pl. 6. fig. 1; *A. packardii*, Grote, ibid., pl. 6. fig. 2; *A. nobilis*, Grote, l. c. p. 529, pl. 6. fig. 3; and *A. brevis*, Grote, l. c. p. 530, pl. 6. fig. 4: from the Colorado Territory.

Syneda howlandii, Grote, l. c. p. 533, pl. 6. fig. 7, from the Colorado territory.

Gortyna cataphracta, Grote, l. c. p. 81, pl. 2. fig. 3, from the Eastern and Middle States; *G. cerussata*, Grote, l. c. vol. ii. p. 431, from Pennsylvania.

Microcalia vinnula, Grote, l. c. p. 436, pl. 9. fig. 2, from New Jersey.

Microcalia obliterata, Grote, l. c. p. 79=*M. diphtheroides*, var. β (Walk.)

Dichagramma (g. n.) *walkerii*, Grote, l. c. vol. ii. p. 439, pl. 9. fig. 5, from Canada and the Middle States; and *D. vinulenta*, Grote, l. c. p. 440, pl. 9. fig. 6, from Texas.

Catocala. Edwards describes 11 new North American species of this genus (Proc. Ent. Soc. Phil. vol. ii.): namely, *Catocala briseis*, l. c. p. 508, from the Catskills and Rhode Island; *C. marmorata*, ibid., from California; *C. californica*, l. c. p. 509, *C. walshii*, ibid., from South Illinois; *C. nebulosa*, l. c. p. 510, from Philadelphia and Washington; *C. serena*, ibid., from Philadelphia; *C. tristis*, l. c. p. 511, from Philadelphia and New Jersey; *C. gracilis*, ibid., *C. similis*, ibid., *C. minuta*, and *C. parvula*, l. c. p. 512, from New York.

Catocala phalanga, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 86, pl. 3. fig. 1 = *C. palæogama*, var. A (Guen.), from the Middle United States; *C. patriæ*, Grote, l. c. p. 88, pl. 3. fig. 5, and p. 532, from the Middle and Eastern States; *C. clintonii*, Grote, l. c. p. 89, pl. 3. fig. 4, from the Eastern States; *C. subnata*, Grote, l. c. p. 326, pl. 4. fig. 5, from Maryland.

Apamea legilima, Grote, l. c. p. 82, pl. 2. fig. 4, from the Eastern and Middle States.

Eurois purpurissata, Grote, l. c. p. 82, pl. 1. fig. 5, from Pennsylvania.

Plusia æreoides, Grote, l. c. p. 83, pl. 2. fig. 5, from the Middle and Eastern States.

Amphipyra inornata, Grote, l. c. p. 86, from Canada West.

Luperina gueneei, H. Doubl. Ent. Ann. 1864, p. 123; Zoologist, 1864, p. 8916.

Dianthæcia barrettii, H. Doubl. Ent. Ann. 1864, p. 124, fig. 3; Zoologist, 1864, p. 8915.

Nonagra brevilinea, Fenn, Ent. M. Mag. vol. i. p. 107. Norfolk. Figured in Ent. Ann. 1865, fig. 3.

Walker (Proc. Linn. Soc. vol. vii. pp. 160-198) describes the following new species, belonging to this group, from Sarawak:—(HOMOPTERIDÆ) *Artigisa* (g. n.) *nigro-signata* (p. 160); *Veia* (g. n.) *homopteroides* (p. 161); *Gadirtha chalybea* (p. 161), *diffundens* (ibid.), *polygrapha*, *ferromixta*, *quadrivittata* (p. 162), *metaphæa*, *G.?* *semiferrens*, and *G.?* *discigera* (p. 163); *Phronana* (g. n.) *canescens* (p. 164); *Chuduca* (g. n.) *pyraloides* (p. 165); *Ciasa* (g. n.) *pustulifera* (ibid.); *Corsa absorbens* (p. 166); *Curgia* (g. n.) *nonagrica* (ibid.); *Cropia onerata* (ibid.); *Asinduma* (g. n.) *exscripta* (p. 167); *Carissa* (g. n.) *cossoides* (p. 168); *Maxilua* (g. n.) *frontalis* (p. 169); *Thacona* (g. n.) *costivitta* (p. 169); *Badausa* (g. n.) *hyphenoides* (p. 170); *Asta* (g. n.) *quadrilinea* (p. 171): (CATEPHIDÆ) *Anophia limitaris*, *angulifera* (p. 171), *suffundens* (p. 172); *Idicara* (g. n.) *olivacea* (ibid.); *Remusia hirtissima* (p. 173); *Steiria ferriifera*, *repleta* (p. 173), *humeralis*, *albistriga*, and *æquilinea* (p. 174); *Spersara* (g. n.) *glaucoptoides* (p. 175); *Minica semialba* (p. 175), *nigrilinea* (p. 176); *Maceda discalis* (ibid.); *Phyllodes semilinea* (ibid.); *Potamophora ferrifucta* (p. 177): (OMMATOPHORIDÆ) *Hypopyra apicalis* (p. 178): (BENDIDÆ) *Culicula* (g. n.) *bimarginata* (p. 178): (OPHIUSIDÆ) *Lagoptera palle-cens* (p. 179); *Cerbia subolivacea* (ibid.); *Ophisma rubida* (ibid.), *velata* and *lutea* (p. 180); *Achæa atrivitta*, *semipallida*, *purpureilinea* (p. 181), *pulchrevena* (p. 182); *Crithote* (g. n.) *horridipes* (p. 183): (REMIGIDÆ) *Remigia intracta*, *zeta* (p. 183), *R.?* *bendioides* (p. 184): (AMPHIGONIDÆ) *Amphigonina costistriga* (p. 184): (THERMESIDÆ) *Thermesia anteccedens* (p. 184), *metagona*, *discontenta*, *noctinix* (p. 185), *poaphiloides*, *T.?* *crassiuscula*, *ruficeps* (p. 186), *nigripalpis*, *plagifera*, *sparsa* (p. 187); *Capnodes intractata*, *C.?* *anomioides* (p. 188); *Selenis æqualis*, *vacillans*, *inæqualis* (p. 189); *Ginæa pectoralis* (p. 190); *Daona* (g. n.) *mansueta* (ibid.); *Vescisa* (g. n.) *commoda* (p. 191); *Ausiuza* (g. n.) *æqua* (p. 192); *Astygisa* (g. n.) *larentiata* (ibid.), *metaspila* (p. 193); *Murgisa* (g. n.) *orgyoides* (ibid.); *Detonanda* (g. n.) *spurcata* (p. 194); *Bagistana* (g. n.) *rudis* (ibid.); *Dumatha* (g. n.) *herbida* (p. 195); *Badiza* (g. n.) *ereboides* (p. 196).

GEOMETRIDÆ.

GUENÉE (Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 13) discusses

the position of the *Ænochromides*, which he regards as true *Phalénites*, distinguished by having the antennæ pectinated only on one side, and as uniting the *Phalénites* with the *Bombycina* in respect of their general appearance. The relationship of these insects to the *Geometridæ* is proved by the structure of the larva of *Ænochroma vinaria* (Guen.), here described and figured (*l. c.* p. 14, pl. 1. fig. 1) from a drawing sent to H. Doubleday from Australia by Diggles. This larva is of an elongated form, and has *three pairs* of membranous feet; upon the back of the third segment it has a black, conical, erect spine, and at the apex of the eleventh two small conical processes. Its colour above is brown, beneath white, with some black spots. It is found in May upon the Wattle tree (*Mimosa*, sp.), and the moth appears in October. The caterpillar differs from those of most *Geometridæ* in the presence of a third pair of membranous feet; but this occurs, although in a rudimentary state, in the genus *Rumia*, and in a more perfect condition in *Metrocampa*, both belonging to the *Eunomides*, near which Guenée has already placed the group of *Ænochromides*.

Breyer (*Ann. Soc. Ent. Belge*, 1863) describes and figures the larvæ of the following species of this family: *Eupithecia tenuiata* (Hüb.), *l. c.* p. 25, pl. 1. fig. 2; *E. debiliata* (Hüb.), *l. c.* p. 27, pl. 1. fig. 3; *E. valerianata* (Hüb.) = *viminata* (Dbl.), *l. c.* p. 31, pl. 1. fig. 4; *Scodonia belgaria* (Hüb.), *l. c.* p. 33, pl. 1. fig. 5; and *Phasianæ petraria* (Esp.), *l. c.* p. 37, pl. 1. fig. 6. The same author also states that the larva of *E. denotata* (Hüb.) lives in the capsules of *Campanula trachelium*, and mentions his having bred *E. dodoneata* (Guen.) from larvæ feeding on oak (*l. c.* p. 41).

Breyer also describes (*l. c.* pp. 45, 46) a peculiar structure in the caterpillars of *Anisopteryx aceraria* and *æscularia* (S. v. Voll.). In these larvæ the last pair of abdominal prolegs is represented by a pair of pediform organs, which are protruded from two apertures on the tenth segment; they are not prehensile, but seem to form organs of touch.

Masters (*Proc. Ent. Soc. N. S. W.* p. xxiv) describes the male of *Gastrophora henricaria* (Guenée).

Guenée states that *Ænochroma quaternaria* (H. Sch.) is a variety of the male of *Phallaria ophiuraria* (Guen.). *Ann. Soc. Ent. Fr.* tome iv. p. 16.

The preparatory states of the following species of this family are referred to in notes published in the 'Zoologist' for 1864: *Oporabia filigrammaria* (larva) by J. Hellins, *l. c.* p. 8913; *Cidaria sagittata* (larva) by J. Hellins, *l. c.* p. 8913, and by W. Farren, *l. c.* p. 8970; *Numeria pulveraria* (larva) by F. Bauchamp, *l. c.* p. 8970; *Eupithecia fraxinata* (varieties of larva) by H. H. Crewe, *l. c.* p. 9252; *E. pulchellata* (transform. and vars. of larva) by H. H. Crewe, *l. c.* p. 9253, and by J. Hellins, *l. c.* p. 9260; *E. campanulata* (larva and pupa) by H. H. Crewe, *l. c.* p. 9260; and *Thera coniferata* (larva) by Jos. Greene, *l. c.* p. 9333.

The larvæ of the following species are described by E. Newman, Entomologist, vol. ii.: *Angerona prunaria* (p. 10), *Amphydasis prodromaria* (p. 11), *Anticlea rubidata* (p. 12), *A. badiata* (p. 13), *A. derivata* (p. 19),

Ephyra trilinearia (p. 17), *Coremia unidentaria* (p. 19), *Larentia cæsiata* (p. 32), *Cidaria ribesaria* (p. 33), *Corycia tenerata* (p. 125), *Aspilates citraria* (p. 125).

D'Orville has published some notes on *Coremia ferrugata* and *C. unidentaria*, which he has bred from the egg, and which he declares to be always distinct. The similarity of the larvæ he supposes to have given rise to the notion of their identity. Ent. M. Mag. vol. i. p. 92.

J. Hellins (Notes on various Lepidoptera, Zoologist, 1864, pp. 8985-8990) refers to several species of this family: *Cidaria psitticata*, *C. picata*, *C. corylata*, *C. russata*, *C. immanata*, *C. silaceata*, *C. populata*, *C. prunata*, *Anticlea rubidata*, *A. badiata*, and *A. derivata*. Most of his notes relate to the larvæ of these species, but the paper also contains a discussion of the distinctive characters of *C. russata* and *immanata*.

J. Hellins describes the development of *Cidaria russata* and *C. immanata*, which he regards as two distinct species, having *saturata*, *perfuscata*, *centum-notata*, and *comma-notata* as varieties of the former, and *marmorata* as a variety of the latter. Ent. M. Mag. vol. i. pp. 165-167.

J. Hellins describes the larva of *Lozogramma pictaria*, which feeds on the common Bracken (*Pteris aquilina*). Ent. M. Mag. vol. i. p. 71.

The same author describes the larva of *Acidalia immutata*, which feeds on *Polygonum aviculare*. L. c. p. 72.

The larvæ of *Oporabia filigrammaria* and *Cidaria sagittata* are described by Hellins and Buckler. Ent. Ann. 1864, pp. 137-139.

Harpur-Crewe describes the metamorphoses of *Eupithecia pulchellata*, the larva of which feeds upon the stamens and pistil of the common foxglove (Ent. M. Mag. vol. i. p. 95), and those of *E. lariciata* and *E. campanulata* (l. c. pp. 141-142).

Crewe (Ent. Ann. 1865, pp. 117-127) has also published notes on the preparatory states of several species of the genus *Eupithecia*. The species referred to are *E. debiliata* (Hüb.), *E. pulchellata* (Steph.), *E. lariciata* (Frey), *E. campanulata* (H. Sch.), *E. fraxinata* (Crewe), *E. pygmeata* (Hüb.), and *E. plumbeolata* (Haw.). The same author gives a list (with references) of the larvæ of *Eupitheciæ* not noticed in Stainton's 'Manual,' but described since its publication.

Jos. Greene describes the larva of *Thera conferrata*. Ent. M. Mag. vol. i. p. 71.

Cidaria reticulata is figured in Entomologists' Annual for 1864, fig. 6.

Eupithecia campanulata is figured in Ent. Ann. 1865, fig. 6.

La Harpe remarks upon the following species taken by Meyer-Dürr near Lugano: *Acidalia asbestaria* (Zell.), *Boarmia consortaria* (Hüb.), *Larentia ablutaria* (Boisd.), and *L. nebularia*: Mittheil. Schw. Ent. Ges. 1864, pp. 173-176. And upon the following species from the Upper Engadine: *Acidalia flaveolaria*, *Gnophos meyeraria*, *Larentia incursaria*, *L. valesiaria*, *Eupithecia arcenthata*, and *Odezia chærophyllaria*: l. c. pp. 179-183.

New species :—

Acidalia subversaria, Laharpe, Nouv. Mém. Soc. Helv. Sci. Nat. pp. 5 & 6, Switzerland.

Monoctenia hypotaniaria, Guenée, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 15; and *M. digglesaria*, Guenée, ibid., from Australia.

Hypographa serpentaria, Guenée, l. c. p. 16, from Australia.

Amphidasys cupidaria, Grote, Proc. Ent. Soc. Phil. vol. iii. p. 534, pl. 6. fig. 8, from the Middle States.

Epione depontanata, Grote, l. c. p. 90, pl. 2. fig. 7, from Maryland.

Tetracis lorata, Grote, l. c. p. 91, from the Eastern and Middle States.

Eupithecia incinerata, La Harpe, Mittheil. Schweiz. entom. Gesellsch. February 1864, p. 174, from the Ticino.

PYRALIDÆ.

Millière describes and figures the different states of *Hæmerosia renalis* (Hübner.) The larva feeds on the flowers of certain species of *Lactuca*, and other composite plants. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 195, 196, pl. 5. figs. 5-5 d.

Fologne describes and figures a six-spotted variety of *Ennychia octomaculalis*. Ann. Soc. Ent. Belge. tom. vii. p. 125, pl. 3. fig. 4.

Laharpe remarks on *Botys rubiginalis*, taken by Meyer-Dürr near Lugano, Mittheil. Schw. ent. Ges. 1864, p. 177; and on *Botys porphyralis*, *B. rhododendronalis*, *Crambus monochromellus* (H.-Sch.), the distinctness of which he doubts, and *Homæosoma flaviciliella* (H.-Sch.), from the Engadine, l. c. pp. 183, 184.

C. G. Barrett describes the habits of *Madopa salicalis*, and of some other species, Ent. M. Mag. vol. i. p. 74; and the larva of *Eudorea coarctalis*, Zool. 1834, p. 8916.

New species :—

Hercyna conspurcalis, Laharpe, Nouv. Mém. Soc. Helv. Sci. Nat. p. 34, Switzerland.

Botys vittalis, Laharpe, l. c. p. 33, and *B. deceptalis*, Lah. l. c. p. 37, Switzerland.

Eudorea conicella, Laharpe, l. c. p. 41; *E. imparella*, Lah. l. c. p. 42, Switzerland.

Crambus scirpellus, Laharpe, l. c. p. 46, Switzerland.

Crambus inornatellus, Clemens, Proc. Ent. Soc. Phil. vol. ii. p. 418, from Labrador.

Walker (List Lepidopt. Ins. xxx.) has published in an appendix the following species of Crambites additional to those described in part xxvii (1863) :—

Pontala (g. n.) *rubrana* (p. 954), Parà. *Homæosoma bilituralis* (p. 955), Sarawak. *Acrobasis*? *imbella* (p. 955), Cape. *Nephopteryx*? *phycisella* (p. 957), Ceylon. *Nephopteryx neglectalis* and *N. infractalis* (p. 958), Sarawak. *Addyme illectalis* (p. 959), Sarawak. *Lamoria*? *rufivena* (p. 960), Sarawak. *Tirathaba* (g. n.) *mundella* (p. 961), Sarawak. *Cadra* (g. n.) *defectella* (p. 962), Ceylon. *Masthala* (g. n.) *flavillatella* (p. 962), Australia? *Aroua* (g. n.) *mirificana* (p. 933), Ega. *Ma iama* (g. n.) *nigroscitalis* (p. 964), Sierra Leone. *Cophanta* (g. n.) *funestalis* (p. 964), Sarawak. *Cyiza* (g. n.) *punctalis* (p. 965),

Sarawak. *Chilo dodatellus* (p. 966), Ceylon; *Ch. aditellus* (p. 967), Hindostan; *Ch. gratiosellus* (p. 967), East Indies. *Eromene auriscriptella* (p. 976), New Zealand. *Tomissa* (g. n.) *concisella* (p. 978), and *T. ? fervidella* (p. 979), Sarawak. *Phachthia* (g. n.) *lignigeralis* (p. 979), Sarawak. *Erupa* (g. n.) *chiloides* (p. 980), Brazil.

TORTRICIDÆ.

Anchylopera. Clemens (Proc. Ent. Soc. Phil. vol. iii. p. 509) proposes a division of this genus into groups in accordance with the venation of the wings, which he illustrates by means of diagrammatic woodcuts. The following is his arrangement:—

Group I. Hind wings with median vein 3-branched.

§ Tip of fore wings acutely produced. Type *A. spireæfoliana*.

§§ Tip of fore wings not acutely produced. Type *A. striatana*.

Group II. Hind wings with median vein 4-branched.

§ Tip of fore wings acutely produced. Type *A. ocellana*, n. sp.

Group III. Hind wings with median vein 4-branched.

§ Tip of fore wings not acute, sometimes obtusely produced. Type *A. costomaculana*.

Antithesia bipartitana. Clemens describes a Labradorian variety of this species. Proc. Ent. Soc. Phil. vol. ii, p. 418.

Wahnschaffe (Berl. ent. Zeits. 1864, pp. 313–317) describes the transformations of the Green Oak-Tortrix (*T. viridana*), and the ravages committed by its larva in 1863 on the oaks of the Thiergarten at Berlin.

Breyer (Ann. Soc. Ent. Belg. 1863, p. 43) describes the transformations of *Olindia ulmana* (Hübner).

Laharpe remarks on *Sciaphila abrasana* and *Penthina gentianana*, Mitthell. Schw. ent. Ges. 1864, pp. 177, 178; and on *Conchylis deutschiana* (Zett.) = *C. lutulentana* (H.-Sch.), *C. valdensiana*, *C. pallidana*, *Sciaphila wahlborniana*, *Sericoris horridana*, *S. palustrana*, *S. irriguana*, *S. spuriana*, *S. cæspitana*, *Pædisca sublimana*, and *Phoxopteryx comptana* and *incomptana*, Mitth. Schw. ent. Ges. 1864, pp. 184–189.

B. Piffard publishes some remarks on the habits of *Pædisca oppressana* (Treits.). Ent. M. Mag. vol. i. p. 51.

Newman (Entomologist, vol. ii.) describes the larvæ of *Tortrix viburnana* (p. 62) and *Peronea caledoniana* (p. 63).

New species:—

Anchylopera. Of this genus Clemens describes eight new North American species (Proc. Ent. Soc. Phil. vol. iii.): namely, Group I. (see ante), *Anchylopera pulchellana*, l. c. p. 511, from Maine; *A. fuscociliata*, l. c. p. 512, and *A. dubiana*, ibid., from Virginia; and *A. lamiana*, l. c. p. 513, from Maine. Group II. *A. ocellana*, l. c. p. 510, from Maine. Group III. *A. mediofasciata*, l. c. p. 511, and *A. fasciolana*, ibid., from Maine; and *A. virginiana*, l. c. p. 512, from Virginia.

Anchylopera plagosana, Clemens, Proc. Ent. Soc. Phil. vol. ii. p. 417, from Labrador.

Hedya. Clemens describes six new North American species of this genus:

Hedya deludana, l. c. p. 513, *H. spoliata*, ibid., *H. cressoniana*, l. c. p. 514, and *H. signatana*, ibid., from Virginia; *H. salicicolana*, ibid., and *H. saliciana*, l. c. p. 515, bred from mining larvæ in willow-galls at Rock Island, Illinois.

Ditula ? *blandana*, Clemens, l. c. p. 515, from Maine.

Cnephasia maculidorsana, Clemens, l. c. p. 516, from Maine.

Peronea flavivittana, Clemens, l. c. p. 516, from Virginia; *P. gallicolana*, Clem. ibid., from willow-galls at Rock Island, Illinois.

Cræsia. Clemens (Proc. Ent. Soc. Phil. vol. iii.) describes four new North American species which he believes to belong to this genus: namely, *Cræsia* ? *unifasciata*, l. c. p. 516; *C.* ? *fulvroseana*, ibid., from Maine; *C.* ? *virginiana*, l. c. p. 517, from Virginia; and *C.* ? *gallivorana*, ibid., from larvæ living in willow-galls at Rock Island, Illinois.

Ptycholoma ? *semifuscana*, Clemens, l. c. p. 519, from Virginia.

Steganoptycha ? *ochreana*, Clemens, l. c. p. 520, from Virginia; *S. variana* Clem. ibid., from Maine and Pennsylvania.

Halonota packardiana, Clemens, l. c. p. 417, from Labrador.

Lozopera ? *fuscostrigana*, Clemens, l. c. p. 417, from Labrador.

Conchylis rheticana, Laharpe, Mittheil. Schw. ent. Ges. February 1864, p. 184, from the Upper Engadine.

Phoxopteryx luana, Laharpe, l. c. p. 76, Switzerland.

Walker (List Lepidopt. Ins. xxx.) has published in an appendix the following species of Tortricites additional to those described in parts xxvii and xxviii (1863):—

Teras ? *accusana* (p. 983), New Zealand. *Pandemis dispilana* (p. 983), Bootan. *Sciaphila indivisana* (p. 98) Hudson's Bay; *Sc.* ? *diffusana* (p. 986), South Australia; *Sc. infimana* (p. 986), New Zealand. *Conchylis sumirectana* and *C. a'bidana* (p. 987), Sydney. *Grapholita confertana* (p. 990), Sierra Leone; *G. dentatana* (p. 991), Sydney; *G. abnegatana* (p. 991), New Zealand. *Carpocapsa trajectana* (p. 992), Sydney. *To p.tis illa alis* (p. 994), Sarawak. *Thapava* (g. n.) *natalina* (p. 995), Port Nat l. *Savoca* (g. n.) *sarawakana* (p. 996). *Simæthis onustana* (p. 993), Nova Scotia; *S.* ? *abstittella* (p. 997), New Zealand. *Orosana* ? *carpocapsella* (p. 998), Moreton Bay; *O.* ? *percussana* (p. 998), Tasmania; *O.* ? *beatella* (p. 999), Australia. *Inapha* (g. n.) *lampro-nialis* (p. 1000), Sarawak. *Eudua* (g. n.) *hesperialis* (p. 1000), Sarawak. *Chalenata* (g. n.) *micaceella* (p. 1001), Ega.

TINEIDÆ.

SAUVEUR and FOLOGNE have published (Ann. Soc. Ent. Belge, tome vii. p. 95 *et seq.*) a complete list of the Tineina discovered up to the present date in Belgium, arranged in accordance with Stainton's system. The total number of species included in this catalogue is 490, showing an increase of 170 known species since the publication of De Fré's catalogue of Belgian Tineina in 1858. The name of each species is accompanied by a reference to the notice of its discovery in Belgium contained in previous volumes of the 'Annales.'

STANTON has published (Ent. Trans. 3rd ser. vol. i. pp. 637-655) a revision of the European species of the genus *Cosmopteryx*, Hübner, as restricted by Zeller. He enumerates six species, three of which are found in Britain:—

The species are: *C. lienigiella*, Zell.; *C. scribaiella*, Zell.; *C. eximia*, Haw. (= *drurella*, Staint.); *C. schmidiella* Frey; *C. orichalcea*, Staint.; and *C. druryella*, Zell. The first, third, and fifth are British species. The species described by Fabricius under the name of *Tinea drurella*, and that figured by Hübner, and named *T. zieglerella*, formerly supposed by Stainton to be identical with his *C. drurella*, are regarded as incapable of identification with any of the species at present known, and their names are dropped out of the synonymy. The larvæ of three of the species are known; they mine the leaves of various plants.

Coleophora. Mühlig (Stett. ent. Zeit. 1864, p. 160) maintains that Zeller's division of the species of this genus in accordance with the scaling of the base of the antennæ cannot be adopted, because an injury to this part certainly occurs frequently during the escape of the insect from its case: Mühlig holds (l. c. p. 161) that it is an impossibility to determine even uninjured specimens of this genus *without the possession of the case belonging to them!* As a contribution to the knowledge of these cases, and of the species forming them, Mühlig describes two species, namely, *Coleophora asteris*, n. sp., and *C. artemisiæ* (Mühl.), and their larva-cases. Mühlig also indicates (l. c. p. 165) the differences in the larva-cases and mode of life of *C. annulatella* (Tengstr.) and *C. flavaginella* (Zell.). (See Ent. M. Mag. vol. i. p. 77.)

Mühlig indicates certain differences in the larva-cases of *Coleophora olivaceella* (Staint.) and *C. solitariella* (Zell.), and also in the general aspect of the two insects, which lead him to believe that they are really distinct species. Stett. ent. Zeit. 1864, p. 102.

Fologne describes the larva and pupa of *Gelechia rufescens* (Haw.). Ann. Soc. Ent. Belge, tome vii. pp. 127-128, pl. 3. fig. 7.

Purasia lapella. H. Lucas has described the larva of this species as feeding, like that of a weevil, in the head of *Arctium lappa*. Ann. Soc. Ent. Fr. 4^e série, tome iv. p. 34, June 8, 1864.

Stainton (Ent. Ann. 1864, pp. 163-171) publishes notes on the larvæ of numerous species of this group, including *Gelechia lutatella*, *G. rufescens* (the larva figured), *G. intaminatella*, *Tinagma resplendellum*, *Gracilaria scalarisella*, *Asychna profugella*, *Lithocolletis leucographella*, and *Nepticula sericopeza*, and *Nepticula*, sp. n.? The same author (Ent. Ann. 1865, pp. 132-142) notices the larvæ of *Theristes caudella*, *Depressaria petasitis*, *Gelechia lutatella*, *G. rhombella*, *G. hübneri*, *Nothris deflectivella*, *Eutalis cicadella*, *Argyresthia spiniella*, *Coleophora niveicostella*, *C. congeriella*, *Laverna decorella*, *Ochromolopis icella*, and *Phyllobrostis daphneella*.

C. Healy describes the characters and mode of life of the larva of *Micropteryx unimaculella*: Ent. M. Mag. vol. i. pp. 19-20. The same author suggests that *Mercurialis perennis* may be the food-plant of *Micropteryx mansuetella*, as he found the perfect moths pertinaciously flying about that plant: l. c. p. 22.

Healy also describes the larvæ of *Adela degeerella*, and refers to some points

in the economy of those of *Incurvaria muscalella*, *Solenobia inconspicuela*, and various species of *Lithocolletis*. Zoologist, 1864, pp. 9065-9067.

The same author describes the economy of *Antispila treitschkiella* and *A. pfeifferella*. Entomologist, vol. ii. pp. 126-130.

Newman describes the larva of *Argyresthia nitidella*. Entomologist, vol. ii. p. 63.

Haberlandt has described the mode of life of *Tinea pyrophagella* (Koll.), and indicated the injury inflicted by its larvæ upon grain. Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 915-920.

Amyot has described the ravages committed on lilacs by *Gracilaria syringella*, the caterpillars of which occasionally destroy the leaves of those shrubs, as if they had been affected by corrosive vapours. He gives an account of the life-history of this moth, and particularly describes the mode in which it rolls up the leaves of the lilac when it ceases its existence as a mining larva. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 1-12.

Clemens describes *Tinea tapetzella* (Lin.) as occurring in Virginia. Proc. Ent. Soc. Phil. vol. iii. p. 505. Clemens also describes a second specimen of his *Gelechia nigratomella*, differing in some respects from that on which the species was founded: l. c. p. 507.

Gartner has ascertained that *Anacamptis tenebrella* (Hüb.) and *A. tenebrosella* (Fisch. v. Rösl.) are the two sexes of the same species, by breeding them from identical larvæ which he discovered feeding beneath the bark of the main roots of *Rumex acetosella*, and afterwards observing their copulation. The larva is of a carmine-red colour, with the head and thorax brown; reddish white beneath; each segment bears two pairs of brown warts. Stett. ent. Zeit. 1864, pp. 158-160.

La Harpe remarks on *Æcophora knochiella* from Lugano, Mittheil. Schw. ent. Ges. 1864, p. 178; and on *Gelechia luctiferella* from the Engadine, l. c. p. 189.

Barrett remarks on the variation of *Gelechia humeralis*. Ent. M. Mag. vol. i. pp. 170 & 171.

Stainton (Ent. Ann. 1865) gives descriptions of *Depressaria olerella* (Zell.), l. c. p. 128, and *Gelechia pinguinella* (Tr.), l. c. p. 129.

Gracilaria. Stainton describes and figures the following species of this genus (Nat. Hist. Tineina, vol. viii.): *Gracilaria stigmatella* (Fab.), l. c. pp. 34-47, pl. 1. fig. 1; *G. swederella* (Thunb.), pp. 48-61, pl. 1. fig. 2; *G. semifascia*, (Haw.), l. c. pp. 62-71, pl. 1. fig. 3; *G. elongella* (Linn.) l. c. pp. 72-87, pl. 2. fig. 1; *G. syringella* (Fab.), l. c. pp. 88-99, pl. 2. fig. 2; *G. hemidactylella* (W. V.), l. c. pp. 100-109, pl. 2. fig. 3; *G. tringivennella* (Zell.), l. c. pp. 110-119, pl. 3. fig. 1; *G. limosella* (Zell.), l. c. pp. 120-127, pl. 3. fig. 2; *G. kollariella* (Zell.), l. c. pp. 128-137, pl. 3. fig. 3; *G. au oguttella* (Steph.), l. c. pp. 138-149, pl. 4. fig. 1; *G. omisella* (Sta.), l. c. pp. 150-157, pl. 4. fig. 2; *G. phasianipennella* (Hüb.), l. c. pp. 158-173, pl. 4. fig. 3; *G. ononidis* (Zell.), l. c. pp. 174-183, pl. 5. fig. 1; *G. pavoniella* (Zell.), l. c. pp. 184-193, pl. 5. fig. 2; *G. imperialella* (Mann.), l. c. pp. 194-203, pl. 5. fig. 3.

Ornix. Stainton describes and figures the following species of this genus (Nat. Hist. Tineina, vol. viii.): *Ornix guttea* (Haw.), l. c. pp. 222 & 233, pl. 1. fig. 1; *O. petiolella* (sp. n.), l. c. pp. 234-241, pl. 1. fig. 2; *O. torquillella* (Zell.),

l. c. pp. 242-251, pl. 1. fig. 3; *O. scoticella* (Sta.), *l. c.* pp. 252-261, pl. 2. fig. 1; *O. betulella* (Sta.), *l. c.* pp. 262-271, pl. 2. fig. 2; *O. loganella* (Sta.), *l. c.* pp. 272-279, pl. 2. fig. 3; *O. avellanella* (Sta.), *l. c.* pp. 280-291, pl. 3. fig. 1; *O. anglicella* (Frey), *l. c.* pp. 292-303, pl. 3. fig. 2; *O. fagivora* (Frey), *l. c.* pp. 304-311, pl. 3. fig. 3.

New genera :—

Walshia, Clemens, Proc. Ent. Soc. Phil. vol. ii. p. 418. Allied to *Laverna* and *Chrysoclista*; submedian and internal nervures of hind wings obsolete; fore wings with large thick tufts of scales. Sp. *W. amorphella*, Clem. p. 419, bred from galls on *Amorpha fruticosa*.

Hamadryas, Clemens, *l. c.* p. 422. Nearly allied to *Gelechia*; hind wings lanceolate, median nervure 3-branched; fore wings lanceolate, inner margin dilated near base, subcostal nervure with four branches. Sp. *H. bassettella*, Clem. p. 423, bred from oak-galls in Connecticut.

Cycloplasis, Clemens, *l. c.* p. 423. Allied to *Elachista*; hind wings excessively narrow, dilated near base, with very long cilia, median nervure very short, subcostal branchless. Sp. *C. panicifoliella*, Clem. p. 424, from Pennsylvania.

Wilsonia, Clemens, *l. c.* p. 428. Hind wings very narrow, acute, with very long cilia, costa dilated in middle, subcostal simple, obsolete at base, median nervure near inner margin, 3-branched; fore wings lanceolate, subcostal 5-branched, median nervure 4-branched; labial palpi recurved. Sp. *W. breviritellu*, Clem. p. 429, from Virginia.

New species :—

Brenthia virginella, Clemens, *l. c.* vol. iii. p. 505, from Virginia.

Ornix petiolella, Stainton, Nat. Hist. Tin. vol. viii. p. 234, *Ornix*, pl. 1. fig. 2.

Ornix boreasella, Clemens, Proc. Ent. Soc. Phil. vol. ii. p. 415, from Labrador.

Incurcaria labradorella, Clemens, *l. c.* p. 416, from Labrador.

Gelechia brunella, Clemens, *l. c.* p. 416, from Labrador; *G. ? ornatifimbriella*, Clem. *l. c.* p. 420, and *G. gallagenitella*, Clem. *ibid.*, and vol. iii. pp. 10 and 505, from Illinois; the latter bred from galls; *G. fungivorella*, Clem. *l. c.* vol. iii. p. 507, and *G. salicifungiella*, *l. c.* p. 508, bred by Walsh at Rock Island, Illinois, from larvae mining galls on species of *Salix*.

Gelechia triatonea, Mühlig, Stett. ent. Zeit. 1864, p. 101; *G. morosa*, Mühlig, *ibid.*

Gelechia lathyri, Stainton, Ent. Ann. 1865, p. 139, fig. 1 (= *G. nigricostella*, Staint. nec Dup.). Britain.

Gracilaria coroniella, Clemens, *l. c.* p. 421, from Illinois.

Gracilaria blandella, Clemens, *l. c.* vol. iii. p. 505, from Virginia.

Depressaria pulvipennella, Clemens, *l. c.* vol. ii. p. 421, from Illinois and Virginia; *D. cinereocostella*, Clem. *l. c.* p. 422, from Virginia.

Elachista brachyelytrifoliella, Clemens, *l. c.* p. 425, from Pennsylvania; *E. ? orichalcella*, Clem. *l. c.* p. 430, from Virginia.

Adela ridingsella, Clemens, *l. c.* p. 426, from Virginia.

Coleophora rosæfoliella, Clemens, *l. c.* p. 426, and *C. rosacella*, Clem. *ibid.*,

from Pennsylvania; *C. cratipennella*, Clemens, *l. c.* vol. iii. p. 506, from Virginia.—*C. asteris*, Mühlig, Stett. ent. Zeit. 1864, p. 162, Germany; *C. musculella*, Mühlig, *l. c.* p. 102.

Dasycera newmanella, Clemens, *l. c.* p. 428, from Virginia.

Ypsolophus flavivittellus, Clemens, *l. c.* p. 429, from Virginia.

Anezychia sparsiciliella, Clemens, *l. c.* p. 430, from Virginia.

Coriscium, sp. nov.?, Laharpe, Mittheil. Schw. ent. Ges. February 1864, p. 178, from Lugano.

Exapate duratella, Von Heyden, Mittheil. Schw. ent. Ges. Feb. 1864, p. 191, from the Upper Engadine.

Walker has continued his descriptions of Tineites, and described the following species in 'List of Lepidopt. Insects,' parts xxix. and xxx.:—

Depressaria. *D. confertella* (p. 563), Nova Scotia; *D. clausella* (p. 564), Georgia; *D. acerbella* (p. 564), Cape; *D. continctella* (p. 565), Hindostan; *D. sobriella* (p. 565), Australia; *D. moderatella* (p. 566), Tasmania; *D. constrictella* (p. 566) and *D. absumptella*, from Sydney.

Gelechia. From NORTH AMERICA (pp. 590–596):—*G. atterimella*, *adaptella*, *strictella*, *liturella*, *subtractella*, *attritella*, *attributella*, *conclusella*, *monstratella*, *cassella*, *absconditella*, *bellella*, *vagella*, *pallip. alpis*. From the WEST INDIES:—*G. donatella* (p. 596), Jamaica; *G. robustella* (p. 597), San Domingo; *G. attenuatella* (p. 1019), Jamaica. From EGA (Brazil) (pp. 597–627):—*G. solidella*, *transectella*, *subapicalis*, *trajectella*, *superfusella*, *accinctella*, *abruptella*, *binotatella*, *repanella*, *seductella*, *subscriptella*, *suspectella*, *versatella*, *scitella*, *sectella*, *turdella*, *cognatella*, *sublatella*, *monochromella*, *permundella*, *tactella*, *sumptella*, *dispicitella*, *subrectella*, *exteriorella*, *suffectella*, *tentatella*, *subjectella*, *perlatella*, *stelliferella*, *speciosella*, *selectella*, *smaragdula*, *secundella*, *susceptella*, *collocatella*, *secretella*, *quadrifascia*, *canofusella*, *superella*, *ostensella*, *triplagella*, *designatella*, *cinctella*, *quadrifascia*, *emissurella*, *rusticella*, *sejunctella*, *propriella*, *superatella*, *suffusella*, *subhusticella*, *liberatella*, *separatella*, *falcatella*, *extremella*, *succinctella*, *solella*, *semotella*, *intentella*, *niviliturella* (p. 1020), *secretella* (p. 1020), *discatella* (p. 1021), *serguttella* (p. 1021). From the CAPE:—*G. ahjunctella* (p. 629). From SIERRA LEONE:—*G. (?) auriferella* and *G. gemmatella* (p. 1022). From HINDOSTAN:—*G. transactella* (p. 630), *G. impactella* (p. 637). From CHINA:—*G. retractella* (p. 630). From CEYLON (pp. 630–637):—*G. sepositella*, *negatella*, *deductella*, *affvella*, *strenuella*, *cornutella*, *tetruspilella*, *agnatella*, *amicella*, *alienella*, *immetitella*, *arctella*, *patulella*, *aptatella*, *eucereella*, *albatella*, *angustella*, *animosella* (p. 1022), *alternella* (p. 1023), *obligatella* (p. 1023). From BORNEO (pp. 638–642):—*G. contentella*, *gammanella*, *mercurella*, *aridella*, *subservitella*, *pilosella*, *sublectella*, *transversella*, *invariella*, *biferrinella*, *calcaratella*. From AUSTRALIA (pp. 643–651):—*G. siccella*, *arrectella*, *bigerella*, *alternatella*, *suppletella*, *subnexella*, *marmoratella*, *sodalisella*, *advectella*, *constrictella*, *lactella*, *maestella*, *aversella*, *absumptella*, *rubicundella*, *xylopterella*, *suppressella*, *abductella*, *consuetella*. (pp. 1024–1027:) *G. simplexella*, *terrella*, *bistellella*, *rutilella*, *abolitella*, *subactella*, *vacatella*, *adactella*. From NEW ZEALAND (pp. 651–658):—*G. conspicuella*, *innotella*, *intactella*, *monospilella*, *adaptella*, *adrectella*, *sublitella*, *flamatella*, *flavidella*, *collitella*, *convulsella*, *contextella*, *contritella*, *subditella*, *bifaciella*, *peroneanella*, *apparitella*

(p. 1027), *copiosella* (p. 1028). From SANDWICH ISLANDS:—*G. incertulella* (p. 658). COUNTRY UNKNOWN:—*G. spoliatella* (p. 659).

Symphronia excisorella (p. 665), Ega. *Hypercallia igniferella* (p. 670), Moreton Bay.

Æcophora. From BORNEO:—*Æ. bitinctella* (p. 675). From AUSTRALIA (pp. 677–698):—*Æ. lætiorella*, *divisella*, *concißella*, *terminella*, *ustella*, *aspectatella*, *electella*, *retractella*, *resumptella*, *comparella*, *alternella*, *confusella*, *partitella*, *triferella*, *semiruptella*, *tentatella*, *divisella*, *irruptella*, *conjunctella*, *latifissella*, *declivisella*, *molliculella*, *carella*, *productella*, *matutinella*, *adaptatella*, *parabolella*, *subparallela*, *propriella*, *subnerella*, *nerella*, *interlineatella*, *aurinatella*, *xanthiella*, *subpunctella*, *acceptella*, *angustella*, *subductella*, *connexella*, *semifusella*, *bracteatella*, *gloriosella*, *æmulella*. (pp. 1029–1034):—*Æ. quadratella*, *translatella*, *honoratella*, *compositella*, *retractella*, *acutella*, *contentella*, *abruptella*, *fissulella*, *mediella*, *hepialella*, *amotella*. From NEW ZEALAND (pp. 698–700):—*Æ. aperrella*, *armigerella*, *ademptella*, *picarella*, *hamatella*.

Cryptolechia. From NOVA SCOTIA:—*C. algidella* (p. 710). From SAN DOMINGO:—*C. strigosella* (p. 710). From VENEZUELA:—*C. leucaniella* (715), *acustella* (p. 726). From EGA (Brazil) (pp. 714–745):—*C. tectella*, *nonagriella*, *quadratella*, *humerebella*, *ferrocanebella*, *recurvella*, *suppressella*, *completella*, *venosella*, *chalybæella*, *basirubrella*, *impressella*, *lativittella*, *reductella*, *pauperatella*, *depressariella*, *straminella*, *tortricella*, *tetragonella*, *subnotatella*, *leucophæella*, *aratella*, *fusistrigella*, *armiferella*, *adjunctella*, *additella*, *absconditella*, *incensatella*, *lucidiorella*, *nitidorella*, *pustulatella*, *consociella*, *brevisella*, *reciprocella*, *confixella*, *indicatella*, *externella*, *acontiella*, *tripustulcella*, *receptella*, *megaspilcella*, *humiferella*, *incisurella*, *strenuella*, *congressella*, *costatella*, *inturbatella*, *mundella*, *conturbatella*, *illucidella*, *graphopterebella*, *umbriferella*, *adductella*, *semisignella*, *consociella* (p. 741) *, *impactella*, *ovarella*, *scitiorella*, *murinella*, *filiferella*, *basiferella*, *rubiginebella*, *severella* (p. 1035), *tremulella* (p. 1035). From PORT NATAL:—*C. cariusella* (p. 746). From CEYLON:—*C. spiotella* (p. 746). From JAVA:—*C. (?) atratella* (p. 746). From BORNEO:—*C. simulatella* (p. 747), *C. (?) attenuatalis* (p. 1030), *C. niveosella* (p. 747), *C. suffusella* (p. 748). From AUSTRALIA (pp. 749–768):—*C. flavolineata*, *bipunctella*, *luteolatella*, *argentella*, *placidella*, *cognatella*, *nivella*, *cygnella*, *reversella*, *abrosella*, *privatella*, *triphenatella*, *incarnatella*, *absumptella*, *latiorella*, *sordidella*, *magniferella*, *undulatella*, *tripunctella*, *murinella*, *ferro-rubella*, *confectella*, *afflictella*, *inceptella*, *æcophorella*, *pudorinella*, *marginella*, *quadripustulcella*, *abstersella*, *abakenella*, *transversella*, *fadatella*, *amissella*, *indecorella*, *turbatella*, *scopariella*, *gelidella*, *acutella*, *inclusella*, *circulatella*, *dejunctella* (p. 1036). From NEW ZEALAND (pp. 768, 769):—*C. coarctatella*, *colligatella*, *lichenella*. COUNTRY UNKNOWN (pp. 769–772):—*C. spurcatella*, *metaphæella*, *graphiphorella*, *porphyrinella*, *contrariella*, *albulcella*, *iniscitella*.

Antæotricha umbratella (p. 773), Ega.

Palparia. *P. aurata* (p. 774), *rectiorella* and *aurigena* (p. 775), *confectella* (p. 776): from Australia.

Tortricopsis semijunctella (p. 777), Sydney.

* Mr. Walker has requested us to change this name, which he previously (p. 730) used for another species of the same genus, into *batesiella*.—Ed.

The following species are described as types of new genera :—

Cimitra seclusella (p. 780), Ceylon. *Tinissa torvella* (p. 780), Hab. — ?
Ippa vacivella (p. 781), North Hindostan. *Gerontha captiosella* (p. 782),
 Ceylon. *Timyra phycisella* (p. 783), Ceylon. *Oscella aneonivella* (p. 784),
 Venezuela. *Phlongia ferrarenella* (p. 785), Hab. — ? *Saфра bogotatella* (p.
 785), Bogota. *Casupe pauculella* (p. 786), Venezuela. *Izatha attactella* (p.
 787), New Zealand. *Chezala allatella* (p. 788), Australia. *Tonica terasella*
 (p. 788), Borneo. *Opisina arenosella* (p. 789), Hab. — ? *Zaratha ptero-*
dactylella (p. 790), Ega. *Tiriza leucotella* (p. 791), Sarawak. *Togia nemo-*
phorella (p. 792), Sarawak. *Onebala blandiella* (p. 792), Ceylon. *Tisis bico-*
lorella (p. 793), Sarawak. *Gaphara recitatella* (p. 794), Ceylon. *Ficulea*
blandulella (p. 795), Ceylon. *Frisilia nesciatella* (p. 796), Ceylon. *Tonosa*
seclusella (p. 793), Sarawak. *Decuaria mendicella* (p. 797), Ceylon. *Tin-*
genera meliorella (p. 793), Sarawak. *Tipha chalybaella* (p. 799), Sarawak.
Taruda cuneatella and *T. apicella* (p. 800), Ega. *Ussara decoratella* (p. 801)
 and *U. repletana* (p. 1037), Ega. *Coydalia interguttella* (p. 1038), Sarawak.
Thema brevicittella (p. 802), Australia. *Carna* (name substituted, p. 1038, for
Rhobonda, p. 802) *punctatella* (pp. 802, 1038), Ega. *Vazugada strigiplenella*
 (p. 803), Ega. *Gæsa decusella* (p. 804), Ceylon. *Tipasa basaliella* (p. 805),
 Ceylon. *Tocmia versicolorella* (p. 806), Ega. *Tirallis latifasciella* (p. 806) and
T. (?) innotatella (p. 807), Sarawak. *Tigava scitissimella* (p. 807), Moreton
 Bay. *Topaza alienella* (p. 808), Sarawak. *Tomara tigrinella* (p. 809), Sarawak.
Tingena bifaciella (p. 810), New Zealand. *Titulcia eximia* and *confictella* (p. 811),
 Sarawak. *Tituacia deriella* (p. 812), Sarawak. *Tisobarica jucundella* (p. 813),
 Sydney. *Titana adelella* (p. 814), Sarawak. [*Thubana bisignatella* (p. 814),
 Sarawak]*. *Gargela subpurella* (p. 815), Ceylon. *Barantola pulcherrima* (p.
 816), Moreton Bay. *Tamarrha gelidella* (p. 817), Jamaica, and *T. nivosella*
 (p. 817), Jamaica and S. Domingo. *Tirasia punctigenera's* (p. 818), Sarawak.
Rhitia congestella (p. 819), Sarawak. *Barea consignatella* (p. 819), Moreton
 Bay. *Trisizima ceratella* (p. 820), Hindostan. *Fanicela disjunctella* (p. 1039),
 New Zealand. *Gasmara calatella* (p. 1040), Ceylon. *Patouissa dissonella* (p.
 821), Sarawak. *Tiva binotella* (p. 822), Sarawak. *Marista basivitta* (p. 823),
 Australia. *Labdia deliciosella* (p. 823), Australia. *Bida crambella* (p. 824),
 South Australia. *Thudaca obliquella* (p. 825), Australia. *Uzucha humeralis*
 (p. 826), Moreton Bay. *Maroga gigantella* (p. 827), South Australia and
 Tasmania. *Uipsa perionella* (p. 828), Ceylon. *Pæpia carpocapsella*, *con-*
tortella, *xanthophæella*, and *retustella* (pp. 829, 830), Ega. *Tisdra obtusella*
 (p. 831), Sarawak. *Nosymna repletella* (p. 831), Sarawak. *Binsitta nivi-*
ferana (p. 832), North Hindostan. *Exodomorpha divisella* (p. 833), inclu-
 sella and *derogatella* (p. 834), Port Natal. *Urbara galeata* (p. 835), Ega.

Glyphypteryx. *Gl. (?) dimidiatella* (p. 839), Cape; *seilulella* and *apparitella*
 (p. 839), Ceylon; *perornatella* (p. 840), North China; *receptella* (p. 840),
 Sydney; *externella* and *scintellella* (p. 841), New Zealand.

Argyresthia transversella and *stilbella* (p. 849), New Zealand; *A. (??) per-*
ornatella (p. 1040), North China.

Gracilaria terminella (p. 855), *confectella* and *delicatulella* (p. 856), Austra-
 lia; *frontella* (p. 856) and *arenosella* (p. 857), New Zealand.

* Identical with *Tiva binotella*, pp. 822, 1038.

Elachista lativittella, Sydney; and *E. subpavonella* (p. 898), New Zealand. *Cachura* (g. n.) *objectella* (p. 918), Ceylon (*Lyonetidae*).

Walker (List Lepidopt. Ins. xxx.) has also published in an appendix other species of *Tineites* additional to those described in 1864 (part xxviii.):—

Tinea afflictella (p. 1002), Hudson's Bay; *T. ignotella* (p. 1003), Sierra Leone; *T. rejectella* and *T. incultella* (p. 1003), Cape; *T. inconcisella* (p. 1004), *arenatella* and *egenella* (p. 1005), Ceylon; *T. oecophoroides* (p. 1005), *adjunctella* and *mystacinella* (p. 1006), Moreton Bay; *T. comptella* (p. 1007), Tasmania; *T. bisignella* (p. 1007), *fusilella* and *maoriella* (p. 1008), New Zealand. *Tonza* (g. n.) *purella* (p. 1011), Moreton Bay; *T. ? cumdatella* (p. 1012), Sydney. *Manliana* (g. n.) *astrictella* (p. 1012), Sydney. *Deua* (g. n.) *imbustana* (p. 1013), Ega. *Maepha* (g. n.) *epulentana* (p. 1014), Ega. *Vobrix* (g. n.) *innotata* (p. 1014), Sarawak. *Saptha* (g. n.) *divitiosa* (p. 1015), Ceram. *Ascha* (g. n.) *reconditana* (p. 1016), Ega. *Psecadia abraxasella* (p. 1016), San Domingo.

PTEROPHORIDÆ.

Schleich describes the transformations of *Pterophorus didactylus* (Linn.), Stett. ent. Zeit. 1864, pp. 96–99. The larva feeds on the flowers of *Geum rivale*, eating through the calyx, and devouring the corolla and receptacle, but without inserting more than the fore part of its body. During the day the larva adheres to the flower-stalks, and only begins feeding towards evening. When about to change, the larva attaches itself by the tail in the manner of the caterpillars of the butterflies.

Stainton (Ent. M. Mag. vol. i. p. 11–14) calls attention to Schleich's observations on the larva of *Pterophorus didactylus* (Lin.), and indicates that his discovery of the larva feeding on *Geum rivale* proves its identity with the Linnean species.

J. Peers describes the larva of *Pterophorus trigonodactylus*. Entomologist, vol. ii. p. 38.

Walker describes (List Lepidopt. Ins. xxx.):—

Agdistes pustulalis (p. 927), Cape. *Platyptilus argyriodactylus* (p. 929), Ceylon; *Pl. emissalis* (p. 930), Sydney; *Pl. falcatalis* and *repletalis* (p. 931), New Zealand. *Oryptilus pusillidactylus* (p. 933), Jamaica; *O. nanellus* (p. 933), Ega; *O. direptalis* (p. 934), Cape, Congo; *O. anisodactylus* (p. 934), Ceylon; *O. idonealis* (p. 935), Sarawak; *O. cinctipedalis* (p. 935), Moreton Bay. *Pterophorus petrodactylus* (p. 940), Arctic America; *Pt. homodactylus* (p. 941), United States; *Pt. agraphodactylus* (p. 941), San Domingo; *Pt. aspidodactylus* (p. 942), Jamaica; *Pt. umbrigeralis* (p. 942), Bogota; *Pt. impersonalis* (p. 942), Venezuela; *Pt. longalis* (p. 943), Cape; *Pt. defectalis* (p. 943), West Africa; *Pt. rutilalis* (p. 943), Port Natal; *Pt. congrualis* (p. 943), East Indies; *Pt. oxydactylus* (p. 944), Ceylon; *Pt. canalis* (p. 944), Sydney; *Pt. diffusalis* and *oblitalis* (p. 945), Moreton Bay; *Pt. innotatalis* (p. 945) and *Pt. deprivatilis* (p. 946), New Zealand. *Aciptilus candidalis* (p. 948), Sierra Leone; *A. lacteipinnis* (p. 949), Hindostan; *A. leucodactylus* (p. 949), Ceylon; *A. similis* (p. 949), Borneo; *A. aptalis* (p. 950), Sydney; *A. furcatalis* and *monospilalis* (p. 950), New Zealand. *Utuca* (g. n.) *ochracealis* (p. 951), Ega. *Sochchora* (g. n.) *donatella* (p. 952), Ega.

DIPTERA.

A. *Separate Publications.*

LOEW, H. Monographs of the Diptera of North America. Part II. Edited by R. Osten-Sacken. Smithsonian Miscellaneous Collections, 171. 8vo, pp. xi & 360, with 5 plates. Washington, 1864.

In this work Dr. Loew has not only furnished us with a complete monograph of the American species of the difficult family of the *Dolichopodidæ*, but has also characterized the whole of the known genera. The genera and species are described in considerable detail, and their investigation is greatly facilitated by carefully prepared tables. Including the genus *Rhagoneurus* (= *Rhageneura*, Rond.), of which a modified character is given by the author in his supplement, the total number of genera admitted is 44, of which 29 are represented in North America. The total number of well-ascertained North-American species described by Loew is 175; but he includes in this list some from the tropical parts of the western continent, and even from the West Indies and Venezuela. Of the American species 41 are described as new. Loew has frequently found the descriptions given by former writers quite inapplicable to any species with which he is acquainted; these descriptions are quoted at length under the genera to which the species described appear to belong, so that his monograph may be said to include the whole body of literature on the *Dolichopodidæ* of North America. The plates appended to the volume contain representations of illustrative species of each of the 44 genera admitted by the author, showing the general form of the animals and the more important details of their structure.

Loew remarks (*op. cit.* pp. 321 & 322) that the North American fauna appears to be particularly rich in *Dolichopodidæ*. He indicates as peculiarities in it the number of species of *Pelastoneurus*, the number of closely allied species of *Gymnopternus*, the number of species of *Chrysotus* distinguished by plastic characters, and the abundance of species of *Diaphorus* and allied forms, and remarks on the singular coincidence in these respects between the North-American fauna and that of which the remains have come down to us preserved in amber.

As regards the geographical distribution of the *Dolichopodidæ* the author's investigation of the North-American species leads him to the following results. The North-American fauna closely approaches the European and North-Asiatic in the species of *Hygroceleuthus*, *Dolichopus*, *Tachytrechus*, *Campsicnemus*, *Scellus*, *Hydrophorus*, *Liancalus*, *Chrysotimus*, and *Xanthochlorus*, whilst its relation to the South American is shown by the species of

Paraclius, *Pelastoneurus*, *Lyroneurus*, and *Plagioneurus*. *Gymnopternus* is but scantily represented in Europe. The species of *Diaphorus* are partly of European, partly of South-American types. Species common to Europe and North America are *Dolichopus brevipennis* (Meig.), *D. plumipes* (Scop.), *D. discifer* (Stann.), *Scellus spinimanus* (Zett.), and *Psilopus pallens* (Wied.). *Diaphorus opacus* (Loew) is also possibly identical with *D. nigricans* (Meig.), and *Xanthochlorus helvinus* (Loew) with *X. tenellus* (Wied.). With regard to *Psilopus pallens*, however, Loew is of opinion that, as all the other known North-American species of this genus approach South-American types, it has probably been introduced into New York from the South of Europe.

SCHINER, J. R. Fauna Austriaca. Die Fliegen (*Diptera*), nach der analytischen Methode bearbeitet. Zweiter Theil. Vienna, 1864, pp. 658.

In the second part of his great work on the *Diptera* of Austria, published in 1864, Schiner commences with his second great section of the family *Muscidæ*, continues through the *Phoridae*, of which he makes a distinct family, to the numerous families of the great group *Nematocera*, Latr., and concludes the order with the Pupiparous families *Hippoboscidae* and *Nycteribidae*, which are thus placed at rather too great a distance from their unquestionable allies, the *Muscidæ* and *Æstridæ*. The whole of the European genera are characterized, as are all the species occurring in Germany, and under each genus is given a list of the European species not found in Germany. The whole work is arranged as a dichotomous table, with the detailed generic and specific descriptions interwoven, in the same manner as in Redtenbacher's well-known work on the Austrian Beetles; and there is also, at the commencement, a tabular synopsis of families, subfamilies, and genera, to facilitate reference to the body of the work. By these means the inconvenience experienced in consulting many treatises tabularly arranged is entirely removed. The species of *Diptera* described in this volume are arranged in the following families: *Muscidæ Acalypterae*, including 156 genera; *Phoridae*, with four genera; *Bibionidae*, with seven genera; *Simuliidae*, with the single genus *Simulia*; *Cecidomyiidae*, with fifteen genera; *Mycetophilidae*, with forty-five genera; *Rhyphidae*, with the single genus *Rhyphus*; *Tipulidae*, with thirty-nine genera; *Chironomidae*, with seven genera; *Culicidae*, with five genera; *Psychodidae*, with six genera; *Hippoboscidae*, with eight genera; and *Nycteribidae*, for *Nycteribia* alone. The genera *Blepharicera* (Macq.), *Macropeza* (Meig.), *Spodius* (Loew), *Pachyneura* (Zett.), *Corynocera* (Zett.), *Dixa* (Meig.), and *Orphnephila* (Hal.) are placed as "*genera incertæ sedis*" at the end of the Nematocerous families (pp. 637-643). The total number of Austrian species (including

those of the last-mentioned genera) is over 1380, 628 (or nearly half) belonging to the second division of the Muscidae.

SCHINER, J. R. *Catalogus systematicus Dipteriorum Europæ*. Vienna, 1864, pp. 125.

This catalogue contains, printed in three close columns on each page, the names of about 10,000 European species of Diptera, belonging to 677 genera. The classification adopted differs from that followed in the 'Fauna Austriaca' of the same author, the entire order being divided into two great sections, according as the pupæ split longitudinally (*Dipt. orthorhapha*), or the insect escapes by throwing off a circular lid (*Dipt. cyclo-rhapha*). (Cf. p. 535.) This catalogue is published by the Zoologisch-botanische Gesellschaft of Vienna.

B. Papers published in Journals.

BERGENSTAMM, JULIUS VON. Ueber die Metamorphose von *Discomyza incurva* (Fall.). Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 713-716.

BERTOLONI, GIUS. Poche notizie intorno all' insetto, che danneggia i seminati di grano lungo l'Emilia. Rendiconto dell' Accad. delle Scienze di Bologna, 1864, pp. 79-85, and Anche due parole intorno a' vermi che danneggiano i seminati di grano nel Bolognese nel 1864; *l. c.* pp. 140-144.

COHN, FERDINAND. Die gelbe Halmfliege (*Chlorops*), der Verwüster der Weizenfelder. Stettiner entom. Zeitung, 1864, pp. 413-417. (Reprint.)

ERCOLANI, G. B. Sulle larve dell' Estro o Gastro equino. Rendiconto dell' Accademia delle Scienze di Bologna, 1864, pp. 20-25 (read 26 November, 1863).

GERSTÄCKER, A. Uebersicht der in der Umgegend Berlins bis jetzt beobachteten Dolichopoden. Stett. ent. Zeitung, 1864, pp. 20-48.

GERSTÄCKER, A. Einige neue Dolichopoden aus dem Bayerischen Hochgebirge. Ibid. pp. 145-154.

GIGLIOLI, HENRY. On some parasitical Insects from China. Quart. Journ. Micr. Science, vol. iv. pp. 23-26. 1864.

GIRARD, MAURICE. Note sur des Diptères parasites du *Sericaria mori*. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 155-157. 8 June, 1864 (read 22 July, 1863).

HABERLANDT, FRIED. *Cecidomyia destructor* (Say), Weizengallmücke oder Weizenverwüster. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 401-406.

KREFFT, GERARD. Notes on the metamorphosis of a Dipterous Insect of the genus *Batrachomyia* (MacLeay), the larva of

which is parasitic upon various species of Australian frogs. Trans. Ent. Soc. of New South Wales, vol. i. pp. 100 & 101, pl. 8. Sydney, 1864 (read 3 August, 1863).

KÜNSTLER, G. A. Ueber Getreideverwüster. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 407-412.

LIQY, PAOLA. Sopra una straordinaria invasione di Ditteri, della famiglia degli Empiti. Atti della Società Italiana di Scienze Naturali, vol. vi. pp. 380-334. August 1864.

LIQY, PAOLO. I Ditteri distribuiti secondo un nuovo methodo di classificazione naturale. Atti dell' Istituto Veneto, 3^a ser. tomo ix. pp. 187-236, 499-518, 569-604, 719-773, 879-910, 989-1029, 1087-1126, 1311-1352, and tomo x. pp. 59-84.

In this long memoir Liqy has given a complete classification of the Diptera; but, although he describes it as being on a new method, his system is essentially founded on that of Macquart, with the introduction of some modifications or additions suggested by the works of Robineau-Desvoidy and others. The chief characteristic of Liqy's classification (which it shares, unfortunately, with too many modern systematic works) consists in the establishment of numerous subfamilies. A sketch of the classification will be given below. Many new genera are established by the author, a few new species are described, and the illustrated species cited compose a list of the Diptera of Northern Italy and of the neighbouring countries.

LOEW, H. Diptera Americæ septentrionalis indigena. Centuria quinta. Berl. entom. Zeitschrift, 1864, pp. 49-104.

LOEW, H. Zur Kenntniss der deutschen *Heteroneura*-Arten. Berliner entom. Zeitschr. 1864, pp. 334-346.

LOEW, H. Die Arten der Gattung *Balioptera*. Berliner entom. Zeitschr. 1864, pp. 347-356.

LOEW, H. Ueber die europäischen Arten der Gattung *Diastata*. Berliner entom. Zeitschr. 1864, pp. 357-368.

MIK, JOSEF. Dipterologische Beiträge. Mit einem Vorworte von Dr. J. R. Schiner. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 785-798, Tafel 21.

OSTEN-SACKEN, R. Description of several New North-American *Ctenophora*. Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 45-49. May 1864.

PULS, J. C. Catalog der Dipteren aus der Berliner Gegend, gesammelt von J. F. Ruthe. Berliner entom. Zeitschr. 1864, Appendix, pp. 14.

This catalogue contains the names of 1359 species of Diptera, collected by Ruthe in the neighbourhood of Berlin. They are arranged in accordance with the system adopted by Schiner in his 'Catalogue of European Diptera.'

- SCHINER, J. R. Ueber das Flügelgeäder der Dipteren. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 193-200, Tafel 3.
- SCHINER, J. R. Ein neues System der Dipteren. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 201-212.
- VAN DER WULP, F. M. Jets over de in Nederland Waargenomen *Sepsinen*. Tijdschrift voor Entom. vii. Deel, pp. 129-144, pl. 8. Haarlem, 1864.
- VAN DER WULP, F. M. Nieuwe Naamlijst van inlandsche Diptera. Bouwstoffen voor eene Fauna van Nederland, 3de Deel, pp. 147-187.
- VOLLENHOVEN, S. C. SNELLEN VAN. Description de quelques espèces nouvelles de Coléoptères. Tijdschrift voor Entom. vii. Deel, pp. 145-170, pls. 9-12. Haarlem, 1864.
- WALKER, FRANCIS. Catalogue of the Dipterous Insects collected in Waigiou, Mysol, and North Ceram, by A. R. Wallace, Esq., with descriptions of new species. Journ. Proc. Linn. Soc. vol. vii. pp. 202-238. April 5, 1864 (read February 5, 1863).

The number of species recorded from Mysol is 100, from Waigiou 40, from Ceram 42, and from Garrite 1.

- WALSH, B. D. On the Insects, Coleopterous, Hymenopterous, and Dipterous, inhabiting the galls of certain species of willow. Part 1st, Diptera. Proc. Entom. Soc. of Philad. vol. iii. pp. 543-644. December 1864.

In this elaborate paper Walsh proposes to do for the numerous galligenous insects of the North-American willows what he has already done for the Cynipideous gall-flies of the oaks of the same country. The first part is devoted exclusively to the Gall-gnats of the genus *Cecidomyia*. A notice of Walsh's general remarks on the phenomena presented by the life-history of these insects will be given on the completion of the memoir.

SCHINER (Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 193-200) proposes a new nomenclature for the veins of the wing in the Diptera. He indicates that in a few cases three, but in most instances only two, longitudinal veins spring from the base of the wing, and that these by their division give rise to the other longitudinal veins. The third of these veins, when present, is very small; for the others Schiner proposes the names of *upper* and *lower primary veins*. They are always united by a *transverse vein*, which is usually perpendicular to the long axis of the wing, but is sometimes oblique and curved, and then less easily distinguishable. The outer margin of the wing is occupied by the *costal vein*; the upper primary vein may be called the *subcostal*. From the subcostal vein springs the second, and from this the third

longitudinal vein, or the *radial* and *cubital veins*. When only a single inferior branch is emitted by the subcostal vein, this is to be regarded as the *cubital*. Between the subcostal and the costal there is another longitudinal vein, the *mediastinal*, which, however, is frequently amalgamated with the subcostal. The space at the base of the wing between the costal and mediastinal veins is considered by Schiner to be of great importance in the interpretation of the Dipterous wing; indeed he puts forward the hypothesis that it may represent the fore wings of insects of other orders. The further divisions of the radial and cubital veins, when such exist, do not require special names. For the second main stem Schiner proposes the name of *postical vein*; it emits a branch above and below; the upper branch is the *discoidal*, the lower the *anal vein*. These are the fourth, fifth, and sixth longitudinal veins of Schiner's former terminology. The discoidal vein has a remarkable tendency to divide, and by this means furnishes, in several of the more complicated wings, the chief part of the reticulation of the apical portion of the disc. The postical vein is frequently more or less branched; a superior branch often unites it with the discoidal vein, enclosing a space which may be called the *posterior basal cell*. This superior branch of the postical may be called the *posterior transverse vein*. The anal vein sometimes runs simply to the margin of the wing, sometimes unites again with the postical, enclosing an *anal cell*. The third primary vein, when present, is the *axillary vein*.

The cells are named from the veins enclosing them. The *mediastinal cell* is between the mediastinal and costal veins; the next cell, parallel to this, enclosed by the subcostal, is the *costal cell*; the *subcostal cell* is enclosed between the subcostal and radial veins; and the *cubital cell* between the cubital and radial (or, when the latter is absent, the subcostal) veins. The cell enclosed between the upper and lower primary veins and closed by the transverse vein is the *anterior basal cell*. The *discoidal cell* is situated on the disc of the wing below the transverse vein; it is enclosed by the discoidal and postical veins and their branches, or by the former alone. The *posterior marginal cells* occupy the posterior margin of the wing, and are bounded by the branches of the lower primary vein; but the first and most important of them is enclosed between the discoidal and cubital veins, the transverse vein, and the margin of the wing.

The Recorder has analyzed this paper of Schiner's at some length, as it seems to offer a terminology for the venation of the wings of Diptera far preferable to any that has preceded it. In its application, however, as far as we can judge from the excellent diagrammatic figures of wings given on Tafel 3, the author himself seems to be sometimes unsuccessful; the interpretation of the Stratiomyide wing (fig. 6) and the Phoride wing

(fig. 9) is evidently erroneous, the latter even having two distinct so-called discoidal veins springing from the cubital! The application of the term cubital vein to the branch of the subcostal when only one is present also seems to be an error; in the more complex wing the cubital is a branch of the radial, and the latter cannot well be supposed to be suppressed. The simplest course would be to regard the entire branch as forming a cubital vein enclosing one, two, or three cells, according to the extent to which the further ramification is carried. When the mediastinal vein is apparently deficient, Schiner regards it as united with the subcostal; but in his figures he represents the space between this combined vein as the costal cell. It is evident that if the mediastinal vein is really combined with the subcostal, this cell must be the mediastinal.

Starting from the principles laid down in the paper just referred to on the venation of the wing in the Diptera, Schiner proceeds in a second memoir to propose a new classification of this order (*loc. cit.* pp. 201-212). As his primary divisions he adopts the groups proposed by Brauer in his monograph of the *Æstridæ*, and divides the whole order into two primary sections, the *Diptera orthorhapha* and *D. cyclorhapha*. The latter group includes those forms in which the pupa is coarctate, and the perfect insect escapes by throwing off a sort of lid from one end of the dried larva-skin; in the former the pupa is sometimes coarctate, but in all cases the larva-skin is slit longitudinally in the dorsal portion to give exit to the pupa or perfect insect. The further classification of the families is founded upon the structure of the antennæ and proboscis and upon the character of the venation of the wings, as shown in the following Table:—

I. DIPTERA ORTHORHAPHA.

A. NEMATOCERA.

1. Oligoneura.

Fam.:—*Cecidomyidæ*. *Mycetophilidæ*. *Simulidæ*. *Bibionidæ*.

2. Polyneura.

Fam.:—*Chironomidæ*. *Psychodidæ*. *Culicidæ*. *Tipulidæ*. *Rhyphidæ*.

B. BRACHYCERA.

1. Cyclocera.

Fam.:—*Stratiomydæ*. *Xylophagidæ*. *Cenomyidæ*. *Tabanidæ*.

2. Orthocera.

Fam.:—*Nemestrinidæ*. *Bombylidæ*. *Acroceridæ*. *Scenopinidæ*. *Therevidæ*. *Midasidæ*. *Asilidæ*. *Leptidæ*. *Empidæ*. *Dolichopidæ*.

II. DIPTERA CYCLORHAPHA.

A. PROBOSCIDEA.

1. Hypocera.

Fam.:—*Phoridæ*.

2. Orthocera.

a. *Oligoneura*.

Fam.:—*Muscidæ acalypteræ*. *Muscidæ calypteræ*. *Cestridæ*.

b. *Folyneura*.

Fam.:—*Platypezidæ*. *Pipunculidæ*. *Syrphidæ*. *Conomidæ*.

B. EPROBOSCIDEA.

Fam.:—*Nycteribidæ*. *Hippoboscidæ*.

Incertæ sedis: *Lonchopteridæ*.

LIÖY, in his memoir on the classification of the Diptera (Atti Istituto Veneto, tomo ix.), divides the Order into two primary groups, which he names, following Latreille and other authors, Nemoceri and Brachoceri. His further classification is shown below:—

Division I.—Nemoceri.

Tribe I. Culicidi.

Tribe II. Tipularidi. Fam. 1. Culiciformiti. Subfam. Stanneicolini (*Corethra*, *Chironomus*, &c.), Lignicolini (*Ceratopogon*, &c.). Fam. 2. Rostratiti: Subf. Paludicolini (*Ptychoptera*), Lignicolini (*Ctenophora*, &c.), Terricolini (*Tipula*, &c.), Limocolini (*Limnobia*, *Erioptera*, *Trichocera*, &c.). Fam. 3. Fungicoliti (= *T. fungicolæ*, Lat.). Fam. 4. Gallicoliti (*Cecidomyia*, &c.). Fam. 5. Scathopsiti (*Psychoda*, *Simulium*, *Bibio*, *Scathopse*, &c.).

Division II. Brachoceri.

Subdivision 1. Geomyzi. (Liöy).

Tribe III. Tabanidi. Fam. 1. Hæmatophiliti (*Hæmatopota*, *Tabanus*, &c.). Fam. 2. Anthophiliti (*Pangonia*).

Tribe IV. Notacanthidi. Fam. 1. Xylophagiti (*Beris*, *Cænomyia*, &c.). Fam. 2. Stratiomyti: Subfam. Sordicolini (*Nemotelus*, *Sargus*, &c.), Lignicolini (*Ozycera*, &c.), Aquicolini (*Stratiomys*, &c.).

Tribe V. Tanystomidi. Section 1. Zoophagi. Fam. 1. Asiliti. Fam. 2. Empiti: Subf. Empidini, Tachydromini (*Hybos*, *Heimerodromia*, &c.). Section 2. Fitofagi. Fam. 1. Ocydromiti (*Ocydromia*, &c.). Fam. 2. Vesiculiti (*Cyrtus*, *Acrocera*, &c.). Fam. 3. Nemestriniti. Fam. 4. Bombyliti: Subf. Pachygastrini (*Bombylius*, &c.), Leptogastrini (*Toxophora*, *Phthiria*, &c.). Fam. 5. Anthraciti: Subf. Dolichostomini (*Mulio*), Microstomini (*Anthrax*, &c.). Fam. 6. Leptiti. Fam. 7. Thereviti (*Thereva*).

Subdivision 2. Abiomyzi (Liöy).

Tribe VI. Syrphidi. Fam. 1. Ceriti (*Ceria*, *Callicera*). Fam. 2. Psariti (*Psarus*, *Chrysotoxum*, &c.). Fam. 3. Eristaliti: Subf. Phytocolini (*Criorhina*, *Merodon*, &c.), Foveicolini (*Eristalis*, *Eriops*, &c.), Parassitini (*Vulcella*, &c.). Fam. 4. Milesiti (*Xylota*, *Eumerus*, *Milesia*, *Syrphus*, &c.). Fam. 5. Asciti (*Ascia*, *Sphegina*, &c.).

Tribe VII. Dolichopodidi. Fam. 1. Scenopiniti. Fam. 2. Hydrophoriti (*Rhaphium*, *Porphyrops*, &c.). Fam. 3. Lonchopteriti. Fam. 4. Platypeziti (*Platypeza*, *Callomyia*, &c.). Fam. 5. Medeteriti (*Diaphora*, *Medeterus*, *Dolichopus*, &c.).

Tribe VIII. Muscidi. Fam. 1. Phasianiti: Subf. Xistini, Hyalomyni (*Hy-*

alomysia, *Phasia*, &c.). Fam. 2. Dexiariti: Subf. Dexini, Omalogastrini (*Myostoma*, &c.). Fam. 3. Sarcophagiti. Fam. 4. Hæmatobiti (*Stomoxys*, &c.). Fam. 5. Polifagiti: Subf. Rostratini (*Rhynchomyia*), Metallicini (*Lucilia*, &c.), Ceruleini (*Calliphora*, &c.), Armentarini (*Musca*, &c.), Tomentosini (*Pollenia*, &c.), Vagantini (*Dasyphora*, *Muscina*, &c.).

Tribe IX. Anthomyzidi. Fam. 1. Musciformiti (*Yetodesia* [Rond.] = *Aricia* [Macq.]). Fam. 2. Hydrophoriti (*Hydrophoria*, *Hydrotæa*, &c.). Fam. 3. Anthomyiti: Subf. Hylemyini (*Ægeria*, *Drymeja*, &c.), Herbicolini (*Chcrotophila*, &c.), Chorellini (*Philinta*, &c.), Limosellini (*Cænusia*, &c.), Pegomyini (*Pegomyia*, &c.).

Tribe X. Acalypteridi. Fam. 1. Dolichoceriti (*Sepedon*, *Limnia*, *Tetanocera*, &c.). Fam. 2. Loxoceriti. Fam. 3. Cordyluriti. Fam. 4. Scatophagiti. Fam. 5. Psilomyti. Fam. 6. Ortaliti. Fam. 7. Tephrititi (*Trypeta*, &c.). Fam. 8. Sepiti. Fam. 9. Leptopoditi. Fam. 10. Uliditi. Fam. 11. Lauxaniti. Fam. 12. Hydromyziti. Fam. 13. Piophiliti. Fam. 14. Drosophiliti. Fam. 15. Sphæroceriti (*Borborus*, &c.). Fam. 16. Heteromyziti: Subf. Leptomyzini (*Leucopis*, &c.), Siphonellini (*Gymnopa*, &c.), Meromyzini (*Heteroneura*, *Meromyza*), Chloropsini (*Oscinis*, *Chlorops*, &c.), Agromyzini (*Agromyza*, &c.), Phytomyzini, Elachipterini.

Subdivision 3. Biomyzi (Lioy).

Tribe XI. Entomobidi. Fam. 1. Conopsiti (*Conops*, *Myopa*, &c.). Fam. 2. Entozoiti (= *Tachinaria*, Macq.): Subf. Siphonini (*Siphona*, *Aphria*, &c.). Tryptocerini (*Tryptocera*, &c.), Gonini (*Gonia*, *Gnephalia*), Micropalpini (*Micropalpus*, *Bonellia*), Echinomyini (*Echinomyia*, &c.), Nemoreini (*Trixa*, *Meriana*, &c.), Senometopini (*Senometopia*, &c.), Masicerini (*Masicera*, *Metopia*, *Phorocera*, &c.), Lydelleini (*Lydella*, *Athrycia*, &c.), Dachineini (*Chrysosoma*, *Tachina*, &c.), Miltogrammini, Clytini (*Clytiomyia*, &c.), Myobini (= *Myobia*, Macq.), Zophomyini (= *Zophomyia*, Macq.), Thelareini (*Sericocera*, &c.), Ptilocerini (*Ptilocheta*, *Sterenia*, &c.), Melanophorini (*Phoricheta*, *Melanophora*, &c.). Fam. 3. Ocypteriti (*Lophosia*, *Phunia*, *Ocyptera*, &c.). Fam. 4. Gymnosomiti (*Cistogaster*, &c.).

Tribe XII. Trineuridi. Fam. 1. Hypoceriti (*Phora*, *Trineura*, &c.). Fam. 2. Coniceriti (*Conicera*).

Tribe XIII. Ectridi. Fam. 1. Cavicoliti (*Cephenemyia*, *Cephalemyia*). Fam. 2. Cuticoliti (*Hypoderma*, *Ædemagena*). Fam. 3. Gastricoliti (*Æstrus* = *Gastrus*, Meig.).

Schiner (Verh. zool.-bot. Ges. in Wien, Band xiv. pp. 785-791) remarks, in introduction to Mik's "Dipterologische Beiträge," upon the extent of the known Dipterous fauna of Austria, and states that he believes the number of species may be doubled by further researches. He indicates the difficulties in the way of the detection of species of certain groups, and the means to be adopted for their removal.

Van der Wulp has completed his synonymic catalogue of the Diptera of Holland, which includes 1043 species. Bouwstoffen, &c. pp. 147-187.

Mik has published some notes on the preparatory states of various Diptera, Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 797 & 798. The species referred to are: *Helomyza atricornis* (Meig.), *Leria modesta* (Meig.), *Doros conopseus*

(Fab.), and *Cyrtoneura stabulans* (Fall.), the latter bred from shells of *Helix lefeburi* (Fer.).

The same author (l. c. p. 798) gives a list of rare and remarkable species of Diptera observed by him in the neighbourhood of Görz.

A translation of Loew's paper "On the Dipterous fauna of Amber" is given in the American Journal of Science for May 1864 (vol. xxxvii. pp. 305-324). Notes have been appended to it by the author, containing lists of species in illustration and confirmation of the statements made in the original text.

CECIDOMYIDÆ.

Walsh, in his memoir on the Cecidomyidan galls of the North-American willows (Proc. Ent. Soc. Phil. vol. iii. pp. 543-644), describes 15 specific forms of these excrescences, the producers of six of which are known to him in the perfect state. The galls of the larvæ, pupæ, and perfect insects (where these are known) are fully described by the author, who also describes eight species of inquiline Gall-gnats of the genus *Cecidomyia*.

Haberlandt (Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 401-406) describes the occurrence of *Cecidomyia destructor* (Say) in injurious abundance in various parts of the Austrian dominions, and gives an account of the life-history of the fly.

The ravages of the same insect form the subject of a paper by Künstler (l. c. pp. 407-412), who also refers to some other species. Frauenfeld also notices the *Cecidomyia*, with other Dipterous insects injurious to vegetation (l. c. pp. 413-416).

Bertoloni notices the destruction of grain by *Cecidomyia cerealis*. Rendic. Accad. Sci. Bologna, 1864, pp. 79-85, and p. 140-144.

Cecidomyia. Of this genus Walsh (Proc. Ent. Soc. Phil. vol. iii.) describes the following species as producing galls on various N.-American willows: *C. salicis brassicoides*, l. c. p. 579; *C. s. strobiloides*, l. c. p. 582; *C. s. gnaphalioides*, l. c. p. 585; *C. s. rhodoides*, l. c. p. 587; *C. s. siliqua* (= *C. salicis*, Fitch? = *C. rigidæ*, O. S.?), l. c. p. 594; *C. s. batatas*, l. c. p. 604. Also the following inquiline species:—*C. albovittata*, l. c. p. 621; *C. orbitalis*, l. c. p. 623; *C. cornuta*, l. c. p. 625; (Subgenus DIPLOPSIS) *D. atrocularis*, l. c. p. 626; *D. atricornis*, l. c. p. 628; *D. annulipes*, l. c. p. 629; *D. septem-maculata*, l. c. p. 630; *D. decem-maculata*, l. c. p. 631.

Cylindrocera, g. n., Liroy, Atti Ist. Ven. 3^a ser. tomo ix. p. 503. Allied to *Cecidomyia*; antennæ cylindrical, of 12 joints. Sp. *C. ribesii* (Meg.).

MYCETOPHILIDÆ.

Laboulbène describes *Sciara ingenua* (L. Duf.) as a tuberivorous insect. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 89.

Genja, Liroy, Atti Ist. Ven. 3^a ser. tomo ix. p. 229. Liroy proposes this name for *Macrocera* (Meig.), the latter name having been applied by Spinola to a genus of Hymenoptera. The new name is in honour of Professor Gené.

Macrocera annulicora, sp. n., Mik, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 791, near Vienna.

Leia indivisa, sp. n., Walk. Proc. Linn. Soc. vol. vii. p. 223, from Waigiou.

Sciara ponderosa, sp. n., Walk. l. c. p. 230, from Ceram.

BIBIONIDÆ.

Bibio. Loew (Berl. entom. Zeitschr. 1864) describes the following new species from North America: *Bibio hirtus*, l. c. p. 51, from California; *B. inæqualis*, ibid., from Sitka; *B. nervosus*, l. c. p. 52, from California; *B. obscurus*, ibid., from the Hudson's Bay Territory; *B. lugens*, ibid., from Lake Winnipeg; *B. variabilis*, l. c. p. 53, from Sitka and New Hampshire; *B. fraternus*, l. c. p. 54, from Columbia; *B. abbreviatus*, ibid., from Columbia; *B. nigripilus*, l. c. p. 55, from Lake Winnipeg; *B. basalis*, ibid., from New Hampshire; and *B. longipes*, ibid., from Columbia.

Scatopse pygmaea, Loew, l. c. p. 56, from Columbia.

CHIRONOMIDÆ.

Chasmatonotus unimaculatus, sp. n., Loew, Berl. entom. Zeits. 1864, p. 50, from New Hampshire.

CULICIDÆ.

Culix glaphyropterus, sp. n., Schiner, Fauna Austr. p. 628, Austria.

TIPULIDÆ.

Osten-Sacken states that of the five species of *Ctenophora* recorded in his Catalogue, two, namely *C. fuliginosa* (Say) and *C. abdominalis* (Say), belong to *Tipula*, and that *C. parrii* (Kirby) is also probably a *Tipula*. The others, *C. dorsalis* (Walk.) and *C. succedens* (Walk.), the author has been unable to identify. Proc. Ent. Soc. Phil. vol. iii. p. 45.

New genera :—

Anomaloptera, Lioy, Atti Ist. Ven. 3^a ser. tomo ix. p. 218. Allied to *Pachyrrhina*; prolongation of the head rather long and narrow; forehead flat; first joint of antennæ elongate. Type *Tipula nigra* (Linn.).

Macroptera, Lioy, l. c. p. 224. Allied to *Cylindrotoma*; wings very broad, especially in ♀, two submarginal and four posterior cells. Sp. *Macroptera quadrivittata* (Lioy) = *Cylindrotoma macroptera* (Macq.).

Plutytoma, Lioy, l. c. p. 226. Allied to *Erioptera*; second joint of antennæ much elongated and thick; wings with a discoidal cell. Type *Erioptera cinerascens* (Meig.).

New species :—

Ctenophora. Osten-Sacken (Proc. Ent. Soc. Phil. vol. iii.) describes five new North American species of this genus: namely, *C. nubecula*, l. c. p. 45, from Illinois; *C. apicata*, l. c. p. 46, from Maine and New Hampshire; *C. fumipennis*, l. c. p. 47, from Virginia; *C. topazina*, ibid., from Virginia; and *C. frontalis*, l. c. p. 48, from Massachusetts and Ohio, perhaps = *C. succedens* (Walk.).

Pachyrrhina. The following North American species are described by Loew (Berl. ent. Zeits. 1864): *Pachyrrhina nobilis*, l. c. p. 62, and *P. lugens*, l. c. p. 63, from New Hampshire; *P. virescens*, l. c. p. 62, from Columbia; *P. vittula*, l. c. p. 63, and *P. occipitalis*, l. c. p. 65, from the Hudson's Bay Territory; *P. sodalis*, l. c. p. 64, from Connecticut; *P. xanthostigma*, l. c. p. 65, from Illinois; *P. unimaculata*, l. c. p. 64, from New York; and *P. gracilictrnis*, l. c. p. 66 (origin not mentioned).

Tipula. Loew (Berl. ent. Zeits. 1864) describes the following new species of this genus: *Tipula fraterna*, l. c. p. 56, from Columbia; *T. ternaria*, l. c. p. 57, *T. macrolabis*, l. c. p. 58, *T. serrulata*, ibid., *T. canadensis*, l. c. p. 59, and *T. centralis*, l. c. p. 60, from the Hudson's Bay Territory; *T. pubera*, l. c. p. 57, from California; *T. latipennis*, l. c. p. 60, and *T. tephrocephala*, l. c. p. 62, from New Hampshire; and *T. angulata*, l. c. p. 61, from Massachusetts and New Hampshire.

Geranomysia maculipennis, Mik, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 791, pl. 21. figs. 1 & 2, from Görz.

Linnobia aurorata, Walk. Proc. Linn. Soc. vol. vii. p. 202, and *L. selectissima*, Walk. ibid., from Mysol; *L. delectata*, Walk. l. c. p. 231, and *L. innotabilis*, Walk. ibid., from Ceram; *L. goritiensis*, Mik, l. c. p. 792, from Görz.

Rhiphidia uniseriata (Schummel, MS.), Schiner, Fauna Austr. p. 564, from Silesia.

Gymnoplusia melancholica, Walk. l. c. p. 203, from Mysol.

STRATIOMYDÆ.

Aulana, g. n., Walker, Proc. Linn. Soc. vol. vii. p. 204. Allied to *Clitelaria*; body broad; head wider than front of thorax; antennæ subsetaceous, acute, long, joints indistinct; thorax produced and narrowed in front; scutellum large, conical. Sp. *A. confirmata*, sp. n., Walk. l. c. p. 204, from Mysol.

Musama, g. n., Walker, l. c. p. 205. Body short, broad; antennæ short, subfusiform, compact, arista long; thorax convex; scutellum bispinose. Sp. *M. paupera*, sp. n., Walk. l. c. p. 205, from Mysol.

Stratiomys restricta, sp. n., Walker, l. c. p. 203, from Mysol.

Salduba gradens, sp. n., Walk. ibid., and *S. areolaris*, sp. n., Walk. l. c. p. 204, from Mysol.

Pachygaster alpinus, sp. n., Liroy, Atti Ist. Ven. 3^a ser. tomo ix. p. 588, from the subalpine woods of Vicenza.

XYLOPHAGIDÆ.

Hexacantha, g. n., Liroy, Atti Ist. Ven. 3^a ser. tomo ix. p. 586. Allied to *Eeris*; antennæ usually not much elongated; first joint of posterior tarsi oblong; scutellum with six spines. Sp. *H. chalybeata* (Forst.), *clavipes* (Meig.), *vallata* (Forst.), and *nigritarsis* (Lat.).

Octacantha, g. n., Liroy, l. c. p. 586. Allied to *Beris*; antennæ longer than the head; scutellum with eight spines. Sp. *O. fuscipes* (Meig.), *flavipes* (Macq.).

TABANIDÆ.

Tabanus exagens, sp. n., Walker, Proc. Linn. Soc. vol. vii. p. 205, *T. facilis*, sp. n., Walk. l. c. p. 206, *T. sylvioides*, sp. n., Walk. ibid., from Mysol; and *T. obscuratus*, sp. n., Walk. l. c. p. 232, from Ceram.

BOMBYLIIDÆ.

Frauenfeld has bred specimens of *Argyramæba leucogaster* (Meig.) from larvæ found in the nests of *Cemonus*, and suggests that the larvæ of the Anthracide parasites are probably carried by the bees into their nests in the same way as those of *Meloe* and the Strepsiptera. Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 688 & 689.

Villa, g. n., Lioy, Atti Ist. Ven. 3^a ser. tomo ix. p. 732. Allied to *Anthrax*; epistoma not advanced; arista without a tuft of hairs; wings transparent, fringed with blackish hairs at the base. Sp. *Anthrax cana* (Meig.), &c.

Defillipia, g. n., Lioy, l. c. p. 733. Allied to *Anthrax*; epistoma advanced; wings fuscous, thickly punctate, with three submarginal cells. Sp. *Anthrax megerlei* (Meig.), &c.

Bombylius antenoreus, sp. n., Lioy, Atti Ist. Ven. 3^a sér. tomo ix. p. 728. Like *B. major*, but with the hairs of the body yellow and black; wings of a bluish black colour. Length 5 lines. From Padua.

Anthrax emissa, sp. n., Walker, Proc. Linn. Soc. vol. vii. p. 233, from Ceram.

SCENOPINIDÆ.

Scenopinus fenestralis (Linn.). Frauenfeld (Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 65-68) describes the metamorphoses of this species, the larva of which lives, according to Assmuss, in rotten strawberries, and, according to Bouché, in rotten fungi, whilst the larvæ from which Frauenfeld's specimens were reared were living in dry horse-hair. Frauenfeld thinks that there may be some error in the former observations, especially in those of Assmuss. Loew found three larvæ in a swallow's nest, which he regards as belonging to a species of *Thereva*; Frauenfeld is inclined to refer them to *Scenopinus*.

Astoma, g. n., Lioy, Atti Ist. Ven. 3^a sér. tomo ix. p. 762. Allied to *Scenopinus*; proboscis not projecting; forehead rather broad; antennæ inserted near lower part of head, third joint subulate; posterior tibiæ spatulate. Sp. *A. niger* (Deg.).

ASILIDÆ.

New species :—

Cyrtopogon meyer-diirii, Mik, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 794, taf. 21. fig. 3, from the Engadine.

Asilus helveticus, Mik, l. c. p. 795, from the Engadine.

Asilus (*Gonypes*) *antenoreus*, Lioy, Atti Ist. Ven. 3^a ser. tomo ix. p. 598. Head yellowish, with vertex and eyes greenish; second and third joints of antennæ yellow; arista black; thorax black, with a ferruginous line on each side; abdomen greyish, punctured with black; legs yellow, anterior tarsi whitish at base. Length $5\frac{1}{2}$ lines. From Padua and the Euganean hills.

Asilus depulsus, Walk. Proc. Linn. Soc. vol. vii. p. 207, and *A. didymoides*, Walk. p. 208, from Mysol; *A. biligatus*, Walk. p. 224, from Waigiou.

Trupanea transacta, Walk. l. c. p. 207, from Mysol.

Ommatius invehens, Walk. l. c. p. 224, from Waigiou; and *O. bacchoides*, Walk. l. c. p. 232, from Ceram.

Laphria divrsa, Walk. l. c. p. 206, from Mysol; *L. auribasis*, Walk. l. c. p. 223, from Waigiou.

LEPTIDÆ.

Chrysopila stylata, sp. n., Walk. Proc. Linn. Soc. vol. vii. p. 208, from Mysol.

EMPIDÆ.

Loew states (Berl. entom. Zeitsch. 1864, p. 99) that his *Empis picta* is identical with *E. spiloptera* (Wiedem.).

Pachypeza, g. n., Liroy, Atti Ist. Ven. 3^a ser. tomo ix. p. 723. Allied to *Cyrtoma*; first joint of post. tarsi elongate, thick, the rest slender; wings with an oblique transverse vein near the base and three posterior cells. Type *Cyrtoma pallipes* (Meig.).

New species :—

Empis. Loew has described four new species of this genus from North America (Berl. entom. Zeits. 1864): namely, *Empis lævigata*, l. c. p. 75, *E. stenoptera*, ibid., and *E. rufescens*, l. c. p. 76, from New Hampshire; and *E. longipes*, ibid., from New York.

Empis salicina, Liroy, Atti Soc. Ital. Sci. Nat. vol. vi. p. 380. Liroy notices its occurrence at Vancimuglio, in the Vincentino, in immense numbers.

Hilara tristis, Loew, l. c. p. 82, *H. seriata*, Loew, ibid., and *H. testacea*, Loew, ibid., from New Hampshire.

Hormopeza brevicornis, Loew, l. c. p. 83, and *H. nigricans*, Loew, ibid., from Yukon River.

Rhamphomyia. Nine new species of this genus from New Hampshire are described by Loew (Berl. entom. Zeitschr. 1864): namely, *Rhamphomyia umbrosa*, l. c. p. 77; *R. basalis*, ibid.; *R. macilenta*, l. c. p. 78; *R. rustica*, l. c. p. 79; *R. luteiventris*, ibid.; *R. nigricans*, l. c. p. 80; *R. hirtipes*, ibid.; *R. irregularis*, l. c. p. 81; and *R. candicans*, ibid.

Gloma obscura, Loew, l. c. p. 84, and *G. rufa*, Loew, ibid., from New Hampshire.

Cyrtoma femorata, Loew, l. c. p. 84, from New Hampshire, and *C. procera*, Loew, l. c. p. 85, from Sitka.

Tachypeza. Loew (Berl. entom. Zeitschr. 1864) describes four new North American species of this genus: namely, *Tachypeza rapax*, l. c. p. 85, *T. clavipes*, l. c. p. 86, and *T. pusilla*, l. c. p. 87, from Illinois; and *T. rostrata*, l. c. p. 86, from New Hampshire.

Platypalpus. Of this genus Loew describes seven new species from N. America (Berl. entom. Zeitschr. 1864): *Platypalpus æqualis*, l. c. p. 88, from Illinois; *P. trivialis*, ibid., from Maine and Columbia; *P. pachynemus*, l. c. p. 89, from Columbia; *P. lateralis*, ibid., *P. flavirostris*, l. c. p. 90, and *P. letus*, l. c. p. 91, from New Hampshire; and *P. apicalis*, l. c. p. 90, from Pennsylvania.

DOLICHOPODIDÆ.

LOEW (Mon. N. Amer. Dolich. pp. 11-13) gives the following tabular arrangement of the genera of this family :—

I. First antennal joint hairy above.

A. Hypopygium disengaged.

* First joint of hind tarsi bristly.

a. Face descending as far as the anterior angle of the eye.

1. HYGROCELEUTHUS.

β. Face not descending as far as the anterior angle of the eye.

2. DOLICHOPUS.

† First joint of hind tarsi not bristly.

a. Palpi of ♂ unusually large 12. DIOSTRACUS.

β. Palpi of ♂ small.

1. Last portion of 4th longitudinal vein parallel, or nearly so, to 3rd longitudinal vein 3. GYMNOPTERNUS.
 2. Last portion of 4th longitudinal vein distinctly convergent towards 3rd longitudinal vein.
 - a. End of 4th longitudinal vein abruptly or steeply deflected anteriorly.
 - a. Arista with the usual pubescence; end of 4th longitudinal vein curved 4. PARACLIUS, g. n.
 - b. Arista shortly plumose; end of 4th longitudinal vein straight 5. PELASTONEURUS.
 - b. End of 4th longitudinal vein gradually deflected anteriorly.
 - a. Face reaching down to inferior corner of eye.
 6. TACHYTRECHUS.
 - b. Face not reaching inferior corner of eye.
 - Proboscis and palpi very much prolonged.
 7. ORTHOCHILE.
 - = Proboscis and palpi not prolonged.
 - ** Scutellum hairy 8. SYBISTROMA.
 - †† Scutellum not hairy.
 - aa. Hypopygium sessile 9. HERCOSTOMUS.
 - ββ. Hypopygium pedunculated.
 - Second antennal joint of usual shape.
 10. HYPOPHYLLUS.
 - Second antennal joint rudimentary.
 11. HALTERICERUS.
 - B. Hypopygium more or less imbedded.
 - * Abdomen of ♂ laterally compressed 13. ANEPSIUS.
 - † Abdomen of ♂ not compressed.
 - a. Second antennal joint of the usual shape.
 14. ARGYRA.
 - β. Second antennal joint with a thumb-like projection over the inside of the third 15. SYNTORMON.
- II. First antennal joint glabrous above.
- A. Third antennal joint (at least in ♂) prolonged, pointed, with an apical arista.
 - * Second antennal joint with a thumb-like projection over the inner side of the third 16. SYNARTHURUS.
 - † Second antennal joint simple.
 - a. Posterior transverse vein approximated to margin of wing; palpi hanging down 22. APHROSYLUS.
 - β. Posterior transverse vein distant from margin; palpi incumbent.
 1. Hypopygium pedunculated, free 17. SYSTEMUS.
 2. Hypopygium sessile, imbedded.
 - a. Abdomen in ♂ with 5 segments 21. SMILIOTUS (= *Machærium*, Hal.).
 - b. Abdomen in ♂ with 6 segments.

- a. Third antennal joint prolonged in ♀.
 - 18. RHAPHIUM.
- b. Third antennal joint not prolonged in ♀.
 - Third antennal joint of ♂ very much prolonged.
 - 19. XIPHANDRIUM.
 - = Third antennal joint of ♂ moderately prolonged.
 - 20. PORPHYROPS.
- B. Third antennal joint short, or if prolonged not pointed, arista subapical.
 - * Fourth longitudinal vein forked 43. PSILOPUS.
 - † Fourth longitudinal vein simple.
 - a. Upper side of thorax convex behind.
 - 1. Fifth longitudinal vein wanting 38. ACHALCUS.
 - 2. Fifth longitudinal vein distinct.
 - a. Distance of posterior transverse vein from margin at least equal to its own length.
 - a. Posterior transverse vein unusually oblique.
 - 34. PLAGIONEURUS.
 - b. Posterior transverse vein but little oblique.
 - Hypopygium distinctly bent under the venter.
 - ** Face very broad, not narrowed above.
 - 23. THINOPHILUS.
 - †† Face rather narrow, somewhat narrowed above.
 - 24. PEODES.
 - = Hypopygium not distinctly bent under the venter, or entirely imbedded.
 - ** Outer appendages of hypopygium long, filiform.
 - 25. NEMATOPROCTUS.
 - †† Outer appendages of hypopygium not long or filiform.
 - aa. Third antennal joint large in ♂.
 - 26. LEUCOSTOLA.
 - ββ. Third antennal joint small in ♂.
 - i. Pulvilli of fore tarsi in ♂ much enlarged, prolonged 28. DIAPHORUS.
 - ii. Pulvilli of fore tarsi in ♂ much enlarged, not prolonged 27. EUTARSUS.
 - iii. Pulvilli of fore tarsi in ♂ only slightly enlarged.
 - Arista apical or nearly apical; wings large.
 - 29. LYRONEURUS.
 - Arista apical or nearly apical; wings small.
 - 30. CHRYSOTUS.
 - Arista dorsal; feet of ♂ with isolated spine-like bristles 31. TEUCHOPHORUS.
 - Arista dorsal; feet without isolated spine-like bristles.
 - Face not narrowed above.
 - 32. SYMPYCNUM.
 - Face narrowed above. 33. CAMPSICNEMUS.

- b. Distance of posterior transverse vein from margin less than its own length.
 - a. Femora slender; abdominal segments with bristles before the hind margin..... 35. LIANCALUS.
 - β. Fore femora thickened towards base.
 - Fore tibiæ with long spines. . 36. SCELLUS.
 - = Fore tibiæ with very short spines.
 - 37. HYDROPHORUS.
- β. Upper side of thorax with a somewhat concave depression behind.
 - 1. Arista apical or subapical.
 - a. Third and fourth longitudinal veins strongly convergent.
 - 39. MEDETERUS.
 - b. Third and fourth longitudinal veins parallel.
 - 40. CHRYSOTIMUS.
 - 2. Arista dorsal.
 - a. Abdomen in ♂ with 6 segments. . 41. XANTHOCHLORUS.
 - b. Abdomen in ♂ with 5 segments. . 42. SAUCROPUS.

Rhagoneurus (*Rhageneura*, Rond.). Loew (Mon. N. Am. Dol. p. 346) characterizes this genus as follows:—First joint of antennæ with bristles on the upper side; arista feathered or hairy; first joint of hind tarsi with a bristle; fourth longitudinal vein twice broken at right angles, with a considerable stump of a vein at each angle of the fracture; abdomen of ♂ a little compressed; hypopygium entirely disengaged. Most nearly allied to *Dolichopus*. Sp. *Rhagoneurus* (*Dol.*) *ziczac* (Wied.).

Gerstäcker has published a list of the species of *Dolichopodidæ* found in the vicinity of Berlin. Stett. ent. Zeit. 1864, pp. 20–48. The list includes 104 species, many of which are described as new; one of them forms the type of a new genus.

Gerstäcker, in describing several new species of this family from the Bavarian Alps (Stett. ent. Zeit. 1864, pp. 145–154), also notices the previously described species met with by him in that district.

New genera :—

Paraclius, Loew, Mon. N. Amer. Dolich. p. 97 (see table). Known species *Paraclius* (*Pelastoneurus*) *arcuatus* (Loew).

Thrypticus. Gerstäcker, Stett. ent. Zeit. 1864, p. 43. Nearly allied to *Chrysotus*; antennæ very short, last joint rounded, arista very long; legs stout, quite destitute of bristles; no anal vein; male with three copulatory appendages, the lower one boat-shaped, the other two foliaceous. Sp. *T. maragdinus*, Gerst.

Notes on known species :—

The following known species of this family are figured by Loew (Mon. N. Amer. Dolichop.): *Hygroceleuthus latipes* (Loew), pl. 3. fig. 1; *Dolichopus funditor* (Loew), pl. 3. fig. 2; *Gymnopternus lunifer* (Loew), pl. 3. fig. 4; *Pelastoneurus vagans* (Loew), pl. 3. fig. 5; *Tachytrechus vorax* (Loew), pl. 3. fig. 6; *Orthochile soccata* (Loew), pl. 3. fig. 8; *Sybistromu nodicran* (Loew), pl. 4. fig. 10; *Hypophyllus discipes* (Ahr.), pl. 4. fig. 11; *Haltericerus eucerus* 1864. [VOL. I.] 2 N

(Loew), pl. 4. fig. 12; *Diostracus prasinus* (Loew), pl. 4. fig. 13; *Anepsius flaviventris* (Meig.), pl. 4. fig. 14; *Argyra albicans* (Loew), pl. 4. fig. 15; *Syntormon metathesis* (Loew), pl. 4. fig. 16; *Systemus scholtzii* (Loew), pl. 4. fig. 18; *Rhaphium longicorne* (Meig.), pl. 5. fig. 19; *Xiphandrium quadri-flatum* (Loew), pl. 5. fig. 20; *Porphyrops melampus* (Loew), pl. 5. fig. 21; *Smiliotus maritimæ* (Hal.), pl. 5. fig. 22; *Aphrosylus raptor* (Walk.), pl. 5. fig. 23; *Thinophilus flavipalpis* (Zett.), pl. 5. fig. 24; *Peodes forcipatus* (Loew), pl. 5. fig. 25; *Nematoproctus distendens* (Meig.), pl. 5. fig. 26; *Leucostola cingulata* (Loew), pl. 5. fig. 27; *Eutarsus aulicus* (Meig.), pl. 6. fig. 28; *Diaphorus spectabilis* (Loew), pl. 6. fig. 29; *Lyroneurus cærulescens* (Loew), pl. 6. fig. 30; *Chrysotus obliquus* (Loew), pl. 6. fig. 31; *Teuchophorus monacanthus* (Loew), pl. 6. fig. 32; *Sympycnus nodatus* (Loew), pl. 6. fig. 34; *Liancalus genualis* (Loew), pl. 6. fig. 35; *Plagioneurus univittatus* (Loew), pl. 6. fig. 36; *Medeterus diadema* (Linn.), pl. 7. fig. 39; *Achalcus flavicollis* (Meig.), pl. 7. fig. 40; *Xanthochlorus helvinus* (Loew), pl. 7. fig. 41; *Chrysotinus pusio* (Loew), pl. 7. fig. 42; *Saucropus dimidiatus* (Loew), pl. 7. fig. 43; and *Psilopus filipes* (Loew), pl. 7. fig. 44. The plates also contain figures of details of some other species of various genera.

New species :—

Dolichopus. Loew (Berl. entom. Zeitsch. 1864) describes the following new species of this genus :—*Dolichopus splendidulus*, l. c. p. 91, and Mon. N. Amer. Dol. p. 327; *D. palestricus*, l. c. p. 92, and Mon. N. Amer. Dol. p. 328; and *D. dorycerus*, l. c. p. 93, and Mon. N. Amer. Dol. p. 326, from New Hampshire; *D. quadrilumellatus*, l. c. p. 92, and Mon. N. Amer. Dol. p. 331, from New York; *D. melanocerus*, l. c. p. 93, and Mon. N. Amer. Dol. p. 330, from Canada.

The following new North American species are also described by Loew, Mon. N. Amer. Dol.: *Dolichopus xanthocnemus*, l. c. p. 31; *D. tetricus*, l. c. p. 33; *D. nudus*, l. c. p. 41; *D. subciliatus*, l. c. p. 42; *D. hastatus*, l. c. p. 59; *D. sezarticulatus*, l. c. p. 62; and *D. scoparius*, l. c. p. 70.

Dolichopus fallaciosus, Gerst. Stett. ent. Zeit. p. 21, and *D. eurypterus*, Gerst. l. c. p. 23, from the neighbourhood of Berlin.—*Dolichopus pulchriceps*, Walker, Proc. Linn. Soc. vol. vii. p. 210, from Mysol.

Rhagoneurus polychromus, Loew, Mon. N. Amer. Dol. p. 346, pl. 3. fig. 3, from Ceylon.

Gymnopternus. Loew describes the following new North American species of this genus, Mon. N. Amer. Dol.: *Gymnopternus tristis*, l. c. p. 83; *G. pusillus*, l. c. p. 334; *G. chalcocrus*, l. c. p. 335; *G. humilis*, l. c. p. 336; and *G. exiguus*, l. g. p. 337.

Gymnopternus coxalis, Loew, Berl. ent. Zeits. 1864, p. 94, and Monogr. North Amer. Dol. p. 335, from New York; and *G. meniscus*, Loew, *ibid.*, and Mon. N. Amer. Dol. p. 336, from Columbia; *G. grallator*, Gerstäcker, l. c. p. 26, from Berlin; *G. dysopes*, Gerstäcker, l. c. p. 152, from the Bavarian Alps.

Piracilius (g. n.) *albonotatus*, Loew, Mon. N. Amer. Dol. p. 102, pl. 3. fig. 7, from New Orleans.

Pelastoneurus abbreviatus, Loew, Berl. ent. Zeits. 1864, p. 94, and Mon. N. Amer. Dol. p. 338, *P. lamellatus*, Loew, l. c. p. 95, and Mon. N. Amer. Dol.

p. 338, and *P. alternans*, Loew, *ibid.*, and Mon. N. Amer. Dol. p. 339, from New York.

Tachytrechus melaleucus, Gerstäcker, *l. c.* p. 29, from Berlin; *T. kowarzii*, Mik, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 795, Taf. 21. fig. 5, from Hungary.

Hercostomus unicolor, Loew, Mon. N. Amer. Dol. p. 117, pl. 3. fig. 9, from the Hudson's Bay territory.

Argyra. Of this genus the following new North American species are described by Loew, Mon. N. Amer. Dol.: *Argyra nigripes*, *l. c.* p. 127; *A. albiventris*, *l. c.* p. 128; and *A. cylindrica*, *l. c.* p. 132.

Argyra aristata, Gerstäcker, *l. c.* p. 31, from Berlin; *A. incompta*, Gerstäcker, *l. c.* p. 145, from the Bavarian Alps.

Synarthrus palmaris, Loew, *l. c.* p. 135, pl. 4. fig. 17, from Sitka.

Xiphandrium sagax, Gerstäcker, *l. c.* p. 146, from the Bavarian Alps.

Porphypops longipes, Loew, Berl. ent. Zeits. 1864, p. 95, and Mon. N. Amer. Dol. p. 340, from New Hampshire.

Eutarsus eques, Loew, Mon. N. Amer. Dol. p. 154, from Venezuela.

Diaphorus lamellatus, Loew, *l. c.* p. 165, from the Middle States.

Chrysotus. Four new North American species are described by Loew, Mon. N. Amer. Dol.: *Chrysotus cornutus*, *l. c.* p. 179; *C. vividus*, *l. c.* p. 178; *C. subcostatus*, *l. c.* p. 181; and *C. picticornis*, *l. c.* p. 184.

Thrypticus (g. n.) *smaragdinus*, Gerstäcker, *l. c.* p. 44, from Berlin.

Sympycnus tertianus, Loew, *l. c.* p. 187, from Sitka.—*Sympycnus plantaris*, Gerstäcker, *l. c.* p. 148, and *S. spiculatus*, Gerst. *l. c.* p. 150, from the Bavarian Alps.

Campsicnemus claudicans, Loew, Mon. N. Amer. Dol. p. 194, pl. 6. fig. 33, from Sitka.

Scellus avidus, Loew, Mon. N. Amer. Dol. p. 207, pl. 7. fig. 37, and *S. filiferus*, Loew, *l. c.* p. 209, from the Hudson's Bay Territory.—*Scellus dolicho-cerus*, Gerstäcker, *l. c.* p. 46, from Eland.

Hydrophorus innotatus, Loew, Mon. N. Amer. Dol. p. 212, pl. 7. fig. 38, from Sitka.—*Hydrophorus rufibarbis*, Gerstäcker, *l. c.* p. 37, from Berlin.

Saucropus tenuis, Loew, *l. c.* p. 228, from the United States.

Psilopus subrectus, Walker, Proc. Linn. Soc. vol. vii. p. 209, and *P. moderatus*, Walk. *ibid.*, from Mysol; *P. seticornis*, Walk. *l. c.* p. 234, from Ceram.

PHORIDÆ.

Phora pallipes is described among tuberivorous Diptera by Laboulbène, Ann. Soc. Ent. Fr. 4^e série, tome iv. p. 88.

Phora bergenstammii, sp. n., Mik, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 793. Near Vienna, in putrid snails.

New genera:—

Trisometopia (sic), Lioy, Atti Ist. Ven. 3^a ser. tom. x. p. 77. Allied to *Phora*; forehead with a transverse line of bristles directed forwards; palpi broad; legs setulose; wings with the outer margin shortly ciliated. Sp. *Phora thoracica* (Lat.).

Obelosia, Lioy, l. c. p. 77. Allied to preceding; forehead with bristles directed downwards; posterior tibiæ with small spines; intermediate naked, terminated by a long spine. Sp. *Phora rufipennis* (Macq.).

Aneurina, Lioy, l. c. p. 77. Allied to preceding; face often with an impressed line; legs setulose, posterior tibiæ usually very spinose; wings slightly ciliated on the margin, anal vein wanting. Sp. *Phora urbana* (Meig.) and *P. opaca* (Meig.).

Diploneura, Lioy, l. c. p. 77. Allied to preceding; palpi usually broad; legs setulose, tibiæ often nearly naked; wings with a strongly ciliated margin, submarginal vein arcuate both at base and extremity. Sp. *Phora nitidula* (Meig.), &c.

Nemosia, Lioy, l. c. p. 78. Allied to preceding; vertex with a transverse tubercle; anterior tibiæ with two or four lateral bristles, intermediate not ciliated, posterior with one lateral bristle; wings ciliated; marginal vein simple, produced beyond the middle of the wing. Sp. *Phora incrassata* (Meig.).

Hypocera, Lioy, l. c. p. 78. Allied to preceding; legs setulose; wings ciliated, often projecting at base, marginal vein simple. Sp. *Phora mordellaria* (Meig.), &c.

Gymnoptera, Lioy, l. c. p. 79. Allied to preceding; forehead and legs setulose; wings not ciliated; marginal vein simple, not quite reaching the middle of the wing, distant from the mediastinal at its extremity. Sp. *Phora vitripennis* (Meig.).

Lissometopia, Lioy, l. c. p. 79. Allied to preceding; forehead naked; legs setulose; wings ciliated only at base, marginal vein simple, reaching beyond the middle of the wing. Sp. *Phora nudifrons* (Macq.).

MUSCIDÆ.

Tachinides.

Girard has published some notes on the Dipterous parasites of the silkworm, which he says belong to this group. The Ailantus silkworm (*Antheræa Cynthia*) is subject to the attacks of *Phorocera pumicata* (Meig.). Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 155-157.

New genera :—

Andrina, Lioy, Atti Ist. Ven. 3^a ser. tom. x. p. 72. Allied to *Weberia* (R.-D.); abdomen without appendages beneath the second segment; copulatory organ of ♂ much elongated, dilated posteriorly; first posterior cell closed, with a short peduncle. Sp. *Phania flavipalpis* (Macq.).

Entomophaga, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1332. Allied to *Actia* (R.-D.); second joint of antennæ short, third three times as long as second; externo-median vein complete, submarginal spinose. Sp. *Thryptocera exoleta* and *bicolor* (Meig.).

Echinogaster, Lioy, l. c. p. 1335. Allied to *Echinomyia*; third joint of antennæ dilated at extremity, first division with the arista nearly as long as the second. Sp. *Echinomyia argentifrons* (Macq.).

Sphyricea, Lioy, l. c. p. 1336. Allied to *Echinomyia*; body cylindrical; antennæ with the third joint nearly as long as the second, much dilated and rounded anteriorly; arista black, geniculate, first two joints equal, elongate. Sp. *Echinomyia sphyricea* (Macq.), *Cyphocera palustris* (Rond.).

Malpighina, Lioy, l. c. p. 1340. Allied to *Senometopia*; antennæ short; forehead linear in ♂; first posterior cell closed, with a very short peduncle; second transverse vein arcuate. Sp. *Tachina lugubris* (Meig.).

Trichoneura, Lioy, l. c. p. 1341. Allied to preceding; face somewhat oblique, with a few bristles; antennæ produced to the epistoma; mediastinal and submarginal veins spinose. Sp. *Tachina spinipennis* (Meig.).

Gymnophthalma (sic), Lioy, l. c. p. 1341. Allied to *Senometopia*; face somewhat oblique, naked; forehead broad; third joint of antennæ dilated; abdomen depressed; eyes naked; submarginal and interno-median veins spinose at base. Sp. *Tachina crassicornis* (Meig.).

Entomobia, Lioy, l. c. p. 1342 (*Eurygaster*, Macq. part. typic.). Body broad; face naked; abdomen oval; externo-median vein complete. Sp. *Tachina festiva* (Meig.), *Phryno agilis* (R.-D.), &c.

Eurigastrina (sic), Lioy, l. c. p. 1343. Allied to preceding; body broad; face bordered with bristles; eyes villose; externo-median vein complete, first posterior cell open. Sp. *Tachina vulgaris* (Meig.) and *Eurygaster parva* Macq.).

Diplomera, Lioy, l. c. p. 1349. Allied to *Meigenia* (R.-D.); third joint of antennæ rather more than twice as long as the second; arista tomentose; forehead narrow in ♂; abdomen with two small bristles in the middle of the segments. Sp. *Tachina biguttata* (Meig.), &c.

Entomobosca, Lioy, l. c. p. 1350. Allied to *Meigenia*; forehead narrow in ♂; third joint of antennæ three times as long as the second; first posterior cell closed rather far from the extremity; externo-median vein arcuate, second transverse straight. Sp. *Tachina spectabilis* (Meig.).

Acromera, Lioy, l. c. p. 1350. Allied to preceding; third joint of antennæ sharp in front, a little longer than second; first posterior cell closed before the extremity of the wing; externo-median vein arcuate. Sp. *Tachina clausa* (Macq.).

Leptostyla, Lioy, l. c. p. 1350. Allied to preceding; third joint of antennæ hardly twice as long as second; arista slender, slightly thickened for one-fourth of its length; first posterior cell closed almost at the extremity of the wing, with a short peduncle. Sp. *Tachina exilistyla* (Macq.).

Phanigaster, Lioy, Atti Ist. Ven. 3^a ser. tom. x. p. 61. Allied to *Clytia* (Macq.); antennæ elongate, reaching nearly to the epistoma; abdomen convex, transparent. Sp. *Musca helvola* (Fab.).

Sarcobia, Lioy, l. c. p. 62 (*Myobia*, auct. ex parte). Face naked; antennæ not descending quite to the epistoma, third joint twice as long as second; mediastinal and submarginal veins spinose, externo-median complete. Sp. *Tachina spreta* (Meig.).

Trisoneura (sic), Lioy, l. c. p. 68. (*Ptilocera*, ex parte). Face bordered with bristles; wings with many bristles on the outer margin before the mediastinal cell; posterior cell with a long peduncle. Sp. *Ptilocera cilipennis* (Macq.).

Macrosoma, Lioy, l. c. p. 69 (*Melanophora*, Macq. ex parte). Body large; face naked; forehead narrow in ♂; second joint of antennæ as long as third, which is compressed; arista villose; abdomen depressed; first posterior cell closed. Sp. *Musca maura* (Fab.).

New species:—

Masicera mysolana, Walker, Proc. Linn. Soc. vol. vii. p. 213, from Mysol;
M. sarcophagata, Walk. l. c. p. 235, from Ceram.

Eurygaster interdicta, Walk, *l. c.* p. 213, from Mysol.

Trichoprosopa? *divisa*, Walk. *l. c.* p. 213, from Mysol.

Rutilia ignobilis, Walk. *l. c.* p. 238, from Gorrite.

Doleschalla consors, Walk. *l. c.* p. 225, and *D. gonyopedoides*, Walk. *l. c.* p. 226, from Waigiou.

Prosenia secedens, Walk. *l. c.* p. 235, and *P. coacta*, Walk. *ibid.*, from Ceram.

Sarcophagides.

Omocera, g. n., Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 887. Allied to *Theria* and *Sarcophaga*; third joint of antennæ as long as the second, arista plumose. Sp. *O. ruralis* (Fall.).

Sferogaster (sic), Lioy, *l. c.* p. 889. Allied to *Sarcophaga*; antennæ much compressed and broad; arista plumose; anterior and intermediate tarsi in ♂ with straight, truncated, obtuse claws; posterior tibiæ of ♂ naked. Sp. *S. laticornis* (Macq.)?

Cynophaga, Lioy, *l. c.* p. 890 (*Sarcophaga*, auct. ex parte). Antennæ produced nearly to the epistoma, with the third joint four times as long as the second, arista with longer hairs above than below; basal segments of abdomen not setulose; externo-median vein much arched. Sp. *C. mortuorum* (Rob.-Desv.).

Sarcophaga innotata, sp. n., Walker, Proc. Linn. Soc. vol. vii. p. 214, from Mysol; *S. brevis*, sp. n., Walker, *l. c.* p. 236, from Ceram.

Muscides.

Curtoneura stabulans (Fall.) is described in all its states by Laboulbène among his tuberivorous insects: *l. c.* p. 83.

According to Perris, *Curtoneura stabulans* is not exclusively mycetophagous. He has obtained it twice from the gall produced on the oak by *Cynips palidus*, which likewise harbours other parasites. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 307.

Maravigna, g. n., Lioy, *l. c.* p. 891 (*Onesia*, Macq. ex parte). Wings with the first posterior cell closed. Sp. *M. clausa*, Macq.

New species :—

Silbomyia decrescens, Walk. Proc. Linn. Soc. vol. vii. p. 215, from Mysol.

Chrysomyia divitiosa, Walk. *l. c.* p. 215, from Mysol.

Pyrellia porphyricola, Walk. *l. c.* p. 215, from Mysol.

Musca sordidissima, Walk. *l. c.* p. 216, and *M. aricioides*, Walk. *ibid.*, from Mysol; and *M. præcox*, Walk. *l. c.* p. 236, from Ceram.

Anthomyides.

Anthomyia. Two species of this genus are described by Laboulbène as infesting truffles in the larva-state, namely *Anthomyia canicularis* (Linn.), *l. c.* p. 85, pl. 2. figs. 15-17, and *A. blepharipteroides* (L. Duf.), *l. c.* p. 87.

New genera :—

Psiloptera, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 906. Allied to *Hydrotea*; antennæ short, arista tomentose; abdomen oblong; anterior coxæ of ♂ with two spines at the extremity; posterior coxæ elongated and arcuate; wings narrow. Sp. *Anthomyia irritans* (Meig.).

Microcera, Lioy, l. c. p. 906. Allied to *Hydrotæa*; anterior coxæ of ♂ with two teeth; intermediate coxæ elongate, terminated by two long bristles; posterior elongate, with two perpendicular spines in the middle; legs simple in ♀. Sp. *Musca ciliata* (Fab.), *Anthomyia bimaculata* (Meig.).

Musciosoma, Lioy, l. c. p. 908 = *Hylemyia* (Rob.-Desv.), the latter name changed on account of its resemblance to *Hyalomyia*! Arista plumose; abdomen cylindrical; wings with a stigma on the outer margin. Sp. *Anthomyia præpotens* (Meig.), &c.

Gastrolepta, Lioy, l. c. p. 909 (= *Hylemyia*, Macq. ex parte). Arista with very short hairs; abdomen linear; wings with a stigma on outer margin. Sp. *Anthomyia coarctata* (Meig.).

Dendrophila, Lioy, l. c. p. 909. Allied to preceding; arista with long hairs; abdomen conical; wings with second transverse vein much arched, without a stigma. Sp. *Anthomyia ilaris* (Meig.), &c.

Oceromyia, Lioy, l. c. p. 910. Allied to preceding; antennæ short, arista with short hairs; wings with second transverse vein arched, without a stigma. Sp. *Hylemyia pallida* (Macq.).

Neurorta, Lioy, l. c. p. 910. Allied to preceding; antennæ short, arista with long hairs; wings without a stigma, second transverse vein straight. Sp. *Anthomyia grisea* (Meig.).

Cosmostyla, Lioy, l. c. p. 910. Allied to preceding; arista plumose; wings with a stigma, second transverse vein arched. Sp. *Hylemyia rufiventris* (Macq.).

Pachystoma, Lioy, l. c. p. 910. Allied to preceding; proboscis very large; arista plumose; abdomen oval; wings with a stigma, second transverse vein straight. Sp. *Anthomyia crassirostris* (Meig.).

Gynnogaster, Lioy, l. c. p. 989 (*Chortophila*, Macq. ex parte). Epistoma projecting, quadrate; abdomen not villose, without bristles beneath, with two appendages beneath penultimate segment in ♂; wings with second transverse vein perpendicular, straight. Sp. *Anthomyia dissecta* (Meig.).

Trigonostoma, Lioy, l. c. p. 990. Allied to preceding; epistoma salient, triangular; abdomen with two appendages beneath penultimate segment in ♂; second transverse vein perpendicular, straight. Sp. *Chortophila frontalis* (Macq.).

Botanophila, Lioy, l. c. p. 990. Allied to preceding; epistoma salient, triangular; abdomen with broad appendages; wings with a stigma, second transverse vein usually a little oblique. Sp. *Anthomyia varicolor* (Meig.).

Psilometopia, Lioy, l. c. p. 990. Allied to preceding; forehead linear, with the base triangular; epistoma prominent; abdomen without distinct appendages; second transverse vein rather oblique, straight. Sp. *Chortophila cæsia* (Macq.).

Erioischia, Lioy, l. c. p. 991. Allied to preceding; epistoma not prominent; arista nearly naked; abdomen with two subanal appendages in ♂; posterior coxæ with thick hairs at base; second transverse vein rather oblique and arched. Sp. *Chortophila floccosa* (Macq.).

Stenogaster, Lioy, l. c. p. 991 (name preoccupied in Rhynchota). Allied to preceding; epistoma not prominent; arista nearly naked; abdomen narrow, with two appendages beneath penultimate segment in ♂. Sp. *Chortophila angusta* (Macq.).

Lasiophthalma (sic), Lioy, l. c. p. 992. Allied to preceding; epistoma not prominent; third joint of antennæ short, oval, arista naked; abdomen oblong, depressed, not much elongated, with two appendages beneath penultimate segment in ♂; second transverse vein straight. Sp. *L. nigrovirescens*, Lioy, = *Chortophila lasiophthalma* (Macq.).

Eriopoda, Lioy, l. c. p. 994. Allied to *Fannia* and *Philinta* (Rob.-Desv.); intermediate and anterior tibiæ with a tubercle, posterior with long hairs; intermediate coxæ with a tuft of hairs. Sp. *Anthomyia ornata* (Meig.)

Cimbotoma (sic), Lioy, l. c. p. 994. Allied to preceding; first joint of intermediate tarsi in ♂ concave beneath, second dilated at extremity; abdomen without appendages. Sp. *Delia floricola* (R.-D.), *Anthomyia impressitarsis* (Macq.).

Eriostyla, Lioy, l. c. p. 997. Allied to *Cænusia* (Macq.); arista a little villose; second transverse vein distant from the first; wings with a stigma. Sp. *Eriostyla macquarti* (Lioy), *Cænusia dubia* (Macq.).

New species :—

Anthomyia polygoni, sp. n., Kaltenbach, Verhand. naturk. Ver. preuss. Rheinl. und Westph. 1864, p. 317. Allied to *A. megerlei* and *A. setaria*, but distinguished from the latter by an arched transverse vein and brownish-red forehead, and from the former by a naked arista, by four dark dorsal lines, and brownish-red forehead and vertex. The whitish larva lives on *Polygonum dumetorum* and *P. convolvuli*.

Aricia albicornis, Walker, Proc. Linn. Soc. vol. vii. p. 216, *A. leucoceros*, Walk. l. c. p. 217, *A. biplaga*, Walk. ibid., and *A. proluxa*, Walk. l. c. p. 218, from Mysol.

Cænusia liturata, Walk. l. c. p. 218, from Mysol.

Helomyzides.

Helomyza. Laboulbène has described the history of several species of this genus, the larvæ of which inhabit various species of Truffles. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 70-83. These species are *Helomyza lineata* (Rob.-Desv.), l. c. p. 70, pl. 2. fig. 11; *H. penicillata* (L. Duf.), l. c. p. 72; *H. tuberivora* (R.-Desv.), l. c. p. 72, pl. 2. figs. 1-10 (*H. hispanica*, Loew, is regarded by Laboulbène as a variety of this species); *H. pallida* (Fall.), l. c. p. 82; and *H. ustulata* (Meig.), l. c. p. 83. Laboulbène also mentions an undetermined species of this genus observed by Tulasne, l. c. p. 83.

New genera :—

Gymnostyla, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1000. Allied to *Cylindria* (R.-D.); head not narrowed behind; arista naked; second transverse vein arched. Sp. *Musca cucullaria* (Linn.).

Pachystyla, Lioy, l. c. p. 1005. Allied to *Cleigastra* (Macq.); body setulose; epistoma prominent; palpi much dilated; arista smooth, short, and thick; legs elongate, setulose; wings as long as the body. Sp. *Cordylura macrocera* and *latipalpis* (Meig.).

Cleigastrosoma, Lioy, l. c. p. 1006. Allied to preceding; epistoma not prominent; palpi filiform; antennæ long, extending to the epistoma, arista smooth; abdomen arcuate; wings long. Sp. *Cleigastra bicolor* (Macq.)?

Psilomyza, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1118. Allied to *Lep-*

tomyza; body slender; palpi stout, villose; epistoma with a few bristles; arista a little thickened at base, villose; abdomen of six distinct segments. wings elongate, second transverse vein remote from the inner margin. Sp. *Anthomyza gracilis* (Fall.).

New species :—

Cordylura præusta, Loew, Berl. entom. Zeitschr. 1864, p. 93, and *C. nana*, Loew, *ibid.*, from Canada; *C. lurida*, Schiner, Fauna Austr. ii. p. 4, Austria.

Norellia alpestris, Schiner, l. c. p. 6, from Tyrol and Croatia.

Cleigastra anthrax, Schiner, l. c. p. 12, Austria.

Hydromyza fallenii, Schiner, l. c. p. 14 = *Cordylura hydromyzina* (Fall.), from Greifswald.

Curtonotum perrisii, Schiner, l. c. p. 23 = *Helomyza gibba* (Perris), from South Tyrol.

Helomyza maxima, Schiner, l. c. p. 24, Austria; *H. apicalis*, Schiner, *ibid.* = *H. rufa* (Macq.); *H. meritoria*, Walker, Proc. Linn. Soc. vol. vii. p. 218, and *H. fissifera*, Walker, l. c. p. 219, from Mysol.

Leria longipennis, Schiner, l. c. p. 30, Austria.

Pæomyia leptiformis, Schiner, l. c. p. 43, Silesia.

Sciomyza lata, Schiner, l. c. p. 45 = *S. obtusa*, var. (Zett.).

Tetanocera vittigera, Schiner, l. c. p. 55, Austria and Silesia.

Tetanocera ambigua, Loew, Berl. entom. Zeitschr. 1864, p. 97, from Maine.

Limnia manni, Schiner, l. c. p. 59, from Carniola.

Borborides.

Cenchrinobia eggeri, Schiner, l. c. p. 335 = *Carnus hemapterus* (Egger).

New genera :—

Ischiolepta, Lioy, l. c. p. 1112. Allied to *Sphærocera* and *Borborus*; scutellum with six little teeth; posterior coxæ not incrassate. Sp. *Borborus denticulatus* (Meig.).

Lotophila, Lioy, l. c. p. 1113. Allied to *Borborus*; posterior tarsi with only the first joint dilated. Sp. *Borborus punctipennis* and *lugens* (Meig.).

Trichopoda, Lioy, l. c. p. 1113. Allied to preceding; tibiæ villose; posterior coxæ elongate, arcuate, villose externally; posterior tarsi spinose. Sp. *Borborus pallidifrons* (Fall.).

Eriosoma, Lioy, l. c. p. 1113 (name previously employed in Rhynchota). Allied to preceding; body villose; anterior legs very villose; intermediate tibiæ setulose. Sp. *Borborus niger* (Meig.).

Lotobia, Lioy, l. c. p. 1114. Allied to preceding; scutellum with the margin granulated; externo-median vein arcuate, approximate to the submarginal at the extremity; interno-median produced a little beyond the second transverse vein. Sp. *Borborus pallidiventris* (Meig.).

Cimbometopia (sic), Lioy, l. c. p. 1114. Allied to preceding; forehead with a deep furrow; first two joints of posterior tarsi a little dilated. Sp. *Borborus stercorarius* (Meig.).

Isogaster, Lioy, l. c. p. 1114. Allied to preceding; forehead not furrowed; abdominal segments nearly equal. Sp. *Borborus nigrofemoratus* (Macq.).

Fungobia, Lioy, *l. c.* p. 1114. Allied to preceding; palpi dilated; arista villose; scutellum nearly triangular; abdominal segments nearly equal; sexual organs with two filiform appendages; legs somewhat villose; intermediate tibiæ setulose; posterior coxæ in ♂ with a hook at the base. Sp. *Borborus nitidus* (Meig.).

Trichogaster, Lioy, *l. c.* p. 1116. Allied to *Limosina*; abdomen in ♂ with two tufts of small bristles at the extremity. Sp. *Borborus sylvaticus* (Meig.).

Rachispoda, Lioy, *l. c.* p. 1116. Allied to preceding; legs with small spines; first joint of posterior tarsi a little dilated. Sp. *Copromyza limosa* (Fall.).

Lotomyia, Lioy, *l. c.* p. 1116. Allied to preceding; submarginal vein arcuate, continued to the exterior margin before the extremity. Sp. *Limosina arcuata* (Macq.) and *Lotomyia flavescens*, sp. n., Lioy; differs from *L. arcuata* (Macq.) by having the scutellum yellowish. North Italy.

Coprobia, Lioy, *l. c.* p. 1116 (*Coprobis* already employed in Coleoptera). Allied to preceding; second joint of posterior tarsi a little dilated, twice as long as the first. Sp. *Copromyza fenestralis* (Fall.).

Sapromyzides.

Sapromyzosoma, g. n., Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1009. Allied to *Lycia* (R.-D.) and *Sapromyza*; posterior coxæ with a tuft of hairs at the extremity below; posterior tibiæ stout. Sp. *Sapromyza tibialis* (Macq.).

Stylocoma, g. n., Lioy, p. 1009. Allied to preceding; arista very plumose; third abdominal segment with a short, retractile, tubiform appendage on each side of the posterior margin. Sp. *Sapromyza tubifer* (Meig.)?

Sapromyza decora, sp. n., Loew, Berl. entom. Zeitschr. 1864, p. 97, from New York.—*S. löwii*, sp. n., Schiner, *l. c.* p. 104 = *S. bicolor* (Loew).

Ortalides.

New genera :—

Microstoma, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1020. Allied to *Platystoma*; buccal prominence small; epistoma not prominent; antennæ not reaching the epistoma, third joint oval, compressed, three times as long as the second; ♀ with a broad, truncate, projecting ovipositor. Sp. *Ortalis quinque-maculata* (Macq.).

Westermannia, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1022. Allied to *Tephritis*; palpi dilated, spatuliform; arista villose; epistoma not prominent; transverse veins approximate, the second oblique. Sp. *W. tephritisoides*, Lioy = *Trypeta westermanni* (Meig.).

Sineura, Lioy, *l. c.* p. 1024. Allied to *Tephritis*; arista naked; transverse veins greatly approximate. Sp. *Tephritis marginata* (Fall.).

New species :—

Trypeta (*Tephritis*) *segregata*, Frauenfeld, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 147, Taf. 5. fig. 3, from Halmstad; *T. (Aciura) winnertzii*, Frfld. *l. c.* p. 149, Taf. 5. fig. 4, from Sarepta.

Trypeta melaleuca, Walker, Proc. Linn. Soc. vol. vii. p. 238, from Ceram.

Spilographa giraudii, Frauenfeld, *l. c.* p. 382, Austria?

Myopites frauenfeldi, Schiner, *l. c.* p. 142 = *Trypeta blotii* (Frauenf.), *M. timbardæ*, Schiner, *l. c.* p. 142, from Dalmatia.

Ortalis leucomera, Walker, Proc. Linn. Soc. vol. vii. p. 219, from Mysol.
Strumeta helomyzoides, Walk. l. c. p. 220, from Mysol; *S. concisa*, Walk. l. c. p. 227, from Waigiou.

Lamprogaster sepsoides, Walk. l. c. p. 220, from Mysol.

Poticara tricurvata, Walk. l. c. p. 237, from Waigiou.

Platystoma tarsalis, Walk. l. c. p. 237, from Ceram; *P. protensa*, Walk. l. c. p. 228, from Waigiou.

Dacus sepedonoides, Walk. l. c. p. 228, and *D. curvifer*, Walk. l. c. p. 229, from Waigiou.

Achias aspiciens, Walker, Proc. Linn. Soc. vol. vii. p. 229, from Waigiou.

Sepsides.

Van der Wulp (Tijdschr. voor Ent. pp. 129-143) has some observations on the species of *Sepsis* and the allied genera, and on the distinctions of the genera of this group of *Muscidæ*, with especial reference to the forms met with in Holland.

New genera :—

Acrometopia, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1088 (*Sepsis*, auct. ex parte). Forehead with a pointed process; anterior coxæ in ♂ with a tooth; wings with two approximate transverse veins and a black spot at the extremity. Sp. *Sepsis cornuta* (Meig.).

Beggiata, Lioy, l. c. p. 1088. Allied to preceding; forehead not projecting; third joint of posterior tarsi in ♂ with a tuft of hairs beneath; wings as in preceding. Sp. *Sepsis barbipes* (Meig.)

New species :—

Themira dentimana, Van der Wulp (Tijdschr. voor Ent. vii. p. 135, pl. 8. fig. 6, fore leg), *T. curvipes*, Van der Wulp (l. c. p. 137, pl. 8. figs. 9-14), Holland.

Calobata contingens, Walker, Proc. Linn. Soc. vol. vii. p. 221, and *C. immiscens*, Walk. ibid., from Mysol.

Psilides.

Stearibia, g. n., Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1105 (*Piophila*, auct. ex parte). Forehead with two anterior pits; proboscis stout; epistoma not prominent, with two small bristles; antennæ pendent, short; scutellum flat. Sp. *Piophila foveolata* (Meig.).

Micropeza perclusa, sp. n., Walker, Proc. Linn. Soc. vol. vii. p. 230, from Waigiou.

Oscinides.

Cohn records the occurrence of a species of *Chlorops* in the wheat-fields of Silesia, in 1864, which in some places destroyed as much as 90 per cent. of the crop. This fly is double-brooded—the first brood appearing in June, the second early in August. Cohn describes the insect and the nature of its ravages, but states that it agrees with none of Meigen's species. It is very nearly allied to *C. lineata*. (Stett. ent. Zeit. 1864, pp. 413-417.)

Frauenfeld records the occurrence, near a destroyed egg of *Lixus turbatus* (Gyll.), of a Dipterous puparium, from which a small fly, supposed to be

Oscinis pusilla (Meig.) was developed. He considers it doubtful whether the *Oscinis*-larva was the destroyer of the egg. Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 695.

New genera :—

Macrothorax, Lioy, Atti Ist. Ven. 3^a ser. tom. ix. p. 1121. Allied to *Siphonella*; forehead smooth; scutellum large, hemispherical, margined with small bristles, and with two elongated bristles in the middle. Sp. *Siphonella ruficornis* (Macq.).

Cotilea, Lioy, l. c. p. 1123. Allied to *Chlorops*; forehead with its anterior margin advanced, with a deep furrow; arista of two distinct joints. Sp. *Chlorops gracilis* (Meig.).

Anthobia, Lioy, l. c. p. 1124. Allied to *Chlorops*; submarginal vein usually arcuate, not produced to the external margin; transverse veins closely approximate. Sp. *Chlorops lateralis* (Macq.) and *C. tarsata* (Meig.).

B tanobia, Lioy, l. c. 1125. Allied to *Oscinis*; marginal vein arcuate. Sp. *B. chloropsoides*, Lioy, and *Oscinis dubia* (Macq.).

Tricimba, Lioy, l. c. p. 1125. Allied to preceding; thorax with three furrows. Sp. *Oscinis lineella* (Fall.) and *Chlorops cincta* (Meig.).

Cryptoneura, Lioy, l. c. p. 1125. Allied to preceding; interno-median and externo-median veins not very distinct. Sp. *Chlorops flavitarsis* (Meig.).

Oscinisoma, Lioy, l. c. p. 1125. Allied to preceding; interno-median vein not produced quite to the margin of the wing. Sp. *Chlorops vitripennis* and *vindicata* (Meig.).

Oscinimorpha, Lioy, l. c. p. 1126. Allied to preceding; second transverse vein very oblique. Sp. *Oscinis obliqua* (Macq.).

Macrostyla, Lioy, l. c. p. 1126. Allied to preceding; arista long, plumose; scutellum convex, punctate. Sp. *Chlorops plumigera* (Meig.).

Geomyzides.

LOEW (Berl. ent. Zeits. 1864, p. 357 *et seq.*) indicates that the genus *Diastata* (Meig.), when freed from certain species, such as *D. luctuosa*, *obscura*, &c., which do not properly belong to it, may be divided into three groups, which will hereafter constitute so many genera. One of them has already been separated by Rondani under the name of *Thryptochaeta*. These groups are best characterized by the structure of the antennæ, but the clothing of the forehead and the venation of the wings furnish additional characters.

Group. I. DIASTATA, sensu stricto.

Antennæ nutant, second joint with a strong bristle at its end, third oval, with long pubescence, seta with long hairs; sixth longitudinal vein present, but abbreviated. Sp. *D. nebulosa* (Fall.)=*ornata* (Meig.); *D. unipunctata* (Zett.); *D. vagans* (Loew); *D. costata* (Meig.)=*fuscata* (Fall.); *D. inornata*, sp. n.

Group II. EUTHYCHÆTA (Loew).

Antennæ nutant, second joint with no horizontal bristle at the end, third

joint oval, with short pubescence, seta with short hairs; sixth longitudinal vein as in preceding. Sp. *D. spectabilis*, sp. n.

Group III. ΤΗΡΥΠΤΟΧΕΤΑ (Rond.).

Antennæ, applied to the face, reaching nearly to epistoma, second joint with a short and weak horizontal bristle at the end, third joint elongate, seta with short pubescence; sixth longitudinal nervure wanting. Sp. *D. punctum* (Meig.); *D. nigricornis* (sp. n.).

Diastata vagans, Loew, Berl. ent. Zeits. 1864, p. 362 = *D. obscurella* (Meig.) = *D. costata*, var. *b* (Zett.), Europe and North Asia; *D. inornata*, Loew, l. c. p. 364, Posen and Silesia; *D. spectabilis*, Loew, l. c. p. 365, Posen; *D. nigricornis*, Loew, l. c. p. 367 = ? *fumipennis* (Meig.), Germany.

New genera :—

Balioptera, Loew, Berl. ent. Zeits. 1864, p. 347 = *Opomyza* (Meig.) ex parte = *Geomyza* (Zett.) ex parte. Form very slender; antennæ depressed, arista pectinate above; tibiæ without an erect bristle near the apex above; alula not distinct; second longitudinal nervure unusually long, sixth wanting. Sp. *Balioptera combinata* (Lin.); *B. venusta* (Meig.) = *Op. tremula* (Hal.); *B. apicalis* (Meig.) = *Teph. maculata* (Ahr.) = *Geom. terminalis* (Zett.); *B. tripunctata* (Fall.), *B. majuscula*, sp. n., p. 356, from Germany. *Opom. lurida*, Loew, l. c. p. 98, from Sitka, also belongs to this genus.

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Gioenia, Lioy, l. c. p. 1110 (*Opomyza* auct. ex parte). Third joint of antennæ patelliform; second transverse vein far from the inner margin. Sp. *Opomyza albimana* (Meig.).

Cleptoneria, Lioy, l. c. p. 1120. Allied to *Gymnopa*; body very narrow; top of the forehead, thorax, and extremity of abdomen furnished with bristles; veins not very distinct. Sp. *Madija glabra* (Fall.).

Phytomyzides.

LOEW (Berl. ent. Zeits. 1864, p. 334 *et seq.*) states that Schiner has erroneously referred his *Heteroneura alpina* to *H. pictipes* (Zett.), and described the male of one variety of *H. albimana* (Meig.), distinguished by Loew, as *H. pictipes*, and its female with a second variety as *H. albimana*. Loew now publishes descriptions of the German species of this genus with their synonymy, as shown below :—

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A. Posterior transverse vein not far from the apex of the wing.

1. *decora* (Loew).

2. *flava* (Meig., Zett., Walk., Schin.) = *spurca* (Hal.).

B. Posterior transverse vein far from the apex of the wing.

3. *nigrimana* (sp. n.).

II. With a bristle on the tibiæ.

A. Transverse veins much approximated.

4. *albimana* (Meig., Loew), var. β *obscurior* = *pictipes* (Schin.).5. *ruficollis* (Meig., Loew) = *nubila* (Meig.) = *laterella* (Zett.).6. *alpina* (Loew).

B. Transverse veins less approximated.

7. *geomyzina* (Fall., Meig., Zett.).

Loew remarks that the character derived from the presence or absence of the bristle on the tibiæ does not seem to possess the importance that has been ascribed to it in a systematic point of view, as it is very difficult of application in the exotic species. Haliday and Zetterstedt have each founded a genus for *H. flava*, which the former denominated *Clusia* and the latter *Macrochira*. Loew indicates that both these names are preoccupied, and proposes the name of *Stomphastica* for the genus if it is to be regarded as distinct.

New genera :—

Macrurus, Lioy, Atti Ist. Ven. 3^a ser. tomo ix. p. 1313. Allied to *Agromyza*; abdomen elongated; posterior tibiæ much dilated, arcuate. Sp. *Agromyza latipes* (Meig.).

Phytobia, Lioy, l. c. p. 1313. Allied to preceding; second transverse vein oblique. Sp. *Agromyza errans* (Meig.).

Phyllophila, Lioy, l. c. p. 1313. Allied to preceding; arista tomentose; wings with the exterior margin finely ciliated at base, second transverse vein oblique. Sp. *Agromyza pallipes* (Macq.).

Agrobia, Lioy, l. c. p. 1313. Allied to preceding; wings with the outer margin finely setulose. Sp. *Agromyza pectinata* (Meig.).

Redia, Lioy, l. c. p. 1313. Allied to preceding; transverse veins situated near the base of the wing. Sp. *Agromyza gyrans* (Fall.); *A. luctuosa* (Meig.), &c.

Agrophila, Lioy, l. c. p. 1314. Allied to preceding; abdomen oval. *Agromyza exilis* (Meig.); *A. orbona* (Meig.), &c.

Anisoneura, Lioy, l. c. p. 1314. Allied to preceding; interno-median and externo-median veins indistinct. Sp. *Agromyza luteipennis* (Fall.)?

Dineura, Lioy, l. c. p. 1315. Allied to *Phytomyza*; wings with two transverse veins. Sp. *Phytomyza elegans* (Meig.), &c.

New species :—

Heteroneura melanostoma, Loew, Berl. ent. Zeits. 1864, p. 98, from New Hampshire; *H. nigrimana*, Loew, l. c. p. 338, Germany.

Phytomyza zetterstedtii, Schiner, Fauna Austr. p. 315, = *Ph. annulipes* (Zett.).

Phytomyza orobanchia, Kaltenbach, Verh. naturh. Vereins preuss. Rheinl. und Westph. 1864, p. 265. Head and antennæ yellow, third joint elliptic, arista thickened and black at the base, very fine and white towards the point, Labial hairs white; bristles of palpi and epistome black; point of the palpi with three little hairs, the lower of which is longest and directed downwards. Forehead brownish-yellow; a ring round the eyes, lip and lower part of the

face wax-yellow; eyes with green lustre. Pronotum and scutellum dirty-grey, and bearing some black bristles, like the forehead and hinder part of the body. Abdominal rings black, shining, with a very narrow yellow edge posteriorly. Halteres yellow; legs black, with the tips of the femora yellow; wings transparent, the 3rd, 4th, and 5th longitudinal veins very fine and transparent. The larva lives on *Orobanchæ*. Appears in April.

Agromyza populi, Kaltenbach, Verhand. naturh. Ver. preuss. Rheinl. und Westph. 1864, p. 336. This species belongs to Meigen's division C. c. Taf. 61. fig. 35. Individuals of the summer-generation are very similar to *A. flava*, but readily distinguished by the texture of the wings. Those coming forth in spring are grey or dark-grey; head, antennæ, halteres, and legs yellow.

Hydromyzides.

Discomyza incurva. Bergenstamm (Verh. zool.-bot. Ges. in Wien, Band xiv. pp. 713-716) describes the metamorphosis of this species, the larvæ of which are found in considerable numbers together in putrid snails. The specimen of *Helix pomatia* examined by Bergenstamm contained about 50 larvæ; when full-grown these attach themselves in rows, side by side, to the wall of the outer whorl of the snail-shell.

New genera :—

Hygrophila, Lioy, Atti Ist. Ven. 3^a ser. tomo ix. p. 1102. Allied to *Ephydra*; arista tomentose; first transverse vein near the middle of the wing, second near its inner margin. Sp. *Ephydra fascipennis* (Macq.).

Falosoma, Lioy, l. c. p. 1102. Allied to preceding; arista naked; first transverse vein near the base of the wing. Sp. *Ephydra aquila* (Fall.), *pictipennis* (Meig.), &c.

Myodris, Lioy, l. c. p. 1103. Allied to preceding; arista plumose; marginal vein without a terminal appendage. Sp. *Notiphila annulata* (Fall.).

Ephydrosoma, Lioy, l. c. p. 1103. Allied to preceding; face with two small bristles; arista tomentose; marginal vein without appendage, first transverse vein near middle of wing, second near its inner margin. Sp. *Ephydra rufipes* (Meig.).

New species :—

Ephydra subopaca, Loew, Berl. ent. Zeitsch. 1864, p. 98, from Connecticut.

Cavia spinosa, Loew, l. c. p. 99, from Massachusetts.

Notiphila ortalidoides, Walker, Proc. Linn. Soc. vol. vii. p. 222, and *N. unicolor*, Walk. ibid., from Mysol.

CESTRIDÆ.

Brauer (Verh. zool.-bot. Ges. in Wien, Band xiv. pp. 891-893) mentions the occurrence of Cestridan larvæ, probably belonging to the genus *Cestromyia*, upon a fieldmouse (*Hypudaeus arvalis*). These parasites were discovered by Hering; and the larvæ, with the tumours which they cause in the inguinal region of the fieldmouse, are described and figured by Brauer, l. c. p. 892, taf. 21.

Brauer also notices (l. c. p. 894), on Hering's authority, the occurrence of larvæ of *Dermatobia* on a puma (*Felis concolor*).

Ercolani describes the development of the larva of *Gasterophilus equi*; Rendic. Accad. Sci. Bologna, 1864, pp. 20-25.

Endocephala, g. n., Lioy, Atti Ist. Ven. 3^a ser. tomo x. p. 81, = *Cephenemyia* (Lat.), the latter name, in Lioy's opinion, too closely resembling *Cephalemyia*.

Krefft has given (Trans. Ent. Soc. N. S. W. p. 100, pl. 8) a description of the metamorphosis of a Dipterous parasite upon Australian frogs, belonging to the genus *Batrachomyia* (MacLeay). The parasitic larvæ are found between the skin and the flesh behind the tympanum; the larvæ are of a yellow colour, and may be squeezed through a small opening that exists over them. When they quit the frog the latter usually dies. The change to the pupa-state is usually effected on the lower surface of a piece of rock in some damp locality. The perfect insect emerged, in the case observed by Krefft, in thirty-two days. This parasite is common upon *Cystignathus sydneyensis*, and has also been met with upon *Uperoleia marmorata*, *Pseudophryne bibronii*, and *Hyla citropus*. (See also Brauer, Verh. zool.-bot. Ges. in Wien, Band xiv. pp. 894-896; and Entomologist, vol. ii. pp. 109-111.)

PLATYPEZIDÆ.

Platypeza fasciata (Fab.). Frauenfeld (Verh. zool.-bot. Ges. in Wien, Band xiv. pp. 68 & 69) describes the metamorphoses of this species, and indicates the differences presented by its larva and pupa when compared with those of *Scenopinus*. He observes that these differences in the preparatory states, as indeed those presented by the perfect insects, indicate the necessity of a separation of these two groups. The *Platypezidæ* he thinks most nearly allied to the *Anthomyiæ*, and the *Scenopinidæ* to the *Therevidæ*.

SYRPHIDÆ.

The larvæ of a species of *Cheilosia* living in truffles are mentioned by Laboulbène, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 88.

Walker publishes some observations on swarms of *Syrphi* observed last year in the Isle of Wight. Ent. M. Mag. vol. i. p. 139. (The Entomologist and Zoologist also contain notes on this subject.)

Walker describes the supposed male of his *Baccha purpuricola*. Proc. Linn. Soc. vol. vii. p. 212.

New genera :—

Eriops, Lioy, Atti Ist. Ven. 3^a ser. tomo ix. p. 743 (*Eristalis*, auct. ex parte). Arista naked; eyes villose; marginal cell of the wings closed, not reaching quite to outer margin of wing, much shorter than mediastinal cell. Sp. *E. tenax* (Fab.), &c.

Microrhincus, Lioy, l. c. p. 751. Allied to *Milesia*; face inferiorly prolonged, with a prominence; posterior coxæ without teeth. Sp. *M. vespiformis* (Linn.), *fallax* (Linn.), *bombylans* (Fab.), &c.

Psylogaster, Lioy, l. c. p. 753 (*Syrphus*, auct. ex parte). Abdomen narrower than thorax, minute. Sp. *P. grossulariæ* (Meig.), *mellinus* (Latr.), *rosarum* (Meig.), &c.

Axona, Walker, Proc. Linn. Soc. vol. vii. p. 211. Body subfusiform; head shortly conical; eyes very large (♂); antennæ very short, third joint round, arista naked; legs slender; wings acute, cubital vein much bent, anal sub-undulate. Sp. *A. volucelloides*, Walk. p. 212, from Mysol.

New species :—

Eristalis. Walker describes the following new species (Proc. Linn. Soc. vol. vii.): *Eristalis æquipars*, l. c. p. 210, *E. postscripta*, ibid., *E. erythropyga*, l. c. p. 211, and *E. placens*, ibid., from Mysol; and *E. merodontoides*, l. c. p. 234, from Ceram.

Spilomyia hamifera, Loew, Berl. ent. Zeits. 1864, p. 66, and *S. fusca*, Loew, l. c. p. 67, from Pennsylvania.

Temnostoma obscura, Loew, l. c. p. 67, from the Saskatchewan; *T. æqualis*, Loew, l. c. p. 68, from English River; and *T. alternans*, Loew, ibid., from Philadelphia.

Lepidomyia calopus, Loew, l. c. p. 69, from Cuba.

Xylota bicolor, Loew, l. c. p. 70, from Illinois; *X. fraudulosa*, Loew, l. c. p. 71, from Illinois and Wisconsin; and *X. barbata*, Loew, l. c. p. 70, from Sitka.

Chrysotoxum laterale, Loew, l. c. p. 72, from Nebraska; *C. pubescens*, Loew, ibid., from Illinois; and *C. ventricosum*, Loew, ibid., from Washington.

Microdon tristis, Loew, l. c. p. 73, from Virginia; *M. letus*, Loew, l. c. p. 74, from Cuba; and *M. coarctatus*, Loew, ibid., from Columbia.

Ceria abbreviata, Loew, l. c. p. 75, from Pennsylvania.

Lobiptera marginata, Mik (*margaritata* on plate and in its explanation), Verh. zool.-bot. Ges. in Wien, Band xiv. p. 796, Taf. 21. fig. 5.

CONOPIDÆ.

Bombidia, Liroy, Atti Ist. Ven. 3^a ser. tomo ix. p. 1326. Allied to *Conops*; forehead produced into a conical process; abdomen slightly narrowed at base. Sp. *Conops flavipes* (Linn.).

Arpagita, Liroy, l. c. p. 1327. Allied to *Myopa*; palpi long, cylindrical; abdomen broad, depressed. Sp. *Myopa dorsalis* (Fab.).

Cylindrogaster, Liroy, l. c. p. 1327. Allied to *Myopa*; palpi long, cylindrical; abdomen narrow, cylindrical, with the second segment elongate, and the last curved downwards. Sp. *Conops ferruginea* (Linn.).

Ischiodonta, Liroy, l. c. p. 1328. Allied to preceding; palpi long, curved; abdomen with the second and third segments laterally dilated; coxæ usually dentate. Sp. *Myopa fasciata* (Meig.), &c.

Conops metaxantha, sp. n., Walker, Proc. Linn. Soc. vol. vii. p. 225, from Waigiou.

HIPPOBOSCIDÆ.

Ornithomyia chinensis, Giglioli, Journ. Micr. Sci. vol. iv. p. 23, pl. 1 B. fig. 10, on *Turdus obscurus*, in China; *O. metallica*, Schiner, Fauna Austr. p. 646; *O. tenella* (Rogenhofer, MS.), Schiner, ibid.

Strebla molossa, Giglioli, l. c. p. 24, pl. 1 B. fig. 12, on a *Molossus*, in China.

NYCTERIBIIDÆ.

Polycenes, g. n., Westw. & Giglioli, l. c. p. 25. Head large, rounded in front, with a 3-jointed organ (antenna?) on each side, directed backwards; prothorax separated by a constriction, bordered behind by a row of large spines. Sp. *Polycenes molossus*, Westw. & Giglioli, l. c. p. 25, pl. 1 B. figs. 13 & 14, on a *Molossus*, in China.

1864. [VOL. I.]

NEUROPTERA.

BRAUER, FRIED. Erster Bericht über die auf der Weltfahrt der Kais. Fregatte Novara gesammelten Neuropteren. Verhandl. zool.-bot. Ges. in Wien, Band xiv. pp. 159-164.

The total number of Neuroptera (*sens. lat.*) collected during the voyage of the 'Novara' amounts to 107, belonging to 50 genera. Of these, 14 genera with 25 species belong to the true Neuroptera, and 36 genera with 82 species to the section Pseudoneuroptera of the Orthoptera. Of the latter (all *Odonata*) Brauer gives a list, and characterizes two new genera and one new species.

HAGEN, H. A. Névroptères (non Odonates) de la Corse, &c. (*Vide Orthoptera.*)

HAGEN, H. Ueber Phryganiden-Genäuse. Stett. entom. Zeitung, 1864, pp. 113-144 and 221-263.

HAGEN, H. Phryganidarum synopsis synonymica. Verhandl. zool.-bot. Gesellsch. in Wien, Bd. xiv. pp. 799-890.

M'LACHLAN, R. On the types of *Phryganidæ* described by Fabricius from the Banksian Collection. Trans. Ent. Soc. London, 3rd series, vol. i. pp. 656-659. March 1864 (read 7th December, 1863).

M'LACHLAN, R. On the Trichopterous genus *Polycentropus* and the allied genera. Entom. Monthly Mag. vol i. pp. 25-31.

M'LACHLAN, R. Notes on British Trichoptera. Entom. Annual, 1864, pp. 140-153.

M'LACHLAN, R. A synonymic list of the British Trichoptera. Entom. Annual, 1865, pp. 29-36.

MEYER-DÜRR, H. Zusammenstellung der auf meiner Reise durch Tessin und Ober-Engadin (1863) beobachteten und eingesammelten Neuroptern. Mittheil. Schweiz. entom. Ges. May 1864, pp. 219-225.

This paper contains a list of the species of Neuroptera (in the old sense) obtained by the author in the districts of Ticino and the Upper Engadin, with notes of the altitude at which many of the insects occurred, and indications of one or two new species.

General remarks on the order :—

MEYER-DÜRR (Mitth. Schw. ent. Ges. 1864, pp. 223-225) gives a list of 34 species of true Neuroptera obtained by him in the Upper Engadin and Ticino in 1863.

HAGEN (Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 38-46) gives

a list of 35 species of true Neuroptera occurring in Corsica, distributed as follows:—Hémérobides 10 sp., Ascalaphides 1 sp., Myrméléontides 4 sp., Raphidides 1 sp., Phryganides 19 sp. Several of the species are described as new.

HEMEROBIIDÆ.

Isoscelipteron (Costa). Brauer (Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 896-898) characterizes this genus, and remarks on the characters presented by the variation of the wings in the Hemerobiidæ. Brauer regards Walker's genus *Berotha* as probably identical with *Isoscelipteron*; if this supposition be correct, the former name must be adopted. The author describes *I. fulvum* (Costa) = *Dasypteryx græca* (Stein) and a new species from Pennsylvania.

Sartena, g. n., Hagen, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 41. Antennæ moniliform, much shorter than wings; ocelli 0; last joint of max. palpi long, suddenly narrowed, produced and pointed; prothorax short, tibiae cylindrical; tarsi with first joint longest; claws simple, with an ovoid pad; nervures of wings not numerous, reticulation resembling that of *Chrysopa*. Sp. *Sartena amœna*, Hagen, l. c. p. 41, from Corsica.

Ankylopteryx, g. n., Brauer, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 899. Allied to *Chrysopa*; maxillary palpi with basal joint short, third long, cylindrical, fourth short, fifth as long as the third; first joint of tarsi as long as the three following together; wings with the costal band very broad from the base, and the "simple transverse vein" nearest the base of the fore wing unites with the posterior branch of the outermost *venula subcubitalis* to form a triangular or pedunculate cell behind the third cell of the cubital band. Sp. *Hemerobius candidus* (Fab.), *Chrysopa punctata* (Hagen), *C. venusta* (Hagen), &c., and three new species.

Ankylopteryx (g. n.) *anomala*, sp. n., Brauer, l. c. p. 901, from the Nicobar islands; *A. immaculata*, sp. n., Brauer, ibid., from Van Diemen's Land; and *A. doleschaliæ*, sp. n., Brauer, ibid., from Amboyna.

Chrysopa corsica, sp. n., Hagen, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 40, from Corsica.

Isoscelipteron pennsylvanicum, sp. n., Brauer, l. c. p. 898.

Apochrysa coccinea, sp. n., Brauer, l. c. p. 899, from Amboyna; *A. nicobarica*, sp. n., Brauer, ibid., from the Nicobar Islands.

PHRYGANIDÆ.

McLachlan (Ent. Trans. 3rd ser. vol. i. pp. 656-659) gives a revision of the three Fabrician types of the old genus *Phryganea* contained in the collection of the late Sir Joseph Banks. According to him, *P. irrorata* (Fab.) is identical with *Limnephilus intercisus* (Walk.), and not with *Neuronion conca-tenata* (Walk.) as supposed by Dr. Hagen; *P. signata* (Fab.) is a *Brachy-centrus*, probably either *B. fuliginosus* (Walk.) or *B. incanus* (Hagen), which are very closely allied and may be identical; and *P. notata* (Fab.) is the same as *Dipseudopsis capensis* (Walk.), and Fabricius has been in error in giving North America as its habitat.

HAGEN has published a complete synonymic synopsis of the species of this family (Verh. zool.-bot. Ges. in Wien, Bd. xiv.

pp. 779-890). All the described families, genera, and species are arranged in alphabetical order; the names adopted by Hagen are marked with an †, and the rest are accompanied with indications of the genera or species with which they are synonymous. For the purpose of systematic arrangement the author gives, at the commencement of his list, a tabular view of the families and genera admitted by him.

M'Lachlan (Ent. M. Mag. vol. i. pp. 25-31) has described the British genera and species of *Hydropsychidæ*. He gives the following tabular arrangement of the genera of this group:—

- A. With a transverse vein towards the middle of the costal margin of the anterior wings uniting the costa and subcosta.
 - a. Anterior branch of *ramus discoidalis* in fore wings forming a forked cell on the apical margin.
 - b. Posterior wings broad, anal portion well developed, costal margin slightly concave.
 - c. Intermediate legs of ♀ not dilated . . . *Electrocnemia* (Steph.).
 - cc. Intermediate legs of ♀ dilated . . . *Polycentropus* (Curt.).
 - bb. Posterior wings narrow, especially at base; costal margin with a slight elevation near middle. *Ecnomus* (g. n.)
 - aa. Anterior branch of *ramus discoidalis* in fore wings simple. *Cyrnus* (Steph.).
- AA. Without a transverse vein uniting the costa and subcosta near the middle *Neureclipsis* (g. n.).

Sericostoma spencii. A. E. Eaton remarks on the variation of this species, Ent. M. Mag. vol. i. p. 47.

M'Lachlan describes and figures a curious caddisworm-case collected in Ceylon by Dr. Nietner. The case is tubular, tapering to a point, and nearly circular in section; the orifice is surmounted by a broad, nearly circular shield, convex above, concave beneath. The whole is composed of fine grains of sand cemented together. The case probably belongs to a species of *Setodes*. Ent. M. Mag. vol. i. pp. 125 & 126.

In an elaborate memoir on the cases of *Phryganidæ* (Stett. ent. Zeit. 1864, pp. 113-121) HAGEN gives a monographic description of these curious dwellings. In the first portion of his memoir he publishes some communications received from BREMI relating to the cases of Phryganidan larvæ living out of water, some of them belonging to the genus *Enoicyla*,—to a case supposed to be that of a species of *Agraylea*,—and to the discovery of some forms of convoluted cases, described under the name of *Helicopsyche*. Of the last-mentioned form Hagen names and describes 15 cases. The following is given as Bremi's classification of Phryganidan cases:—

- I. The attached cases are of the same type, namely, a longer or shorter oval, constructed of coarse or fine stones, attached to the upper or lower surfaces of stones.

II. Of the portable cases there are two types:—

A. Flat, like a bivalve shell; carried on the edge in walking, laid on the flat side during the pupa stage; composed of sand-grains or vegetable particles. Genus *Hydroptila*.

B. Elongate, tubular.

a. Tube exactly square, constructed of evenly united fragments of plants laid transversely and parallel to each other. Genus unknown.

b. Tube cylindrical.

1. Oval, semitransparent, formed of a mucilaginous substance which is probably exuded. Genus unknown.

2. Spirally twisted, formed of sand-grains, closed by a compact operculum. *Helicopsyche* (still unknown).

3. Cylindrical, much diminished behind, flat above, with projecting margins at the sides and over the mouth, composed of sand-grains; fastened mouth downwards during the pupa stage. Genus *Nais*.

4. Cylindrical, short, flat, of equal width, composed of small stones with much larger stones on the two sides; lying flat for the transformation. Genus *Trichostomum*.

5. Cylindrical, elongated, not much diminished behind, evenly built of sand-grains; placed perpendicularly during the pupa stage, and weighted at the foot with much larger stones. Genus *Odontocerus*.

6. Cylindrical, elongated, diminished behind, gently curved, formed of sand-grains; attached for its whole length to floating bodies during the pupa stage. Genus *Mystacides*.

7. Cylindrical, straight, elongated, composed of uniform portions of leaves united longitudinally. Genus *Trichostegia*.

8. Cylindrical, short, formed of transversely placed fragments of plants, floating. Genus *Chatotaulius*.

9. Cylindrical, elongate, rather wide in proportion to the length, uniform or a little narrowed behind, usually gently curved; materials variable, *Heteropalpi* of various genera; *Limnephilidae*, according to Burmeister.

10. Cylindrical, narrowed at both ends, formed of uniform sand-grains. Genus unknown.

Hagen subsequently (pp. 142-144 and 221-263) describes the cases of Phryganidæ in his collection in accordance with the arrangement of the perfect insects, interweaving with these descriptions the notices of habitations of Phryganidæ furnished by other authors, and especially by Pictet.

M^r LACHLAN (Ent. Ann. 1864, pp. 142-147) also refers to this subject, and indicates that the different forms of cases may be referred to two classes, namely:—

1. Case forming a complete tube round the body of the larva, often portable and carried about by its inhabitant, or fixed by one end or other parts to stones, &c. External form generally more or less tubular. The makers of these cases belong to the groups *Phryganides*, *Limnephilides*, *Sericostomides*, *Hydroptilides*, and *Leptocerides*.

2. Case not forming a complete tube, but incomplete on that side by which

it is constantly fixed. External form generally a more or less shapeless heap of small stones. *Rhyacophilides* and *Hydropsychides*.

The author also gives a sketch of the general characters presented by the cases of the more important genera.

M'LACHLAN (*l. c.* pp. 147-153) discusses the synonymy of several British species of Phryganidæ, and indicates two or three additions to be made to the British list.

The same author (*Ent. Ann.* 1865, pp. 29-36) publishes a catalogue of the British species of Trichoptera, in anticipation of a manual of these insects, which he announces as in a forward state of preparation. This catalogue, which gives the synonyms with the authors' names, but without references to works, includes 123 species, five of which are marked as undescribed. Two new genera are indicated: namely, *Triana*, allied to *Mystacides*, species *T. bicolor* (Curt.) and *T. conspersa* (Ramb.); and *Wormaldia*, allied to *Philopotamus*, species *W. occipitalis* (Pict.) and *W. subniger* (M'Lachl.).

E. Parfitt describes the economy of *Anabolia nervosa*. *Zoologist*, 1864, p. 8975.

New species :—

Sericostoma clypeatum, Hagen, *Ann. Ent. Soc. Fr.* 4^e sér. tome iv. p. 43, from Corsica.

Silo auratus, Hagen, *l. c.* p. 43, from Corsica. (Hagen also indicates two other probably new species of this genus from the same island, *l. c.* p. 44.)

Aspatherium frigidum, Meyer-Dürr, *Mitth. Schw. ent. Ges.* 1864, p. 223, and *A. medium*, Meyer-Dürr, *ibid.*, from the Upper Engadine.

Dasytoma togatum, Hagen, *l. c.* p. 44, from Corsica.

Philopotamus flavidus, Hagen, *l. c.* p. 44, from Corsica.

Aphelocheira meridionalis, Hagen, *l. c.* p. 44, from Corsica.

Polycentropus. Hagen indicates a species from Corsica allied to *P. flavomaculatus*, but smaller and probably distinct. *l. c.* p. 45.

Cyrnus flavidus, M'Lachl. *Ent. M. Mag.* vol. i. p. 29.

Enoicyla amœna, sp. n., Hagen, *Stett. ent. Zeit.* 1864, p. 120, from Switzerland.

Ecnomus, g. n., M'Lachl. *Ent. M. Mag.* vol. i. p. 30 (Cf. p. 564). Type *Philopotamus tenellus* (Ramb.).

Neureclipsis, g. n., M'Lachl. *l. c.* p. 30 (Cf. p. 564). Type *Phryganea bimaculata* (Lin.).

ORTHOPTERA.

(Orthoptera genuina.)

- BRAUER, FRIED. See Neuroptera (p. 562).
 BURMEISTER, H. Notiz über die *Mantis*-Arten bei Buenos-Ayres. Berliner entom. Zeitschr. 1864, pp. 234-238.
 DOHRN, H. Versuch einer Monographie der Dermapteren. Stettiner entom. Zeitung, 1864, pp. 285-296.
 KÜNSTLER, G. A. Ueber Heuschreckenfrass. Verhandl. zool.-bot. Gesellsch. in Wien, vol. xiv. pp. 769-776.
 MEINERT, F. Bemerkungen über den Bau des Hinterleibes bei den Forficulen. Arch. für Naturgesch. 1864, pp. 141-144.

This paper contains a discussion of some points raised by Professor Schaum, in opposition to the views put forward by Meinert in his paper on the *Forficulæ* (Kröyer's 'Tidsskrift'), as to the structure of the abdomen in those insects. The chief question between these authors relates to the number of abdominal segments—Meinert holding that the abdomen consists of ten segments, whilst Schaum maintains that there are only nine of them.

- PAGENSTECHER, H. A. Die Häutungen der Gespenstheuschrecke (*Mantis religiosa*). Arch. für Naturg. 1864, pp. 7-25, Tafel 1. A.

The author finds that *Mantis religiosa* moults at least seven times before attaining its perfect form. The different changes are described by him.

- PAGENSTECHER, H. A. Die blasenförmige Auftreibung der Vorderschienen bei den Männchen von *Stenobothrus sibiricus*. Ibid. pp. 26-31, Tafel 1 B.

This paper contains a description of the anatomical structure of the singularly dilated anterior tibiæ of the ♂ *Stenobothrus sibiricus*; the author believes them to be employed in holding the ♀ during copulation.

- SAUSSURE, H. DE. Blattarum novarum species aliquot. Revue et Mag. Zool. 1864, October (pp. 31).

- SCHAUM, H. Zur Orismologie des Hinterleibes von *Forficula*. Ibid. 1864, pp. 256-258.

A reply to Meinert's paper above cited.

- UHLER, P. R. Orthopterological Contributions. Proc. Entom. Soc. of Philadelphia, vol. ii. pp. 543-555. March 1864.

- WESTWOOD, J. O. Rectifications de la nomenclature de plusieurs espèces de Phasmides récemment décrites. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 201-205. 12th October, 1864 (read 10th February, 1864).

(Pseudoneuroptera.)

HAGEN, H. A. Névroptères (non Odonates) de la Corse, recueillis par M. E. Bellier de la Chavignerie en 1860 et 1861. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 38-45, and "Additions," l. c. p. 46. 8th June, 1864 (read 27th March, 1861, 9th July, 1862, and 13th May, 1863).

MEYER-DÜRR. See Neuroptera (p. 562).

SÉLYS-LONGCHAMPS, ED. DE. Catalogue des Névroptères Odonates de la Corse, établi d'après un examen des Chasses de M. E. Bellier de la Chavignerie faites en 1860 et en 1861. Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 35-47. 8th June, 1864 (read 27th March and 9th July, 1862).

VOLLENHOVEN, S. VAN. Bijdrage ter aanvulling van de Naamlijst der inlandsche Waternimfen. Bouwstoffen voor eene fauna van Nederland, 3de Deel, p. 188.

Contains a note of three species of Dragonflies (*Libellula fulva*, *L. dubia*, and *L. rubicunda*) new to the fauna of Holland.

WALSH, B. J. On the pupa of *Bætisca obesa* (Walsh). Proc. Entom. Soc. of Philadelphia, vol. iii. pp. 200-206. August 1864.

(Mallophaga.)

GIGLIOLI, HENRY. On some parasitical Insects from China. Journ. Microsc. Science, vol. iv. pp. 18-26. 1864.

(Thysanura.)

HALIDAY, A. H. *Iapyx*, a new genus of insects belonging to the stirps *Thysanura*, in the order *Neuroptera*. Linn. Trans. vol. xxiv. pp. 441-447, pl. 44.

THYSANURA.

HALIDAY (Linn. Trans. vol. xxiv. pp. 441-447) describes a new genus and species of this group from Southern Europe and Algeria, under the name of *Iapyx solifugus* (l. c. p. 442). This insect is most nearly allied to *Campodea* (Westw.), and, like it, appears to be intermediate in its characters between the *Lepismidæ* and *Poduridæ*; Haliday accordingly regards it as the type of a third family, *Iapygidæ*, the characters of which are shown, as compared with those of the other two families, in parallel columns on pp. 445, 446. The principal characters may be summed up as follows:—

I. Antennæ multiarticulate; claws two, equal; abdominal segments ten.
Fam. 1. *Lepismidæ*. Maxillæ bilobate, with long palpi; prothorax large;

tarsi pluriarticulate; caudal appendages uneven in number, three or more, pluriarticulate.

Fam. 2. *Iapygidae*. Maxillæ entire; palpi very short or obsolete; prothorax very small; tarsi exarticulate; caudal appendages two.

II. Antennæ pauciarticulate; claws one or two, in the latter case unequal; abdominal segments not more than seven.

Fam. 3. *Poduridæ*.

The second family, as already stated, includes only the genera *Campodea* (Westw.) and *Iapyx* (g. n.), the latter characterized as follows (p. 442):—"Antennæ apice sensim attenuatæ; maxilla radiis 4; palpi labiales biarticulati; abdominis segmenta anteriora mutica, extremum maximum, apice appendiculis 2 exarticulatis, rigidis, falcatis, intus denticulatis, abdomine multo brevioribus, forcipem prehensorium fingentibus." The species, *Iapyx solifugus*, is figured with anatomical details on plate 44, which also contains figures of various parts of *Campodea ambulans*.

MALLOPHAGA.

Giglioli (Quart. Journ. Micr. Sci. vol. iv.) describes and figures the following known species of this group: *Lipeurus diomedæ* (Fab.), l. c. p. 19, pl. 1B. figs. 1 & 2; *Docophoroides brevis* (Duf.) = *taurus* (Denny), l. c. p. 21, pl. 1B. figs. 3 & 4; both on species of albatros.

Docophorus mandarinus, sp. n., Giglioli, Journ. Micr. Sci. vol. iv. p. 22, pl. 1B. fig. 9, on *Merula mandarina*.

Nirmus mandarinus, sp. n., Gigl. l. c. p. 23, pl. 1B. figs. 7 & 8, on *Merula mandarina*.

PSEUDONEUROPTERA.

HAGEN records (Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 38-46) the occurrence in Corsica of 13 species of so-called Neuroptera with imperfect metamorphosis, exclusive of the Dragonflies, of which a catalogue is given by De Sélys-Longchamps. The number of species in each family is given by Hagen as follows: Termitides 2 species, Ephémérides 8 species, Perlides 3 species. Of these two are described as new species.

MEYER-DÜRR (Mitth. Schw. ent. Ges. 1864, pp. 220-223) gives a list of 37 species of Pseudoneuroptera observed by him in the Engadin and Ticino in 1863.

TERMITIDÆ.

On the prevention of the destruction of timber by Termites, some observations were made by Hearsey, Robinson, and Bates before the Entomological Society. Ent. Trans. 3rd ser. vol. i. Proc. pp. 185 & 186.

Bonavia records that an admixture of the pulp of the American aloe with a plaster of clay and cowdung preserved it from the attacks of White Ants in the gaol at Lucknow. Technologist, vol. v. p. 237.

LIBELLULIDÆ.

De SÉLYS-LONGCHAMPS records 24 species of this group in his

catalogue of the Neuroptera Odonata of Corsica (Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 35-37), 20 of which were collected by M. Bellier de la Chavignerie. The species are grouped as follows: *Libellulides* 8, *Æschnides* 3, *Agrionides* 13.

De Sélys-Longchamps states (*l. c.* p. 35) that his *Libellula cyenos*, the only supposed peculiar species of this group in Corsica, is a form of *L. brunnea* (Fonsc.).

Agrionoptera, g. n., Brauer, *l. c.* p. 163. Allied to *Polyneura*; "a *Libellula* with Calopterygine wings." Sp. *Libellula insignis* (Ramb.).

Gomphomacromia, g. n., Brauer, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 163. Allied to *Cordulia*; labial palpi two-jointed; triangle of fore and hind wings nearly similar, large, with no transverse vein; anal margin of hind wings in ♂ strongly emarginate, forming a projecting angle towards the body, rounded in ♀; eyes rather large, touching almost at a single point, sinuate on the temporal margin. *G. paradoxa*, sp. n., Brauer, *l. c.* p. 163, from Chili.

EPHEMERIDÆ.

Walsh describes and figures the pupa of *Bætisca obesa* (Walsh), which is remarkable for having the whole of the dorsal portion of the thoracic segments soldered together so as to form a large convex shield or carapace, beneath which the rudiments of the wings are concealed. Proc. Ent. Soc. Phil. vol. iii. pp. 200-206.

Bætis fallax, sp. n., Hagen, Ann. Soc. Ent. Fr. 4^e sér. tome iv. pp. 38 & 46, and *B. zebrata*, sp. n., Hagen, *l. c.* p. 38, from Corsica.

Bætis picteti, sp. n., Meyer-Dürr, Mitth. Schw. ent. Ges. 1864, p. 221.

Potamanthus modestus, sp. n., Hagen, *l. c.* p. 39, from Corsica.

ORTHOPTERA GENUINA.

FORFICULIDÆ.

H. DOHRN has continued his monographic revision of the Forficulidæ (Stett. ent. Zeit. 1864). In this portion of his memoir he characterizes the known genera *Forcinella* (Dohrn), *l. c.* p. 285, *Psalidophora* (Serv.), *l. c.* p. 417, and *Labia* (Leach), *l. c.* p. 423, and describes the species composing them, and establishes a new genus under the name of *Brachylabis*.

Dohrn (Stett. ent. Zeit. 1864) refers the following known species to his genus *Forcinella*: *Forficesila littorea* (White), *l. c.* p. 287; *Forficula maxima* (Brullé); *Forficesila annulipes* (Lucas); *Forficula annulicornis* (Blanch.); and *F. azteca* (Dohrn).

The same author refers to *Psalidophora* (Serv.), besides other known species, *Spongophora bipunctata* (Scudder), *l. c.* p. 419; *Forficula quadrimaculata* (Stål), *l. c.* p. 420; *Forficula punctipennis* (Stål), *l. c.* p. 421; and to *Labia* (Leach), *Forficula macronata* (Stål), *l. c.* p. 423; *Forficula amena* (Stål), *l. c.* p. 425; *Forficesila pilicornis* (Motsch.), *l. c.* p. 427; and *Forficesila curvicauda* (Motsch.) *l. c.* p. 428.

Forcinella (Dohrn). Dohrn describes the following new species of this

genus: *Forcinella janeirensis*, l. c. p. 285, from Rio de Janeiro; *F. Stål*, l. c. p. 286, from Java; *F. colossea*, ibid., from Australia and Polynesia; *F. marginalis*, l. c. p. 288, from Japan; *F. antoni*, l. c. p. 289, from Venezuela; *F. brunneri*, l. c. p. 291, from Adelaide.

Brachylabis, g. n., Dohrn, l. c. p. 292 (= *Forficesila*, part.). Wings 0; elytra rudimentary or 0; second and third segments of abdomen with lateral folds, sometimes indistinct on the second; antennæ with more than fifteen joints. Known species *B. mauritanica* (Lucas), *B. maritima* (Bonelli), *B. chilensis* (Blanch.), *B. mæsta* (Géné). *Brachylabis angulifera*, sp. n., Dohrn, l. c. p. 294, from Guinea.

Psalidophora pygmæa, Dohrn, l. c. p. 421, from Brazil; *P. frontalis*, Dohrn, l. c. p. 422, from Venezuela.

Labia ghilianii, Dohrn, l. c. p. 424, from South America; *L. luzonica*, Dohrn, l. c. p. 427, from Luzon; *L. wallacei*, Dohrn, ibid., from New Guinea; *L. macklini*, Dohrn, l. c. p. 428, from Brazil; *L. chalybea*, Dohrn, l. c. p. 429, from Venezuela.

BLATTIDÆ.

H. de Saussure describes the following new species (Rev. et Mag. Zool. 1864, October):—

Polyzosteria. *P. bighumis*, *anal*, *consobrina*, and *bicolor* from New Holland; *P. meridionalis*, *capensis*, and *pulchella* from South Africa.

Paratropes æquatorialis, Ecuador; *P. heydeniana*, Brazil.

Blatta phalerata and *capensis* from South Africa; *Bl. venosa*, *mexicana*, *pellucida*, and *translucida* from Mexico; *Bl. peruana* from Peru.

Ellipsoidion australe, *reticulatum*, and *aurantium* from New Holland; *E. heydenianum* from Brazil.

Ischnoptera brevipennis from Chile; *I. ignobilis* from Buenos Ayres; *I. juncea*, *similis*, and *erythrocephala* from South Africa.

Nyctobora terrestris and *obscura* from Brazil.

Euryzosteria (g. n.) *delalandii*, South Africa.

Periplaneta heydeniana, King George's Sound; *P. æthiopica*, Africa; *P. histrio*, East Indies, introduced into Brazil; *P. occidentalis*, West Indies; *P. alaris*, Brazil; *P. marginalis* and *soror*, New Holland; *P. regina*, Malacca.

Epilampra formicata, New Holland; *E. mediventris*, Van Diemen's Land; *E. heusseriana*, Uruguay; *E. bella*, *agathina*, *bivittata*, *crossea*, *heydeniana*, and *yersiniana* from Brazil.

Hypercompsa (g. n.) *fenestrina*, Brazil.

Prosoplecta (g. n.) *coccinella*; *Pr.* (*Diploptera*, subg. n.) *silpha*. Hab.—?

Aptera (g. n.) *lenticularis*, Cape of Good Hope.

Melestora ornata, Bombay.

Panchlora fervida and *africana*, from West Africa; *P. peruana*; *P. luteola*, Surinam; *P. lancadon*, Guatemala.

Nauphaeta amæna, Madagascar.

Zetobora castanea and *Z. verrucosa*, from South America.

Planetica phalangium, East Indies.

Brachycolla diabolus and *B. bilobata* from Brazil; *B.* (*Hormetica*) *chilensis* (Sauss. 1862).

Polyphaga syriaca, Syria.

Panesthia cribrata and *P. dilatata* from New Holland.

Blabera cubensis; *Bl. brasiliiana* and *minor* from Brazil; *Bl. deplanata*, West Indies; *Bl. claraziana*, Uruguay.

Monachoda. Thunberg's *M. grossa*, *biguttata*, and *reflexa* are characterized, each being regarded as the type of a subgenus, viz. *Monachoda*, *Monastria*, and *Petasodes*.

MANTIDÆ.

Burmeister (Berl. ent. Zeits. 1864, p. 234) records the surprising fact that the female of a species of *Mantis* (*M. argentina*, sp. n., p. 238) inhabiting the neighbourhood of Buenos Ayres is capable of seizing and destroying small birds. The attention of his informant was attracted by the cry of a bird, and, on going to the spot from which the sound proceeded, saw a specimen of *Serpophaga subcristata* (Vieill.) fluttering its wings upon the branch of a tree to which it was apparently secured. On procuring a ladder and ascending to the branch he found the bird, then dead, firmly held in the fore legs of a large *Mantis*, in such a position that its head was brought to the mouth of the insect, which had already torn away the skin and feathers of the crown, and commenced gnawing the skull. The living *Mantis* and the dead bird were brought to Burmeister, who declares himself satisfied of the veracity of his informant, and regards the circumstance not only as a proof of the truth of Zimmermann's assertion that the Mantides will kill and devour small Vertebrate animals, but also as evidence that this practice must be habitual with them. The *Mantis* is described by Burmeister as only three inches long. He records the occurrence at Buenos Ayres of three other species, namely, *M. præcaria*, *M. dimidiata*, and *M. unipunctata* of his 'Handbuch.'

PHASMIDÆ.

Westwood, Ann. Soc. Ent. Fr. 4^e série, tome iv. pl. 6, figures the female of *Monandroptera inuncans* (Serv.), fig. 2, and that of *M. undulata* (Westw.), fig. 3. Westwood maintains, l. c. pp. 201-204, that these two species are distinct, in opposition to the statements of Coquerel. Westwood also states that *Monandroptera spinigera* (Lucas) is identical with *Rhaphiderus scabrosus* (Guér.), l. c. p. 204; and is of opinion that *Cyphocrana? punctipes* (Serv.) is the female of *Achrioptera fallax* (Coq.), l. c. p. 205.

Diapheromera velii, sp. n., Walsh, Proc. Ent. Soc. Phil. vol. iii. p. 409, from Illinois.

Heteropteryx hopei, sp. n., Westw. Proc. Ent. Soc. Lond. 1864, p. 16, origin unknown.

Phyllium feejeeanum, sp. n., Westw. l. c. p. 17, from the Fiji islands.

GRYLLIDÆ.

New species and genera :—

Angus records the occurrence of house crickets, apparently different from the European *Gryllus domesticus*, at West Farms, New York. Proc. Ent. Soc. Phil. vol. iii. p. 44.

Phyllopalpus, g. n., Uhler, Proc. Ent. Soc. Phil. vol. ii. p. 543. Ocelli 0; antennæ twice as long as body, very slender, inserted level with lower margin of eyes, basal joint cylindrical; max. palpi large, joints hairy, apical joint much the longest, very broad, oval, lamelliform; scutellum inconspicuous; tegmina at least as long as body; anterior tibiæ with a tympanum;

basal joints of tarsi elongated. Sp. *P. pulchellus*, Uhler, l. c. p. 544, from Maryland and New York.

Orocharis, g. n., Uhler, l. c. p. 544. Ocelli approximate, placed in a triangle upon the frontal depression; antennæ inserted within lower line of eyes, setaceous, more than thrice length of body; max. palpi with third joint longest, cylindrical, fourth shorter than fifth, apical joint somewhat dolabiform; tegmina much longer than abdomen, wings longer than tegmina; basal joints of anterior and intermediate tarsi dilated, apical joints slender, as long as the two preceding together. Sp. *O. saltator*, Uhler, l. c. p. 545, from Baltimore.

Hapithus, g. n., Uhler, l. c. p. 546. Head nearly globose; eyes globose, deeply seated; ocelli small, placed as in *Nemobius*; antennæ setaceous, thrice length of body, basal joint much the thickest; max. palpi stout, apical joint longer than second and third together; tegmina shorter than abdomen; cerci very long and slender. Sp. *H. agitator*, Uhler, l. c. p. 546, from Baltimore.

Gryllotalpa cultriger, sp. n., Uhler, l. c. p. 543, from El Paso.

Gryllus personatus, sp. n., Uhler, l. c. p. 547, from Kansas.

LOCUSTIDÆ.

Camptonotus, g. n., Uhler, Proc. Ent. Soc. Phil. vol. ii. p. 548. Head large, oval, much broader than prothorax; face, vertex, and cheeks convex; eyes ovate, vertical, lateral; max. palpi long, last joint as long as penult.; antennæ five times as long as body; pronotum trapezoidal, meso- and metanotum very small; females apterous; cerci very short, hairy; ovipositor ensiform; first joint of tarsi equal to two following united. Sp. *C. scudderi*, Uhler, l. c. p. 549, from Baltimore.

Cyphoderris, g. n., Uhler, l. c. p. 551. Head globose above, deeply inserted into prothorax; eyes subglobose, not lateral; antennæ longer than body, nearly filiform, basal joint long, stout, and cylindrical; fore part of prothorax covering the head like a hood; tegmina ample, but not reaching apex of abdomen; anterior tibiæ with a large tympanal cavity; tibiæ spined. Sp. *C. monstrosus*, Uhler, l. c. p. 552, from the Oregon Territory.

Anabrus purpurascens, sp. n., Uhler, Proc. Ent. Soc. Phil. vol. ii. p. 550, from Minnesota, Washington, and Texas.

Saga syriaca, sp. n., Lucas, Bull. Soc. Ent. Fr. 1864, p. v, from the neighbourhood of Aleppo.

ACRYDIIDÆ.

Reiche mentions that immense clouds of locusts obstructed the march of the French soldiers in the south of Algeria during the last campaign in that country. Lucas believes the species to have been *Acrydium peregrinum*. Bull. Soc. Ent. Fr. 1864, p. xxviii.

Künstler reports (Verh. zool.-bot. Gesellsch. in Wien, Bd. xiv. pp. 769-776) upon the injury done in certain districts of Austria to plantations by Grasshoppers. These insects attack beeches, ashes, and other trees, preferring the younger plants, which they clear of their leaves, but then turn their attention even to trees sixty or seventy feet in height. The species obtained by Künstler was *Pezotettix alpina* (Koll.), var. *collina* (with developed wings),

which is identical with the insect described by Grunert (Forstliche Blätter, Heft 5, 1860) as *Gomphocerus cothurnatus* (Crtz.).

Frauenfeld describes the development of *Thamnotrizon apterus* (Fab.) from eggs deposited in the decaying wood of a poplar. Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 378.

Stenobothrus admirabilis, sp. n., Uhler, Proc. Ent. Soc. Phil. vol. ii. p. 553, from Baltimore.

Pezotettix scudderi, sp. n., Uhler, l. c. p. 555, from Baltimore.

RHYNCHOTA.

DUFOUR, L. Rectifications sur les Bélostomides. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 221. October 12, 1864.

DUFOUR, L. Notice sur une nouvelle espèce de Gallinsecte (*Aspidiotus? luzulæ*). Ibid. pp. 207-209, pl. 5. fig. 4. October 12, 1864 (read April 13, 1864).

FAUVEL, A. Remarques sur quelques points de l'Histoire de la Cochenille ou Kermès de la Vigne (*Coccus vitis*, Linn.). Bull. Soc. Linn. Norm. vol. viii. pp. 290-296.

FREI-GESSNER, E. Verzeichniss schweizerischen Insekten: Hemiptera. Mittheilungen Schweiz. entom. Gesellsch. 1864, pp. 195-203 & 225-244.

The author has commenced a catalogue of the Swiss Rhynchota, arranged in accordance with the method adopted by Fieber in his work on the European Hemiptera. The portion of the catalogue published in 1864 includes the Cryptocerata of Fieber (*Hydrocores*, Burm.) and the Gymnocerata of the same author (*Geocores*, Burm.), as far as the commencement of the *Lygæodæ* of his classification. Remarks on their mode of occurrence, and the localities in which they have been met with, are appended to the names of the species. One or two new species are described, and will be noticed hereafter.

FREI-GESSNER, E. Hemipterologisches. Mittheil. Schweiz. entom. Gesellsch. November 1864, pp. 259-263.

ICERY, E. Mémoire sur le Pou à poche blanche, présenté à la Chambre d'Agriculture de l'île Maurice. Mauritius, 1864, pp. 8, 6 plates.

LUCAS, H. Note relative au *Belostoma algeriense*. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 219, 220; et Quelques remarques relatives aux notes de MM. L. Dufour et V. Signoret sur les Bélostomides, l. c. pp. 226-228. October 12, 1864.

MARSHALL, T. A. An Essay towards a knowledge of British Homoptera. Entom. Monthly Mag. vol. i. pp. 150-155. (December 1864.)

This paper, of which the first part only is here published, is intended to furnish an analysis of the generic and specific characters of the British Homoptera. The present portion contains a tabular analysis of the genera of Homoptera auchenorrhyncha, and descriptions of the British *Cicada* and of four British species of *Cixius*.

MAYR, GUSTAV L. Diagnosen neuer Hemipteren. Verhandl. zool.-bot. Gesellsch. in Wien, Band xiv. pp. 903-914.

In this paper Mayr gives diagnoses of numerous species of *Geocores* belonging to the tribe *Scutata*, most of which are types of new genera, and also characterizes several new generic groups founded upon known species. The characters of these genera and species are published by Mayr for the purpose of securing his priority. The insects described form part of the material for the entomological section of the zoology of the voyage of the 'Novara.'

PHILIPPI, R. A. Coleopterodes, ein neues Geschlecht der Wanzen. Stettiner entom. Zeitung, 1864, pp. 306-308.

SCOTT, JOHN. Hemiptera: Additions to the Fauna of Great Britain (1863), and descriptions of two new species. Entom. Annual, 1864, pp. 154-162.

SIGNORET, VICTOR. Révision des Hémiptères de Chili. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. pp. 541-588, pls. 11-13. March 23, 1864 (read April 22, 1863).

SIGNORET, V. Observations à l'occasion d'une note sur le *Belostoma algeriense*, par M. H. Lucas. Ibid. tom. iv. pp. 222-225. October 12, 1864.

STÅL, C. Hemiptera nonnulla nova vel minus cognita. Ibid. tom. iv. pp. 47-68. June 8, 1864.

STÅL, C. Hemiptera Mexicana (continuatio). Stett. ent. Zeitung, 1864, pp. 49-86.

VUILLEFROY, FÉLIX DE. Hémiptères nouveaux. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 141, 142. June 8, 1864.

VUILLEFROY, FÉLIX DE. Revue du genre *Ectatops*, Amyot et Serville (*Pyrrhocoris*, Burm.). Ibid. pp. 143, 144. June 8, 1864.

SIGNORET (Ann. Soc. Ent. Fr. 4^e sér. tom. iii. pp. 541-588) has published a revision of the Chilean Rhynchota, with descriptions of the species described by Blanchard and Spinola in the 'Fauna Chilena,' remarks on their synonymy, and descriptions of many new species and genera.

STÅL (Stett. ent. Zeit. 1864, pp. 49-86) has continued his list of Mexican Rhynchota, the portion here published including all

the families of the Homoptera with the exception of the Plantice. The number of species enumerated is 175: namely, Fulgorida 34, Stridulantia 13, Cercopina 12, Membracida 47, and Jassina 69. The new species and genera are referred to in their proper places.

SCOTT has published a list of species of Heteroptera new to the British fauna discovered or detected in 1863, in the Entom. Annual, 1864 (pp. 154-162).

HETEROPTERA.

SCUTATA.

Scutellerides.

Stål characterizes the genus *Coptochilus* (Am. & Serv.) from the typical specimen in Signoret's collection. He regards it as most nearly allied to *Pachycoris*, and as having nothing to do with *Psacasta* and *Trigonosoma*, near which it was placed by Amyot and Serville. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 47.

New genera :—

Steganocerus, Mayr, Verh. zool.-bot. Ges. in Wien, Band xiv. p. 903. Allied to *Sphærocoris*; head semicircular, margined, central lobe as long as the lateral; bucculæ very narrow; rostrum reaching second segment of abdomen; prosternum lobate in front, concealing the bases of the antennæ; tibiæ externally with two furrows and three keels. Sp. *Tetyra argus* (Fab.).

Cryptacrus, Mayr, l. c. p. 904. Allied to *Pæcilocoris*; pronotum not sulcate, with an acute tooth on each side between the articulation of the hemelytra and the anterior angle of the scutellum; abdomen without silky spots. Sp. *Tetyra comes* (Fab.).

Lobothyreus, Mayr, l. c. p. 904. Allied to *Homæmus*; head narrowed in front, bisinuate at the sides; joints 1-3 of antennæ nearly equal; rostrum reaching second abdominal segment; scutellum narrower than abdomen, auriculate on each side behind; prosternum somewhat dilated; abdomen with silky spots, second segment impressed in the middle, sixth concealing the genital organs in ♂. Sp. *Pachycoris lobatus* (Hope).

Sphyrocoris, Mayr, l. c. p. 904. Allied to *Pachycoris*; head triangular, slightly convex, rounded in front, sides margined, not sinuate; second joint of antennæ a little longer than third; bucculæ short, arcuate, narrow; rostrum received in a narrow furrow of the sternum; prosternum narrowly dilated in front; scutellum with two impressed points at base; abdomen with silky spots, genitalia not concealed. Sp. *Pachycoris obliquus* (Germ.).

Diolcus, Mayr, l. c. p. 904 = *Symphylus* (Dall.). Sp. *Scutellera nebulosa* (Pal.), *Tetyra irrorata* (Fab.), and *Pachycoris flavescens* (Hope).

Deroplax, Mayr, l. c. p. 905. Allied to *Odontotarsus*; second joint of antennæ longer than third; bucculæ short; rostrum nearly reaching the abdomen; scutellum as broad as the abdomen, lateral margins parallel, posterior rounded; abdomen with silky spots on third and fourth segments. Sp. *Pachycoris circumductus* (Germ.).

Argocoris, Mayr, l. c. p. 905. Allied to *Hotea*; prothorax unarmed; scutellum not tuberculate, longer than broad, covering nearly the whole ab-

domen; abdomen with two silky spots, second segment not tuberculate. Sp. *A. redtenbacheri*, Mayr, *ibid.*, sp. n., from Sennaar.

Ellipsocoris, Mayr, *l. c.* p. 906. Oblong-elliptic, convex; head semicircular, lateral margins not sinuate, second joint of antennæ twice as long as third; rostrum reaching posterior coxæ; prosternum dilated in front, concealing base of antennæ; abdomen not furrowed, with silky spots; membrane with numerous veins; legs with numerous minute spines. Sp. *E. trilineatus*, Mayr, *ibid.*, sp. n., from Syria.

New species :—

Callidea coxalis, Stål, *Ann. Soc. Ent. Fr.* 4^e sér. tom. iv. p. 47, from Tringany.

Symphylus spinolæ, Sign. *ibid.* tom. iii. p. 542, from Chili.

Phymatocoris ? *chilensis*, Sign. *l. c.* p. 542, pl. 12. fig. 10, from Chili.

Odontoscelides.

Stål states (*l. c.* p. 48) that *Galgupha atra* (Am. & Serv.) is identical with *Odontoscelis unicolor* (Germ.).

Asopides.

Allocotus, g. n., Mayr, *l. c.* p. 906. Head triangular, median lobe a little longer than the lateral, which are denticulate; eyes globose, petiolate; antenniferous tubercles bidentate, first joint of antennæ projecting beyond apex of head; rostrum slender, reaching middle of metasternum; bucculæ very small, with two spines in front; prothorax laterally spinose; scutellum triangular; membrane with six simple veins; mesosternum with a slender median keel; abdomen unarmed; thighs spinulose beneath, posterior with two larger spines. Sp. *A. rogenhoferi*, sp. n., Mayr, *l. c.* p. 907, from Timor.

Dorycoris, g. n., Mayr, *l. c.* p. 906. Allied to *Zicrona*; abdominal spine reaching intermediate coxæ; posterior angles of the pronotum with a small tooth, antero-lateral margins convex in front, concave behind. Sp. *Pentatoma pavonina* (Hope).

Asopus cruciatus, sp. n., Sign. *Ann. Soc. Ent. Fr.* 4^e sér. tom. iii. p. 543, pl. 11. fig. 1, from Chili.

Arma tabida, sp. n. (Spin. MS.), Sign. *l. c.* p. 544, from Chili.

Cydnides.

Chilocoris, g. n., Mayr, *Verh. zool.-bot. Ges. in Wien*, Bd. xiv. p. 907. Allied to *Amnestus*; margin of head with erect spinules, central lobe as long as lateral; antennæ 5-jointed, second joint scarcely half as long as third; pronotum with elevated margins in front and at the sides. Sp. *C. nitidus*, sp. n., Mayr, p. 907, from Cashmere.

Æthus blanchardi, sp. n., Sign. *Ann. Soc. Ent. Fr.* 4^e sér. tom. iii. p. 545, pl. 12. fig. 11, and *Æ. spinolæ*, sp. n., Sign. *ibid.*, pl. 12. fig. 12, from Chili.

Sciocorides.

Stål states (*l. c.* p. 52) that *Dryptocephala dentata* (Fieb.) is identical with *D. punctata* (Am. & Serv.).

Abascantus, g. n., Stål, *l. c.* p. 51. Allied to *Cephaloplatys*; oval, depressed; lateral lobes of head contiguous in front; eyes moderately prominent; antennæ

slender, 4-jointed, second joint longest; rostrum slender, reaching the middle of the belly, inserted near base of head; margins of rostral canal elevated and divergent behind; thorax lobed on each side in front; abdomen widely furrowed beneath. Sp. *A. lobatus*, sp. n., Stål, l. c. p. 52, from Brazil.

Dryptocephala spinosa, sp. n., Mayr, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 907, from Brazil.

Halydides.

According to Stål, l. c. p. 52, *Rachava orbicularis* (Am. & Serv.) is the male of *Sympiezorhynchus tristis* (Spin.).

Eurystethus, g. n., Mayr, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 907. Body ovate, flat; head quadrate, foliaceous, obtusely denticulate in front of eyes; lateral lobes meeting; basal joint of antennæ not reaching apex of head, second joint shorter than third, fourth longest; second joint of rostrum twice as long as first, fourth equal to first; scutellum auriculate on each side at apex; membrane reticulated; abdomen with a narrow furrow. Sp. *E. nigropunctatus*, sp. n., Mayr, p. 908, from Brazil.

Ogmocoris, g. n., Mayr, l. c. p. 908. Allied to *Cænomorpha*; second joint of antennæ very short, third very long; rostral canal as long as the head, first joint of rostrum short, second and third equal; mesosternum with a low keel; first joint of tarsi somewhat longer than the apical one. Type *Atelocerus hypomelas* (Burm.).

Ablaptus, g. n., Stål, l. c. p. 49. Allied to *Sympiezorhynchus*; head rounded in front, unarmed at the sides; margins of rostral canal not much elevated, continued to base of head; antennæ 5-jointed, basal joint slightly passing the front of the head; rostrum slender, first joint reaching the anterior coxæ, second somewhat shorter than the third and fourth together; anterior angles of thorax with a tooth; mesosternum obtusely carinated. Sp. *A. amazonis*, sp. n., Stål, l. c. p. 49, from the Amazons.

Agalitus, g. n., Stål, l. c. p. 50. Allied to *Sympiezorhynchus*; head narrowed in front, slightly incised at the eyes, rounded and slightly emarginate in front; rostral canal elevated, continued to base of head; antennæ 5-jointed; rostrum very long, slender, first joint reaching base of prosternum, second longest; anterior angles of thorax with a tooth; sterna not elevated. Sp. *A. dromedurius*, sp. n., Stål, l. c. p. 50, and *A. fallenii*, sp. n., Stål, l. c. p. 51, from the Amazons.

Coriplatus reticulatus, sp. n., Stål, l. c. p. 48, from the Amazons.

Pentatomides.

Stål, l. c. p. 54, gives the following analysis of the genera which have been formed, very unnecessarily in the Recorder's opinion, at the expense of the genus *Acanthosoma* (Curt.):—

1. Posterior lateral margins of thorax neither dilated nor produced backward.
 - A. Basal margin of thorax wider than scutellum, posterior angles produced into a small tooth; anterior margin of the prostethium not produced; basal joint of antennæ not passing apex of head; apical margin of corium rounded. *Cyphostethus* (Fieb.).
 - B. Basal margin of thorax not wider than scutellum; anterior margin of

prostethium sometimes slightly produced; first joint of antennæ passing apex of head; apical margin of corium straight.

a. Second joint of antennæ shorter than third; mesosternal lamina not produced backward *Sastragala* (A. & S.) .

(type *S. uniguttata*, Don.).

b. Second joint of antennæ longer than third.

aa. Mesosternal lamina not produced backward.

Acanthosoma (Curt., Fieb.).

bb. Mesosternal lamina produced backward. *Elasmotethus* (Fieb.).

(type *E. dentatus*, De G.).

2. Posterior lateral margins of thorax slightly dilated, depressed; mesosternal lamina produced backward. *Elasmucha* (Stål)

(*Sastragala*, Fieb. nec A. & S.; *Elasmotethus*, Fieb. ad partem).

Pentatoma marmoratum (Mont.) is a species of *Axiagastus*, according to Stål, l. c. p. 52.

Stål states (l. c. p. 53) that his *Proxys geniculatus* is identical with *P. delirator* (Am. & Serv.).

New genera and species :—

Oxycoris, g. n., Mayr, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 909. Allied to *Mormidea*; head triangular, notched at apex, lateral lobes nearly meeting, longer than median; third joint of antennæ shorter than second; rostrum slender, basal and apical joints short; lateral angles of prothorax spinose, deflexed, anterior angles produced into a dentiform lobule; scutellum minute; membrane reticulate; sternum with a deep furrow. Type *Cimex cryptorhynchus* (Germ.).

Brachymenum, g. n., Mayr, l. c. p. 909. Allied to *Galedanta*; second joint of antennæ longer than third; head concave; lateral angles of thorax with a flattened process, emarginate at apex; hemelytra short, membrane minute; basal joint of tarsi oblong, oval, tumid. Sp. *B. circuli-centre*, sp. n., Mayr, p. 909, from the Cape of Good Hope.

Steleocoris, g. n., Mayr, l. c. p. 909. Body depressed, oval, triangular in front; lateral margins of head contiguous, rounded at apex; antennæ five-jointed, basal joint shorter than head, second very long, cylindrical, third and fifth equal to first, fourth somewhat longer; rostrum reaching intermediate coxæ; scutellum large, elongate-triangular, rounded at apex; membrane with seven or eight longitudinal veins; abdomen unarmed. Type *Cimex comma* (Thunb.).

Tropicorypha, g. n., Mayr, l. c. p. 910. Allied to *Tropicoris*; basal joint of antennæ not reaching apex of head, second, third, and fourth elongate and equal, fifth shorter; rostrum reaching second segment of abdomen, second joint twice as long as first, third equal to, and fourth shorter than the first; ocelli widely separated; membrane with seven simple veins; mesosternum carinated; abdomen unarmed, much wider than hemelytra. Type *Cimex deplanus* (H. Sch.).

Ancyrocoris, g. n., Mayr, l. c. p. 911. Allied to *Ælia*; head straight, not inclined; pronotum transversely elevated behind the middle, with no transverse furrow, lateral angles prominent, rounded; apex of corium acute; abdomen broader than the hemelytra; prosternum not dilated into a collar in front. Type *Ælia hastata* (H. Sch.), and one new species.

Halyomorpha, g. n., Mayr, l. c. p. 911. Allied to *Pentatoma*; head broad and rounded at apex, lateral margins elevated; second joint of antennæ shorter than third, remainder nearly equal; bucculæ narrow, dilated in front; rostrum reaching second or third segment of abdomen, second joint scarcely twice as long as first; ocelli distant; pronotum with a tooth at anterior angles, lateral angles prominent; membrane with nine nearly parallel veins; mesosternum carinated. Type *Halys timorensis* (Hope).

Rhombocoris, g. n., Mayr, l. c. p. 912. Allied to *Pentatoma*; antennæ stout, basal joint very short, second long, fourth narrowly petiolate at base; rostrum reaching base of thorax, basal joint as long as head, second twice as long, third and fourth short; mesosternum carinate; abdomen unarmed. Sp. *R. syriacus*, sp. n., Mayr, l. c. p. 912, from Syria.

Cylindrocnema, g. n., Mayr, l. c. p. 912. Allied to *Ditomotarsus* (most nearly to *Planois*, Sign.); abdomen rotundato-carinate, with a rounded protuberance at the base; third joint of antennæ as long as the first. Sp. *C. plana*, sp. n., Mayr, l. c. p. 913, from Chili.

Acedra, g. n., Signoret, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 547. Allied to *Pentatoma*; lateral lobes of head longer than median, elevated at the sides; humeral angles prominent, sides of thorax margined; membrane with nine or ten veins; fifth joint of antennæ longest. Sp. *A. reflexa*, sp. n., Sign. l. c. p. 547, pl. 12. fig. 13, from Chili.

SIGNORET (l. c. p. 548) proposes the formation of a subordinate group, to which he gives the name of *Ditomotarsites*, for a set of Pentatomid insects in which the sternum is unarmed, the tibiæ cylindrical, and the tarsi composed of only two joints. The type of this group is the genus *Ditomotarsus* of Spinola; Signoret establishes the following genera belonging to it:—

I. Abdomen unarmed.

a. Humeral angles rounded. *Ditomotarsus* (Spin.).

b. Humeral angles spinous.

* First joint of antennæ shorter than head . . . *Nopalis*, g. n.

† First joint of antennæ longer than head . . . *Planois*, g. n.

II. Abdomen spinous.

a. Elytra with more or less regular longitudinal veins.

Sinopla, g. n.

b. Elytra with more or less irregularly anastomosed veins.

* Humeral angles rounded. *Sniploa*, g. n.

† Humeral angles angular *Lanopis*, g. n.

Pharypia gracilirostris, sp. n., Stål, l. c. p. 53, from Bahia; *P. generosa*, sp. n., Stål, ibid., from Cayenne.

Loxa curvidens, sp. n., Mayr, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 909, from Brazil.

Euschistus inermis, sp. n., Mayr, l. c. p. 910, and *E. fallax*, Mayr, ibid., from Brazil.

Ancyrocoris (g. n.) *cordofanus*, sp. n., Mayr, l. c. p. 911, from Kordofan.

Rhopalimorpha similis, sp. n., Mayr, l. c. p. 912, from Auckland.

Nezara apicicornis, sp. n., Sign. l. c. p. 548, from Chili.

Ditomotarsus? geniculatus, sp. n., Sign. l. c. p. 549, pl. 12. fig. 14, from Chili.

Nopalis (g. n.) *sulcatus*, sp. n., Sign. l. c. p. 551, pl. 12. fig. 15, from Chili.

Planois (g. n.) *bimaculatus*, sp. n., Sign. l. c. p. 551, pl. 11. fig. 2, from Chili.

Sinopla (g. n.) *perpunctatus* (sic), sp. n., Sign. l. c. p. 552, pl. 12. fig. 16, and *S. humeralis*, sp. n., Sign. l. c. p. 553, from Chili.

Sniploa (g. n.) *obsoletus* (sic), sp. n., Sign. l. c. p. 554, pl. 12. fig. 17, from Chili.

Lanopis (g. n.) *rugosus*, sp. n., Sign. l. c. p. 554, pl. 12. fig. 18, and *L. variabilis*, sp. n., Sign. l. c. p. 585, from Chili.

Edessides.

Dictyocoris, g. n., Mayr, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 913. Allied to *Cyclopelta*; pronotum convex behind, its anterior angles furnished with a small tooth; metasternum widely sulcate, broadly rounded behind; femora and tibiæ unarmed. Type *Cimex mactans* (Fab.).

Placocoris, g. n., Mayr, l. c. p. 913. Body oval, much depressed; antennæ five-jointed, second joint very short, apical longest; rostrum slender, but little passing the anterior coxæ, second joint longest; pronotum unarmed; membrane large, with eight simple veins; mesosternum flat; metasternum flat, acute behind; abdomen with a small basal spine; femora spinulose beneath, posterior incrassate, with larger spines; third joint of tarsi longest. Sp. *P. viridis*, sp. n., Mayr, l. c. p. 914, from Brazil.

Phyllocephalides.

Stål states, l. c. p. 55, from an examination of the typical specimens, that *Dalsira affinis* (Am. & Serv.) is identical with *Edessa modesta* (Fab.), and *Dalsira marginata* (Am. & Serv.) with *Edessa costalis* (Germ.) = *Basicryptus costalis* (H. Sch.).

SUPERICORNIA.

Stål describes *Nematopus nervosus* (Lap.) from the typical specimen. Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 56.

According to Stål (l. c. p. 57), *Therapha cinerea* (Am. & Serv.) is identical with *Serinetha* (*Leptocoris*) *coturnix* (Burm.).

Acocopus, g. n., Stål, l. c. p. 55. Allied to *Nematopus*; head quadrate, antenniferous tubercles stout, free, median lobe suddenly deflexed between them; rostrum reaching middle of mesosternum; antennæ shorter than the body, basal joint stout, somewhat shorter than fourth; thorax constricted in front; abdomen narrowed behind, dilated at apex, segments armed with a spine at the apex; posterior tibiæ straight, with spines beneath. Sp. *A. verrucifer*, sp. n., Stål, p. 56, from the Amazons.

Dalcera, g. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 556. Allied to *Ceratopachys*; antenniferous tubercles with a slight spine externally; antennæ not dilated, second joint shorter than third; rostrum reaching middle of mesosternum; femora spinous, posterior tibiæ slightly dilated. Sp. *D. lacerdæ*, sp. n., Sign. p. 556, pl. 13. fig. 19, from Chili.

Eldarca, g. n., Sign. l. c. p. 557. Allied to *Rhopalus* (?); head triangular, prominent in front; ocelli very small (omitted in figure); antennæ with

the first joint long and stout, second shorter than third, equal to fourth, which is fusiform and not much thickened; posterior femora sometimes finely denticulated at the apex. Type *Merocoris hematomeru* (Spin.); three new species.

Neides spinosissimus, sp. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 555, from Chili.

Eldarica (g. n.) *nigra*, sp. n., Sign. l. c. p. 558, *E. germainii*, sp. n., Sign. ibid., pl. 11. fig. 3, and *E. sulcicornis*, sp. n., Sign. ibid., pl. 13. fig. 20, from Chili.

Pseudophlæus muticus, sp. n., Sign. l. c. p. 559, pl. 13. fig. 21, from Chili.

Margus distinctus, sp. n., Sign. l. c. p. 559, pl. 13. fig. 22, *M. nigro-punctatus*, sp. n., Sign. l. c. p. 560, pl. 13. fig. 23, *M. nervoso-punctatus*, sp. n., Sign. ibid., pl. 13. fig. 24, from Chili.

CÆCIGENIA.

De Vuillefroy has given (Ann. Soc. Ent. Fr. 4^e sér. tom. iv. pp. 143-144) a tabular synopsis of the species of the genus *Ectatops* (Am. & Serv.), distinguished from *Pyr rhocoris* by its pedunculated eyes. He describes six species, *E. ophthalmicus* (Burm.), *E. limbatus* (Am. & Serv.), *E. rubiaceus* (Am. & Serv.), and three new ones.

Erlaeda, g. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tom. iii. p. 567. Allied to *Arhapha*; head globular, constricted behind; antennæ with the first joint very small, the rest long and nearly equal; prothorax narrow in front, strongly constricted near the hinder margin; anterior femora much thickened and spinous. Sp. *E. araphæoides*, sp. n., Sign. l. c. p. 567, pl. 11. fig. 4, from Chili.

Ectatops distinctus, sp. n., De Vuillefroy, l. c. p. 144, from Silhet; *E. lateralis*, sp. n., De Vuillef. ibid., from Silhet; and *E. obscurus*, sp. n., De Vuillef. ibid., from Malacca.

CAPSINA.

Léon Dufour describes and figures *Cryptostemma alienum* (H. Sch.), Ann. Soc. Ent. Fr. 4^e sér. tom. iv. p. 211, pl. 5. fig. 3.

Monosynamma scotti, sp. n. (Fieber, MS.), Scott, Ent. Ann. 1864, p. 160, fig. 5, British.

Lopus fallax, sp. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 570, from Chili.

Cyllocoris jucundus, sp. n., Sign. l. c. p. 570, pl. 11. fig. 5, from Chili. A variety of *C. scutellatus* (Spin.), according to Signoret, l. c. p. 586.

Capsus speciosus, sp. n., Sign. l. c. p. 571, and *C. ocellatus*, Sign. l. c. p. 572, from Chili.

Orthotylus fieberi, sp. n., Frei-Gessner, Mittheil. Schw. ent. Ges. 1864, p. 260, from Sarepta.

Agalliasstes kirgisicus, sp. n. (Becker), Frei-Gessner, l. c. p. 261, from Sarepta.

Placochilus sareptanus, sp. n., Frei-Gessner, l. c. p. 262, from Sarepta.

MEMBRANACEA.

Syrtides.

Phymata nervoso-punctata, sp. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tome iii.

p. 574, pl. 13. fig. 25, and *P. elongata*, sp. n., Sign. *ibid.*, pl. 13. fig. 26, from Chili.

Acanthiides.

Acanthia — sp. ? Frei-Gessner, Mitth. Schweiz. Ent. Ges. 1864, p. 234. From nests of the Swift.

Tingidides.

Frei-Gessner remarks (Mitth. Schw. ent. Ges. 1864, p. 259) that *Zosmenus atriplicis* (Becker) from Sarepta is identical with a species from Algeria, named by Perris *Z. leprieuri*.

*Solenostoma**, g. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 575. Allied to *Monanthia*; rostral canal greatly developed, rostrum entirely concealed, canal continued along the sternum as far as the intermediate legs; antennæ with second joint shortest, first and third longest, first and second stoutest; scutellum concealed by the tricarinated prothorax; elytra with no membrane. Sp. *S. liliputiana*, sp. n., Sign. p. 575, pl. 13. fig. 27, from Chili.

Colcopterodes, g. n., Philippi, Stett. ent. Zeit. 1864, p. 307. This genus appears to be nearly identical with the preceding; ocelli 0; rostrum in a deep canal; third joint of antennæ slender, equal to first and second together; tarsi of two joints, basal joint minute. Sp. *C. fuscescens*, sp. n., Phil. l. c. p. 308, from Santiago; described by Philippi as resembling a small Curculionid, such as *Anthonomus*, the antennæ being laid close together during life, and carried in an extended position so as to produce the appearance of a long, slender rostrum.

Tingis tilia, sp. n., Walsh, Proc. Ent. Soc. Phil. vol. iii. p. 408, and *T. amorphæ*, sp. n., Walsh, l. c. p. 209, from Illinois.

Cantacader germainii, sp. n., Sign. l. c. p. 586, from Chili.

REDUVINI.

Reduviides.

Stål refers *Platymerus rubro-picta* (H.-Sch.) and *Reduvius obsoletus* (Blanch.) to the genus *Spiniger*, and remarks that the former is from Cayenne. L. c. pp. 58, 59.

Racelda, g. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 579. Allied to *Cæcina* (Stål); head longer than broad, constricted behind; first joint of rostrum equal to the other two; second joint of antennæ one-third longer than first, third and fourth very small, remainder wanting; anterior disk of prothorax not much elevated, smooth; scutellum with the extremity bifid; legs slender, anterior femora scarcely inflated. Sp. *R. alternans*, sp. n., Sign. p. 579, pl. 11. fig. 6, from Chili.

Pothea æneo-nitens, sp. n., Stål, l. c. p. 59, from N. America; and *P. dichroa*, sp. n., Stål, *ibid.*, from Brazil.

Allæorhynchus vinulus, sp. n., Stål, l. c. p. 59, from Java.

Harpactorides.

Stål describes *Plæogaster mammosus* (Am. & Serv.) from the type in Signoret's collection, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 57; and also

* This name is preoccupied by a genus of fishes.—Ed.

characterizes the genus *Passaleutus* (Am. & Serv.), which he regards as most nearly related to *Plæogaster*, l. c. p. 57.

Harpagocoris obscuricrus, sp. n., Stål, l. c. tome iv. p. 57, from Caffraria.

Sycanus generosus, sp. n., Stål, l. c. p. 58, and *Sycanus pyrrholomus*, sp. n., Stål, ibid., from Manilla.

Zelides.

Stål, l. c. p. 59, describes *Ploiaria acanthifera* (Mont.) under the corrected name of *Saica acanthophora*.

Atrachelus curvidens, sp. n., Sign. l. c. p. 580, from Chili.

Holotrichiides.

Petalochœirus australis, sp. n., De Vuillefroy, Ann. Soc. Ent. 4^e série, tome iv. p. 142, pl. 1. fig. 9, from Malacca; *P. apetalus*, sp. n., De Vuillefroy, ibid., pl. 1. fig. 10, from Malacca.

Emesides.

Emesella dohrni, sp. n., Sign. l. c. p. 587, from Chili.

HYDROMETRIDÆ.

Hydrometra servillei, sp. n. (Meyer), Frei-Gessner, Mitth. Schweiz. ent. Ges. 1864, p. 228, from Switzerland.

GALGULIDÆ.

Mononyx parvulus, sp. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 588, from Chili.

NEPIDÆ.

Lucas remarks (Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 219) that *Belostoma algeriense* (Duf.) belongs to *Hydrocyrius* (Spin.), with which *Ilyotrephes* (Stål) is synonymous. He adds that, in the opinion of L. Dufour, *Ilyotrephes herculeus* (Stål) is identical with *Hydrocyrius columbiæ* (Spin.) and also with *Belostoma algeriense* (Duf.). Lucas also considers the species to be perhaps identical with *B. grande*, and it has been described, under the name of *B. cosmopolitanum*, by Coinde in the Rev. et Mag. de Zool. 1863.

Léon Dufour (l. c. p. 221) corrects some errata in his 'Essai sur les Bêlostomides,' and notes that *Limnegeton* (Mayr) is synonymous with *Borborotrepes* (Stål).

Signoret (l. c. pp. 222-225) remarks upon the characters of the genus *Diplonychus* (Lap.), and indicates that that genus is imperfectly characterized, and that it is a question what its real type is. Signoret agrees with Lucas and Dufour in regarding *Belost. algeriense*, *B. grande*, *Hydrocyrius columbiæ*, and *Ilyotrephes herculeus* as identical, but is doubtful whether *B. cosmopolitanum* (Coinde) belongs to the same species. Signoret also maintains, in opposition to L. Dufour and Lucas, that the rostrum in the *Belostomidæ* is composed of four joints, the third joint being very short and only visible on the upper surface of the rostrum, as described by Léon Dufour in 1855 in the Mém. de l'Acad. Roy. de Liège.

Belostoma deyrolli, sp. n., De Vuillefroy, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 141, pl. 1. fig. 5, from Japan.

Appasus japonicus, sp. n., De Vuillefroy, l. c. p. 141, pl. 1. fig. 7, from Japan.

HOMOPTERA.

STRIDULANTIA.

Stål has given a detailed description of the *Cicada quadrituberculata* (Sign.), which he refers to the genus *Dundubia* (Am. & Serv.). Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 60.

Proarna, g. n., Stål, Stett. ent. Zeit. 1864, p. 61. Allied to *Tympanoterpis*; rostrum reaching or passing the posterior coxæ; elytra with the ulnar veins distant, apical areas eight, inner basal area slightly dilated towards the apex; wings with six apical areas; anterior femora thickened, trispinose. Sp. *T. hilaris* (Germ.), *T. pulvereæ* (Oliv.), *C. grisea* (Fab.), and *C. albida* (Oliv.). *Proarna sallei*, sp. n., Stål, l. c. p. 61, from Mexico.

Calyria virginea, sp. n., Stål, l. c. p. 56, from Mexico.

Carineta ancilla, sp. n., Stål, l. c. p. 57, and *C. lugubrina*, sp. n., Stål, ibid., from Mexico.

Zammara callichroma, sp. n., Stål, l. c. p. 57, from Mexico.

Odopæa. Four new Mexican species are described by Stål: *Odopæa montezuma*, l. c. p. 58; *O. imbellis*, l. c. p. 59; *O. signoreti*, ibid.; *O. medea*, l. c. p. 60.

Fidicina pertinax, sp. n., Stål, l. c. p. 62, from Mexico.

Cicada alacris, sp. n., Stål, l. c. p. 62, from Mexico.

FULGORIDÆ.

Smith (Address to Ent. Soc. London, 25th January, 1864, pp. 207-209) reasserts the luminosity of *Fulgora laternaria* in opposition to the statements of Treffry (Zoologist, July 1863), and quotes, in support of his opinion, the testimony of Mr. Henderson of Belize, communicated to the Royal Physical Society of Edinburgh in 1859. He also cites, in favour of the luminosity of the Chinese *Fulgora candelaria*, the testimony of two sailors and of Count Yedlety d'Enzenberg. The latter stated that he had seen these insects "shining with great brilliancy at night, and that the luminosity flashed out at intervals, like a revolving light."

Smith, in reply to objections raised by Newman (Proc. Ent. Soc. Lond. 1864, p. 14), quotes a statement by a Mr. James Smith of Dalston on the history of *Fulgora candelaria*, according to which that insect diffuses a pale blue or green light from the extremity of its cephalic process during the summer months. It is known in China as the "Star of Eve," the "Eye of Confucius," and the "Spark fly," and is more luminous when sitting than when flying. The luminosity is brightest in the female, and ceases in both sexes after copulation.

Bates (l. c. p. 15) states that he never observed any luminosity in *Fulgora laternaria*, nor did he find it reported to be luminous among the natives of the Amazons Valley, who, however, know the insect well, and believe it to be venomous.

Stål has described *Pæocera perspicillata* (Fab.) and its varieties, which include *Lystra pallida* (Guér.), *L. specularis* (Germ.), and probably *L. oculata* (Germ.). He also describes *Pæocera turca* (Fab.) and its varieties, including *Lystra diana* (Germ.) and *Pæocera humilifera* (Stål). Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 62, 63.

Stål also characterizes the genera *Dracela* (Sign.) and *Lappida* (Am. & Serv.) According to the same author, *Paciloptera truncaticornis* (Spin.) belongs to the genus *Copsyrna*, and *Ricania sexmaculata* (Sign.) to *Vutina*: l. c. p. 64.

Marshall describes the known British species of the genus *Cixius*. Ent. M. Mag. vol. i. pp. 154-156.

New species and genera :—

Calerda, g. n., Signoret, Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 583. Allied to *Cixius*; head rounded, with no keel separating the vertex from the forehead. Sp. *C. biocellata*, sp. n., Sign. l. c. p. 584, pl. 11. fig. 8, from Chili.

Amantia, g. n., Stål, Stett. ent. Zeit. 1864, p. 49, note. Allied to *Pæocera*; head rounded in front, somewhat prominent in front of the eyes, forehead with a transverse keel near the apex; second joint of antennæ subglobose; thorax large, produced and truncated behind; posterior tibiæ with four or five spines. Sp. *Pæocera combusta* (Westw.), and *P. imperatoria* (Gerst.).

Tomintus, g. n., Stål, l. c. p. 49, note. Allied to *Cyrtoptus*; head broad, angulated in front, forehead without keels; clypeus scarcely carinated; thorax and scutellum together broader than long, scutellum twice as long as thorax, which has the basal margin nearly straight; legs short, posterior tibiæ 4-spinose. Sp. *Calyptoproctus pudicus*.

Picinnna, g. n., Stål, l. c. p. 52. Allied to *Thionia*; elytra with three longitudinal veins, the first furcate near the base, the second far from the base, the third beyond the middle, transverse venules rare and obsolete; posterior tibiæ 4-spinose. Sp. *P. varians*, sp. n., Stål, l. c. p. 52, and *P. mexicana*, sp. n., Stål, l. c. p. 53, from Mexico.

Gatulia, g. n., Stål, l. c. p. 54. Allied to *Nogodina*; sides of clypeus not carinated; vertex narrow; prothorax short, angulated; scutellum very large, tricarinate; legs slender, posterior tibiæ 3-spinose. Sp. *Gatulia pudibunda*, sp. n., Stål, p. 54, from Mexico.

Hypæpa transversalis, sp. n., Sign. l. c. p. 583, pl. 11. fig. 7, from Chili.

Cixius unidentatus, sp. n., Sign. l. c. p. 583, from Chili.

Nersia nigrolineata, sp. n., Stål, Stett. ent. Zeit. 1864, p. 50, from Mexico.

Bothriocera signoreti, sp. n., Stål, l. c. p. 50, from Mexico.

Delphax pictifrons, sp. n., Stål, l. c. p. 50, from Mexico.

Thionia variegata, sp. n., Stål, l. c. p. 51, and *T. maculipes*, sp. n., Stål, ibid., from Mexico.

Nogodina pictifrons, sp. n., Stål, l. c. p. 53, from Mexico.

Phalenomorpha sordida, sp. n., Stål, l. c. p. 54, from Mexico.

Ormenis pallescens, sp. n., Stål, l. c. p. 55, *O. infuscata*, sp. n., Stål, ibid., and *O. leucophæa*, sp. n., Stål, ibid., from Mexico.

Acanonia producta, sp. n., Stål, l. c. p. 56, *A. decens*, sp. n., Stål, ibid., and *A. virescens*, sp. n., Stål, ibid., from Mexico.

MEMBRACIDÆ.

Phacusa, g. n., Stål, Stett. ent. Zeit. 1864, p. 72. Allied to *Acutalis*; head triangular, forehead nasute; ocelli equidistant from each other and from

the eyes; thorax convex, narrowed behind, lateral margins touching the inner margin of the elytra; elytra very large; posterior tarsi long. Sp. *P. flavo-marginata*, sp. n., Stål, l. c. p. 72, from Mexico.

Membracis. Of the restricted genus *Membracis* Stål describes three new Mexican species: *M. sellata*, Stett. ent. Zeit. 1864, p. 67; *M. trimaculata*, l. c. p. 68; *M. apicalis*, ibid.

Sphongophorus claviger, sp. n., Stål, l. c. p. 68, from Mexico.

Hoplophora histrionica, sp. n., Stål, l. c. p. 69, from Mexico.

Ceresa. The following new species from Mexico are described by Stål: *C. patruelis*, l. c. p. 69; *C. salléi*, l. c. p. 70; *C. puncticeps*, ibid.

Heteronotus quinquenodosus, sp. n., Stål, l. c. p. 70, from Mexico.

Aconophora mexicana, sp. n., Stål, l. c. p. 70.

Smilia. Three Mexican species described by Stål, l. c. p. 71: *S. foliacea*, *S. cristifera*, *S. carinata*.

Acutalis nigrolineata, sp. n., Stål, l. c. p. 72, from Mexico.

Smilia unicolor, sp. n., Sign. Ann. Soc. Ent. Fr. 4^e sér. tome iii. p. 584, from Chili.

Melyzoderes dohrnii, sp. n., Sign. l. c. p. 584, pl. 11. fig. 9, from Chili.

Centrotus longicornis, sp. n., De Vuillefroy, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 142, pl. 1. fig. 8, from Malacca.

CICADELLINA.

Eurymelides.

Æthalion dilatatum, sp. n., Stål, l. c. p. 73, from Mexico.

Cercopides.

Philemus, g. n., Stål, Stett. ent. Zeit. 1864, pp. 66 (*Aphrophora*, Germ. ex parte). Head obtusely triangular, vertex flat, anterior margin sulcate; thorax with lateral margins very short; scutellum longer than broad; legs rather short, anterior femora and tibiae of equal length, posterior tibiae bi-spinose. Known species *P. spumarius*, *P. lineatus*, *P. campestris*, *P. exclamationis*, and *P. caffer*. *P. fusco-varius*, sp. n., Stål, l. c. p. 66, from Mexico.

Tomaspis (including *Rhinaulax*, *Moncephora*, *Tricophora* (? *Triccephora*), and *Spinorhina*). Stål describes the following new Mexican species: *Tomaspis pictipennis*, Stett. ent. Zeit. 1864, p. 63; *T. fasciaticollis*, ibid.; *T. nuptialis*, l. c. p. 64; *T. vittatipennis*, ibid.; *T. ornatipennis*, ibid.; *T. varians*, l. c. p. 65; *T. limbata*, ibid.; and *T. sepulchralis*, ibid.

Ptyelus siccifolius, sp. n., Stål, l. c. p. 65, from Mexico.

Lepyronia sordida, sp. n., Stål, l. c. p. 67, from Mexico.

Jassides.

Stål refers his *Selenocephalus costalis* to the genus *Siva* (Spin.), and states that his *Selenoc. punctato-nervosus* is the same as *S. obsoletus* (Burm.). Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 66.

New genera and species :—

Hecalus, g. n., Stål, Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 65. Allied to *Siva* (Spin.); depressed; head produced, rounded at apex, margins attenuated;

face somewhat convex, cheeks deeply sinuated beneath the eyes; eyes small; ocelli on the margin close to the eyes; thorax transverse, its margins straight; anterior tibiæ with few and delicate spines, posterior tibiæ with very numerous spines. Sp. *H. (Petalcephalus) paykulli* (Stål), *H. pallescens*, sp. n., Stål, p. 65, from North Australia.

Thaumastus, g. n., Stål, l. c. p. 67. Allied to *Ledra*; head broader than thorax, face suddenly much narrowed beneath the eyes, obtusely angular at the apex; eyes limited externally by the dilated margin of the head; ocelli nearer to the eyes than to each other; posterior tibiæ quadrangular, with the angles spinulose; first joint of posterior tarsi shorter than the other two together. Type *Ledra marmorata* (Blanch.).

Ledromorpha, g. n., Stål, l. c. p. 68. Head foliaceous, concave beneath, face produced between the anterior legs; ocelli about equidistant from each other and the eyes; thorax transverse, hexagonal; tibiæ dilated, posterior triquetrous, dilated and remotely serrated externally. Type *L. planirostris* = *Fulgora planirostris* (Don.) = *Ledra gladiata* (Blanch.). *Ledromorpha vaginata*, sp. n., Stål, p. 68, from Moreton Bay.

Acucephalus carinatus, Stål, l. c. p. 64, from Algeria.

Selenocephalus egregius, Stål, l. c. p. 66, from Burmah; and *S. florii*, Stål, l. c. p. 67, from Greece.

Tettigonia. Stål describes eight new Mexican species of this genus: *Tettigoniæ multivirgata*, Stett. ent. Zeit. 1864, p. 73; *T. ruficeps*, ibid.; *T. urbana*, l. c. p. 74; *T. limbaticollis*, l. c. p. 75; *T. hilaris*, ibid.; *T. venusta*, ibid.; *T. sirena*, l. c. p. 76; *T. magica*, l. c. p. 77.

Phera (Stål) = *Proconia* (Am. & Serv.). Stål describes three new species from Mexico: *Phera tartarea*, l. c. p. 78; *P. wallengreni*, ibid.; *P. tiarata*, l. c. p. 79.

Aulacizes. Four new species from Mexico are described by Stål: *Aulacizes thunbergii*, l. c. p. 79; *A. nitidipennis*, ibid.; *A. multiguttata*, l. c. p. 80; *A. coriacea*, ibid.

Gypona. Stål describes twelve new species of this genus from Mexico: *Gypona bohemani*, l. c. p. 81; *G. vinula*, ibid.; *G. dohrnii*, *G. punctipennis*, and *G. wallengreni*, l. c. p. 82; *G. miliaris*, *G. signoreti*, and *G. schaumii*, l. c. p. 83; *G. fuscinervis*, *G. verticalis*, *G. unicolor*, and *G. germari*, l. c. p. 84.

Stragania humilis, Stål, l. c. p. 85, and *S. misella*, Stål, ibid., from Mexico.

Cælidia. Four new Mexican species are described by Stål, l. c. p. 85: namely, *Cælidia marginata*, *C. flaviceps*, *C. guttatinervis*, and *C. fasciaticollis*.

Jassus fasciaticollis, Stål, l. c. p. 86, from Mexico.

PSYLLIDÆ.

Frauenfeld describes the larvæ and pupæ of *Psylla fraxini* (Lin.) and *P. crataegi* (Scop.), and the effects produced by them upon the leaves of their food-plants. Verh. zool.-bot. Ges. in Wien, Bd. xiv. pp. 690, 691.

Psylla (Trioza) neilreichi, sp. n., Frauenfeld, Verh. zool.-bot. Ges. in Wien, Bd. xiv. p. 689. Lives on the inflorescence of *Valeriana dentata* (Poll.).

COCCIDÆ.

Coccus. In a memoir presented to the Chamber of Agriculture of the

Mauritius, E. Icery describes, under the name of "*Le Pou à poche blanche*," a species of *Coccus* which has done much injury to the sugar-canes in that island. He describes the development of the larvæ from the eggs, and the attachment of the female and mode of deposition of the eggs; but from his description and figures of the male, and of its larva and pupa, it is evident that he has mistaken a minute Hymenopterous parasite for that sex of the *Coccus*.

Fauvel has published some observations on the natural history of the *Coccus* of the Vine (*Lecanium vitis*) in Bull. Soc. Linn. Norm. vol. viii. pp. 290-296.

Aspidiotus? luzula, sp. n., L. Duf. Ann. Soc. Ent. Fr. 4^e sér. tome iv. p. 208, pl. 5. fig. 4, on the leaves of *Luzula maxima* in South-western France.

ROTIFERA

BY

J. REAY GREENE, B.A.

MOXON, W. Notes on some points in the Anatomy of *Rotatoria*. Trans. Linn. Soc. xxiv. 1864 (pp. 455-462, with a plate).

WEISSE, J. F. Ueber die Entwicklung der Eier der *Floscularia ornata*, Ehr. Zeitschr. f. wiss. Zool. xiv. Band, 1864 (pp. 107-8, with a plate).

Dr. Moxon's notes on the *Rotifera* refer to the following points:—

- a. Determination of the dorsal and ventral aspects of the organism.
- b. Structural relations of the "feelers" (setæ-bearing spots).
- c. The alimentary canal; and
- d. The water-vascular system.

a. In the middle line of a Rotifer may be noticed, anteriorly, the dorsal feeler, and, posteriorly, the opening of the cloaca. By the presence of these two characters the dorsal aspect is best distinguished. The eyes are always situate on the dorsal side of the oesophagus, while the mouth, on the other hand, is ventral in its direction. When the dorsal and ventral sides differ in contour, the former is that which is arched, and along which the intestine runs. In such Rotifers, when locomotive,

the arched side is most remote from the surface over which the animal moves.

b. Moxon asserts the presence of a median dorsal feeler in *Melicerta*, *Floscularia*, *Metopidia*, *Limnias*, and *Pterodina*; also of lateral feelers in *Limnias* and *Floscularia*, and probably in all the stationary genera. In the two forms just mentioned the lateral feelers are symmetrically placed towards the ventral aspect, on slight conical elevations, "close to the part which forms the upper end when the lobes are retracted."

The stalked lateral feelers of *Melicerta* have long been known, but no one has hitherto described the median feeler, which is "sessile on the back of the head, behind and between the eyes in the young, and on the same side of the body as the cloacal opening." For these reasons it is, doubtless, homologous to the stalked dorsal feeler of *Philodina*.

c. The anterior portion of the alimentary canal is more complex in *Floscularia* than in any other Rotifer. A "highly irritable cilium-clothed sphincter of irregular outline" separates the oral vestibule from the so-called pharynx with strong muscular walls, which immediately precedes the unusually large gizzard or manducatory cavity. This is furnished with a peculiar apparatus, the "tube valve," entirely mistaken by previous observers. It consists of a long "thin-walled, flattened, cilium-lined tube," continuous above with the margin of the pharyngeal opening, while its opposite end waves loosely about in the interior of the gizzard. In three instances Moxon has seen this tube discharge its contents by a process of complete eversion, involving the entire alimentary canal in front of the gizzard. The prey, which the pharynx receives by an act of true deglutition, readily passes through the tube into the cavity of the gizzard. From this, however, its return, save at the will of the animal, is, by the very same means, rendered impossible, the closely-approximated walls of the now flattened tube impeding all progress in an oral direction. The presence of such a valve Moxon believes to be unknown elsewhere in the animal kingdom.

In *Euchlanis dilatata* there exists a cloacal sphincter, just below the ovarian and intestinal openings. This sphincter being closed, Moxon saw the contents of the contractile vesicle injected into the intestine when packed with fecal matter so that its cilia were quite motionless. On entry of the foreign liquid, the action of the cilia soon commenced, and, being seconded by renewed efforts of the contractile vesicle, quickly succeeded in effecting a complete defecation.

d. Moxon has discovered a water-vascular system both in *Limnias* and *Floscularia*. In the latter genus its vessels are relatively of very small diameter. He has seen nothing of the peculiar circulating system described by Gosse, but the granules

referred to by that observer were found moving freely within the general cavity of the body.

Pterodina possesses five pairs of the usual ciliated appendages, the presence of which Leydig was not able to determine.

From his observations on *Euchlanis dilatata*, seen in different positions, Moxon concludes that the "tags," or cilium funnels, of this and other *Rotifera* are triangular enlargements, their (inner) surfaces covered with numerous short cilia. It is probable that the cilia are on two opposed surfaces, not on a single plane, but in any case it would appear that the "candle-flame-like appearance," ascribed to one long flickering cilium contained within a blind sac, is delusive. Similar appearances are produced by other structures, the nature of which is known, as the tube valve of *Floscularia*, the ciliated œsophagus of various Rotifers, and the vibratile funnels of the Nais.

WEISSE observed the expulsion of the egg in a mature specimen of *Floscularia ornata*. The germ-vesicle was still present; but traces of embryonic structures soon showed themselves, and ciliary movements, which gradually increased in energy, could be noticed within the egg at one extremity. Rupture of the egg occurred at this extremity on the fifth day after exclusion. The embryo, thus liberated, was about twice the length of its egg-covering, but very unlike the parent *Floscularia*. It moved slowly about in a worm-like manner, and displayed at its anterior end a circlet of cilia.

Other embryos distinctly exhibited two red eye-spots before their escape from the egg, which, in one case, did not take place till seven days after the act of deposition.

The author thinks it probable that in all *Rotifera*, except *Hydatina senta*, the development of the ovum is effected with comparative slowness.

ANNELIDA

BY

J. REAY GREENE, B.A.

A. *Works in Progress.*

Die Borstenwürmer (Annelida chaetopoda) nach systematischen und anatomischen Untersuchungen dargestellt. Von ERNST EHLERS. Erste Abtheilung. 4to (290 pages and 11 plates). Leipzig: Engelmann, 1864.

The work on the setigerous Annelids by Ehlers, of which the first part now lies before us, will henceforth be no less indispensable to students of this group than the well-known treatise of Audouin and Milne-Edwards. Like that monograph, though chiefly devoted to the fauna of a limited region, it enters also into many particulars touching the higher *Annelida* in general, their structure, habits, and systematic arrangement. After a short introduction on the distinctive features of the several animal forms referred to the type *Vermes* of modern naturalists, it proceeds to treat in a separate chapter of the characters common to the setigerous subclass, under the heads of (1) general organization, (2) conditions of life, and (3) classification. Then follows a general account of the first order, *Nereidea*, here divided into eleven families. More detailed notices of seven of these occupy the second and principal moiety of the work.

Twenty-five new species of *Nereidea*, from Quarnero and its neighbourhood, are described with great minuteness, as is likewise the *Phyllodoce lamelligera* of Johnston, found by Ehlers in the same district. Six of these species belong to new genera, and one to a new family—*Chrysopetalea*. Five new genera are also founded for the reception of species previously known. A few obscure or doubtful species not new to science are briefly noticed. To the detailed account of each new species afforded by the text a more concise definition, in small type, is prefixed. Similar definitions, but without descriptions, of the genera to which these species severally belong, and of various critical species referable to other genera, are given. All the families are defined, and, in addition, most of them are reviewed at considerable length, their genera enumerated, or even further

illustrated with the aid of tabular views in which their essential characters are curtly compared. This especially applies to the families *Hesionea* and *Syllidea*, which last includes the author's five new critical genera. The plates appended to this part refer chiefly to details of external anatomy; but internal structure is not neglected. Four families of *Nereidea*, besides the other orders of *Chætopoda*, remain for treatment in the succeeding divisions of the work.

B. *Separate Publications.*

Für Darwin. Von FRITZ MÜLLER. Leipzig: 1864. 8vo (92 pages and 67 woodcuts).

Die Insel Lussin und ihre Meeresfauna. Nach einem sechs-wöchentlichen Aufenthalte geschildert von Dr. ADOLF EDUARD GRUBE. 8vo (114 pages, plate, and map). Breslau: Ferdinand Hirt, 1864.

C. *Papers published in Journals.*

SCHNEIDER, A. Ueber die Muskeln der Würmer und ihre Bedeutung für das System. Reichert und Du Bois-Reymond's Archiv, 1864 (pp. 590-597).

CLAPAREDE, E. Glanures zootomiques parmi les Annélides de Port-Vendres. Mém. de la Soc. de Phys. et d'Hist. Nat. de Genève, tome xvii. seconde partie, 1864 (pp. 463-600, with eight plates).

BAIRD, W. Description of a new species of Annelide belonging to the family *Amphinomidae*. Linn. Trans. vol. xxiv. 1864 (pp. 449, 450, with a plate).

BAIRD, W. On a new species of British Annelides belonging to the family *Chætopteridae*. Ibid. (pp. 477-482, with a plate).

WILLIAMS, J. On a species of *Chætopterus* (*C. insignis*, Baird) from North Wales. [A letter addressed to Dr. Baird, and appended to the preceding paper.] Ibid. (pp. 483-485).

BAIRD, W. Description of a new British Annelide, belonging to the tribe *Rapacea* of Grube = *Annelida errantia* of Milne Edwards. Journ. of Proc. Linn. Soc.—Zoology, vol. viii. 1864 (pp. 8-10, with a plate).

BAIRD, W. Description of several new species and varieties of tubicolous Annelides = tribe *Limivora* of Grube, in the collection of the British Museum. Ibid. (pp. 10-22, with two plates).

KÖLLIKER, A. Kurzer Bericht über einige im Herbst 1864 an der Westküste von Schottland angestellte vergleichend-
1864. [VOL. I.] 2 q

anatomische Untersuchungen. Separat-Abdruck aus der Würzburg. naturwiss. Zeitschr. v. Band, 1864 (20 pages and a plate).

MÖRCH, O. Revisio critica Serpulidarum. Naturhistorisk Tidsskrift, 3rd ser. vol. ii. 1864 (with a plate).

QUATREFAGES, A. DE. Note sur la distribution géographique des Annélides. Compt. Rend. tome lix. No. 2, 1864 (pp. 170-174).

LANKESTER, E. R. The Anatomy of the Earthworm.—Part I. Quart. Journ. Micr. Sci. vol. iv. n. s. 1864 (pp. 258-268, with a plate).

BAUDELLOT, E. Observations sur la structure du système nerveux de la Clepsine. Compt. Rend. tome lix. No. 20, 1864 (pp. 825-828).

KUPFFER, C. Blutbereitende Organe bei den Rüsselegeln. Zeitschr. f. wiss. Zool. xiv. Band, 1864 (pp. 337-345 and a plate).

VAN BENEDEN, P. J., et HESSE, C. E. Recherches sur les Bdellodes (Hirudinées) et les Trématodes marins. Mém. de l'Acad. Roy. de Belgique, tome xxxiv. 1864. (The first moiety of this memoir, relating to the *Hirudinea*, numbers pp. 1-59 and pls. 1-4.) Four appendices have since been added. Two of these (each with a plate) treat of *Hirudinea*.

SEMPER, C. Reisebericht (Fortsetzung). Zeitschr. f. wiss. Zool. xiv. Band, 1864 (pp. 417-426, with a plate).

STIMPSON, W. Descriptions of new species of Marine *Invertebrata* from Puget Sound, collected by the naturalists of the North-west Boundary Commission. Proc. Phil. Acad. No. 3, 1864 (p. 159).

VAN BENEDEN and HESSE distinguish four groups of *Vermes*: Annélides, Nématoides, Cotylides, and Térétularides. Cotylides they subdivide into Polypodes (=Péripates), Bdellodes, Trématodes, and Cestodes.

SCHNEIDER, after a brief review of the chief modifications of the muscular system among the leading groups of *Vermes*, proposes to arrange these animals as follows:—

I. *Nematelminthes*:

Nematoidea; Chætognatha; Chætophora.

II. *Rhynchelminthes*:

Acanthocephala; Gephyrea.

III. *Platyelminthes* :

Trematoda; Hirudinea; Onychophora; Cestoidea; Dendrocoela; Rhabdocœla.

EHLERS, on the other hand, divides *Vermes* into these eight "classes":—

- | | |
|--|-----------------------------------|
| I. Cestoda, <i>Rud.</i> | V. Nemertina, <i>M. Schultze.</i> |
| II. Acanthocephala, <i>Rud.</i> | VI. Nematoda, <i>Rud.</i> |
| III. Trematoda, <i>Rud.</i> | VII. Gephyrea, <i>Qtrfgs.</i> |
| IV. Turbellaria, <i>Ehrbrg.s. str.</i> | VIII. Annelida, <i>Sav.</i> |

The *Annelida* he resolves into two subclasses—*Chætopoda* and *Discophora*. The *Chætopoda* include four orders—*Nereidea*, *Ariciea*, *Serpulea*, and *Lumbricina*. The first three of these correspond collectively to the order *Polychæta* of Grube, which is equivalent to the class *Annelida* of De Quatrefages.

GRUBE (*op. cit.* pp. 77–93) enumerates more than a hundred species of Annelids from the fauna of Lossini. These, with the exception of eight, all belong to the order *Polychæta*. The new forms, including two genera, have already been described by the author in a memoir communicated to Troschel's Archiv for 1863.

POLYCHÆTA.

The essays of De Quatrefages, Kölliker, and Claparède, cited in the above list, refer exclusively to the Annelids of this order.

According to DE QUATREFAGES, the principal genera, and even subgenera, of these Annelids are very cosmopolitan in their distribution; so that they do not restrict themselves to definite zoological regions, as do other groups of the animal kingdom. The species, however, are much more limited in their range, those of the same genus being often different even in contiguous stations. Not one species, according to De Quatrefages, is common to the shores of the Bay of Biscay and the Mediterranean. Seldom is the same species common to two continents, to two hemispheres, to the eastern and western seas of the same continent, &c. The few exceptions to this rule may readily be accounted for by the action of ocean-currents. In our study of the *Annelida* most remarkable for their peculiarities of organization, the grouping of the species into separate faunæ is best seen. It cannot be said that notable differences in complexity of structure, corresponding to those observed by Milne-Edwards among the *Crustacea*, mark the *Annelida* obtained from different latitudes. Lastly, the distribution of these animals is much influenced by the character of the coast—granitic and schistose coasts being most rich, while calcareous coasts are comparatively poor in Annelids.

KÖLLIKER notes the general distribution among the Annelids of the bacillar corpuscles described by Claparède and other observers. These bodies are always contained in cells of characteristic aspect, found usually in the branchiæ or locomotive appendages. Similar cells, without rod-like corpuscles or other specialized contents, have been observed by Kölliker in various species of *Polynoë*, in *Psammathe fusca*, and an undetermined Nereid. Cells containing corpuscles he describes from *Sphærodorum peripatus*, *Aonis foliosa*, and *Phyllodoce*, the cells or their contents presenting, in each case, slight peculiarities. But in no instance could a thread be detected within the corpuscles. Kölliker considers that these structures partake of the nature of unicellular glands.

The same investigator sums up the results of a number of observations on the sensory organs with which the integument is furnished in several *Polychæta*. These occur as variously formed hairs or papillæ, to which nerves are supplied—the modification of tactile function which each subserves being, in all probability, modified by its special position.

CLAPARÈDE contributes a memoir on the *Polychæta* of Port Vendres, situate at the foot of the Pyrenees, on the shores of the Mediterranean. He describes about thirty new species, five of which belong to as many genera. Amended diagnoses of several previously known genera are suggested. The author also touches on other genera and species hitherto imperfectly characterized or made the subject of controversy. All the Annelids described in this memoir are littoral. The author's researches, undertaken during the summer of 1863, were unhappily interrupted by illness. They form, nevertheless, a valuable contribution to the literature of the subject.

EHLERS distinguishes the following families of *Nereidea*:—

| | | |
|--------------------------|---------------|----------------|
| Amphinomea, Sav. | Alciopæa. | Lycoridae, Gr. |
| Chrysopetalea. | Hesionæa, Gr. | Nephtydeæ, Gr. |
| Aphroditea, Sav. s. str. | Syllideæ, Gr. | Glycerea, Gr. |
| Phyllodocea, Gr. s. str. | Eunicea, Gr. | |

The new family *Chrysopetalea* is thus characterized:—

Chrysopetalea, Ehlers. *Prestomium* conspicuously furnished with eyes and tactile appendages; the *peristomium* with tactile cirri; the *body-somites* with similar appendages; *palpi* on the back of each segment.

Besides his new genus, *Chrysopetalum*, Ehlers would refer to this family *Paleanotus* and *Bhawanina* of Schmarda. Here, also, he places (with a query) *Palmyra* (Sav.), which, with Kinberg, he excludes from the *Aphroditea*. Kinberg's division of the *Aphroditea* into six subfamilies (*Aphroditea*, *Iphionea*, *Polynoina*, *Acoëtea*, *Sigalionina*, and *Pholoidea*) he seems disposed

to accept. From *Phyllodocea* he removes *Alciope*, to constitute a distinct family including this genus and *Liocape* of Costa.

Both CLAPARÈDE and EHLERS notice at much length the extensive family of *Syllidæ*, whose numerous genera and species have tended not a little to perplex zoologists. Moreover agamogenesis, accompanied by polymorphism, has been proved to occur in several of these Annelids, the males and females of which differ alike from one another and the sexless forms. Claparède thinks it quite useless to introduce generic terms to designate the sexual individuals. The names *Polybostrichus*, Örsted (= *Diploceraæ*, Gr.), and *Sacconereis*, J. Müll., had acquired their right of citizenship before they were applied to the male sexual individuals and females of *Autolytus*. Thus considered, they should be retained, more especially as, in the genus *Autolytus*, the sexual individuals (above all, the males) frequently differ more from the agamic individuals than in the other genera. But it seems superfluous to devise new terms, as *Tetraglene* (Gr.), for sexual forms whose agamic origin (*Syllis*) is known. If a name were wanting for these individuals, that of *Ioida* (Johnston) would have the priority.

The fact that some *Syllidæ* are gamogenetic and others agamogenetic does not, according to Claparède, afford a fit basis for generic distinction. Generic and specific characters are best drawn from the sexless forms. The sexual individuals have a more simple intestinal canal, possess neither proboscis nor proventriculus, and their segments are often, perhaps always, provided with long hair-like setæ, not found on the protozooids.

Claparède entirely agrees with Krohn in considering that some of the agamogenetic *Syllidæ* give rise, by true gemmation, to sexual zooids, which originate between the last and penultimate segments (*Autolytus**, *Myrianida*). In most, however, sexual elements are formed in the posterior region of the body, including numerous segments. These afterwards separate from the anterior region by fission.

Claparède gives a synoptical table of the European genera of *Syllidæ* which he has himself observed, thirteen in number. In his brief diagnoses of these, he relies much on characters drawn from the pharyngeal armature, the value of which he further points out in the text. On the affinities of the exotic forms he does not venture to pronounce.

Ehlers, on the other hand, takes up the entire group of *Syllidæ*; and his investigations derive additional importance from the circumstance that they are quite independent of those

* See also a paper by A. Agassiz, "On alternate generation in Annelids, and the embryology of *Autolytus cornutus*." Bost. Journ. of Nat. Hist. vol. vii. No. III. 1862 (pp. 384-409, with 3 plates).

of Claparède. All the genera and species known to the author, from his own observations or the writings of others, are cited, with bibliographical references, and their systematic position is, at the same time, displayed. New species are described, and new genera established, while a critical survey is taken of the whole family.

FRITZ MÜLLER, in his illustrations of Darwin's theory, chiefly selected from the *Crustacea*, refers briefly to an Annelid from Desterro, and shows how, in the Serpuloids, the operculum may be formed from one of the branchial plumes, by a gradual, though direct, metamorphosis.

In accordance with the views of Philippi, BAIRD would attach considerable value to the characters furnished by the modifications of the operculum, as distinguishing the genera and species of *Serpulidæ*. This more especially applies to museum specimens, the shells of which will be found, in many cases, quite inadequate for purposes of systematic arrangement.

MÖRCH, who has paid particular attention to the *Vermetidæ*, adds some useful cautions on the same subject, and points out a number of curious analogies between the shelly tubes of these Mollusks and those of the *Serpulidæ*. Mörch gives a critical review of this family, describing one hundred and thirty-four species, of which several are new, and one new genus, *Phragmatopoma*, which would seem to represent *Serpula* among the family of *Hermellidæ*. His memoir does not allow of condensation.

Thus materials on all sides are being rapidly accumulated for a more precise terminology and nomenclature of the higher *Annelida*.

Remarks on known species and genera :—

Kölliker gives a list of thirteen *Polychæta* found in the Firth of Clyde, off the island of Cumbræ.

Glycera alba (R.); **Myrianida fasciata* (M.-E.); **Psammathe fusca* (Johnst.); *Chætopterus insignis* (Baird); *Aonis foliosa* (Aud., Edw.); **Sphaerodorum peripatus* (Gr.); *Ophelia aulogaster* (Gr.); *Travisia æstrioides* (Gr.); *Siphonostomum diplochaitos*; **S. plumosum* (Gr.); **Ammochares ottonis* (Gr.); **Phoronis hippocrepiæ* (Strethill Wright); **Scalibregma inflatum* (Rathke).

The species marked thus (*) are briefly noticed with reference to anatomical and histological characters.

In *Phoronis* Kölliker recognized red blood-corpuscles within the vessels, as asserted by Dyster and others. Colourless cells, exhibiting amœboid movements, together with yellowish granules, were also detected, but sparingly. At the hinder end of the body the dorsal and ventral vessels united with one another through numerous anastomoses. The entire surface of the animal, including the gills, was covered with cilia.

The work of Ehlers, being chiefly devoted to new species, takes less heed of those already known to naturalists. Incidental notices of many of these will be found, however, scattered through its pages. Besides his detailed account of the *Syllidæ*, the author gives a complete list, accompanied with bibliographical references, of the species of *Euphrosyne* and *Syllis*. Those of *Euphrosyne*, ten in number, are further discriminated by means of short definitions.

The following *Polychæta* are made the subject of comment by Claparède :—

Polyophthalmus pictus (De Q.) ; *Aphlebina* (De Q.), two species ; *Dasybranchus caducus* (Gr.) ; *Syllis gracilis* (Gr.) ; *Syllides pulliger* (= *Syllis pulligera*, Krohn) ; *Sphærosyllis hystrix* (Clap.) ; *S. pusilla* (= *Exogone*, sp., Duj.) ; *Odontosyllis fulgurans* (= *Syllis*, sp., Aud., Edw.) ; *Lumbriconereis unicornis* (Gr.) ; *Eunice harassii* (A., E.) ; *Micronereis variegata* (Clap.).

The first of these species is the *Nais picta* of Dujardin, whose account of this Annelid, hitherto the only one accessible to the student, contained several errors. Grube refers it to *Dero* ; Quatrefages, with whom Claparède is disposed to agree, to *Polyophthalmus*. Perhaps it should form a new genus. Claparède gives a long description of its structure, showing it to be an undoubted Polychætan, but, like *Thysanoplea luctuosa* (Schmidt) and *Drilidium* (Fr. Müller), tending to unite the characters of the two groups of setigerous worms.

Fam. TERESELLIDÆ.

Aphlebina. Hitherto little has been learned of this genus, the characters assigned it by De Quatrefages being only known from the short report of Milne-Edwards (Ann. d. Sci. Nat. 1844, Zool. p. 5). Claparède describes two species of *Aphlebina* from Port Vendres, which he names provisionally *A. hæmatodes* and *A. pallida*. The latter differs but slightly from *Polycirrus medusæ* (Gr.). Both are distinct from *P. trilobatus* (Sars).

Fam. CAPITELLIDÆ.

Claparède supports the opinion of Grube, that *Notomastus* and *Dasybranchus* should be united with *Capitella*, to form a separate family. He insists also that these two genera are sufficiently distinguished, and should not, as Grube suggests, be made into one.

Fam. SYLLIDÆ.

Amended diagnoses are given of the following genera : *Syllis* (Sav.) ; *Syllides* (Ærsted) ; *Sphærosyllis* (Clap.) ; *Sylline* (Gr.) ; *Odontosyllis* (Clap.) ; *Pterosyllis* (Clap.) ; and *Autolytus* (Gr.).

Fam. EUNICIDÆ.

Lumbriconereis unicornis (Gr.) is re-described. To *Zygolobus* (Gr.) Claparède would refer *L. edwardsii*, also *L. tingens* (Kieferstein). Two species of *Zygolobus* occurred at Port Vendres, the one identical with *Z. laurentianus* (Gr.), while the other may receive the name of *Z. grubianus*. *L. quadristriata* (Gr.), also found at Port Vendres, should probably be placed with these.

New species and genera :—

Ehlers gives lengthened descriptions of the following (all from Quarnero) :—

. AMPHINOMEA.—*Euphrosyne racemosa*.

CHRYSOPETALEA.—*Chrysopetalum fragile*.

APHRODITEA.—*Polynoë spinifera*; *P. pellucida*; *Sigalion limicola*.

PHYLLODOCEA.—*Phyllodoce vittata*; *P. lugens*; *Eudalia virens*; *E. volucris*; *E. obtecta*; *Eteone pterophora*.

HESIONEA.—*Orseis pulla*; *Podarke albocincta*; *P. viridescens*; *P. agilis*; *Periboëa longicirrata*.

SYLLIDEA.—*Syllis fiumensis*; *S. krohnii*; *S. pellucida*; *S. sexoculata*; *S. scabra*; *S.* (248–50)?; *Sphaerosyllis claparedii*; *Proceræa picta*; *Eurysyllis tuberculata*.

His new genera are thus defined :—

Chrysopetalum. Characters of the family. *Body* short, nearly as broad, with few segments; *parapodium* with one setigerous tuft; *prestomium* with three tactile appendages and two palpi; *peristomium* with four tactile cirri on either side.

In addition to his own *C. fragile*, Ehlers thinks *Palmyra debilis* (Grube) may also belong to this genus.

Orseis (Hesionea). *Body* compact, with very distinct segments; *prestomium* with five tactile cirri; *peristomium* with two tactile cirri on either side; *parapodium* unbranched, its dorsal and ventral cirri united; *posterior segment* with lateral processes and terminal anal cirri; anterior extremity of everted *proboscis* with a circlet of pointed papillæ.

Podarke (ibid.). *Body* compact, most of its segments marked with transverse bands; *prestomium* with five tactile cirri; *first three segments* without setigerous parapodia, but with tactile cirri; *parapodium* of each succeeding segment large, single, or with a second, superior, tubercular process; *setæ* (of the parapodium proper) compound, with pointed, knife-shaped appendages, those of the upper process simple, capillary; *dorsal cirrus* with basal joint, otherwise undivided; *ventral cirrus* always much shorter; *posterior segment* with lateral appendages and anal cirri or papillæ; *proboscis* destitute of papillæ.

Periboëa (ibid.). *Prestomium* with two filiform tactile cirri and a pair of longer and thicker tri-articulate palpi arising from its under surface; *peristomium* with three, second and third segments each with two pairs of cirri; *parapodium* very large, undivided, with pointed lips; *setæ* compound; *dorsal cirrus* very long, ventral cirrus shorter; *posterior segment* with anal cirri; anterior extremity of *proboscis* with a circlet of filiform papillæ.

Proceræa. Distinguished from other *Syllidea* without palpi by the long cirri which arise from its first three segments and from these only.

Eurysyllis may be known by the complete absence of these long cirri.

Five other critical genera of *Syllidea* are established by Ehlers, viz :—

Procome. Palpi; *peristomium* without setæ, but with more than two pairs of tactile cirri. Sp. *Syllis polycera* (Schmarda).

Exotokas. As *Procome*, but *peristomium* with only a single pair of tactile

cirri; three antennæ. Includes *Exogone kefersteinii* (Clap.) and *E. gemmifera* (Pag.). The closely allied *Microsyllis* has but two antennæ. *Exogone* proper differs from both these genera in possessing ventral cirri.

Isoyllis. Palpi; *peristomium* with setæ; three antennæ. Includes *Syllis maculosa* (M.-Edw.) and *S. armoricana* (Clap.).

Oophylax. As last, but with four antennæ. Includes *Exogone ærstedii* (Köll.) and *E. cirrata* (Köll.).

Eucerastes. No palpi; long cirri from all the segments; cirri thick, club-shaped. Sp. *Myrianida clavigera* (Schmarda).

Baird describes, as new species:—

Amphinome didymobranchiata (Island of Ascension).

Chætopterus insignis (British Seas).

Heteronereis signata (Cornish coast).

Fam. SERPULIDÆ.

Eupomatus boltoni (New Zealand).

Plagostegus cariniferus (New Zealand and C. B. S.). The Cape specimens constitute the variety termed *krausii*. Gray described the operculum of this Annelid as belonging to *Vermetus*. Also *P. latiligulatus* and *P. grayii* (Hab. of both unknown).

Cymospira tricornis (Djedda); *C. brachycera* (Australian coast); *C. macgillivrayi* (Fiji Islands).

Pomatostegus bowerbanki (Australia).

Serpula jukesii (Australia); *S. narconensis* (Narcon Island); *S. zeylandica* (New Zealand).

The new forms described by Claparède are as follows:—

Amphiglena. Branchiæ like those of *Sabella*; setigerous expansions supporting a double series of dissimilar setæ; ocelli on the first and second segments (= *Amphicora*, Leydig). *A. mediterranea* (described as *A. armandi* in the text; but see author's rectification at p. 588), the only species, has the sexes united.

Fabricia armandi. An amended definition of *Fabricia* is given.

Fam. ARICIIDÆ.

Aricia ærstedii; *Theodisca anserina*. *Theodisca* is re-defined.

Aonides, n. g. Head conical, with two rudimentary occipital antennæ; no buccal tentacles; feet (parapodia) biramous, the notopodium furnished with a plate-like lobe; anterior segments alone provided with ligulate branchiæ. Near *Aonis* (Sav.), but at once distinguished by wanting the unpaired cephalic tentacle of that genus, and by the accumulation of the branchiæ on the anterior segments. Also allied to *Clytia* (Gr.), which, however, is without occipital tentacles, and displays branchiæ along its entire length.

Aonides auricularis, the only species, is remarkable for the complex structure of its reproductive elements, which lie free within the cavity of the body. The ova are spherical, with distinct yelk, germ-vesicle, germ-spot, and a very thick chorion. The surface of this is elevated into numerous minute conical

papillæ, closely approximated so as to give it a shagreened aspect. The egg also presents an equatorial band or ring of bright circular spots, enclosing an equally transparent nucleus. On more careful inspection, each spot is seen as a flask-shaped ampulla, placed immediately beneath the chorion, its neck traversing that membrane. The ampullæ seem filled with a colourless or pale roseate liquid. One of these bodies when its neck is turned towards the observer, appears as a circular spot enclosing a second smaller one formed by the projection of the neck. The spermatozoa also are flask-shaped, with a very long tail. Their tissue is not homogeneous, but exhibits minute differences, like those which Valentin has found in bears and other mammals. The clear-coloured flask-shaped body shows in front a darker semilunar spot, besides a smaller posterior one. The neck is surmounted by a papilla, like the stopper of a bottle.

Fam. CAPITELLIDÆ.

Capitella filiformis (the first discovered Mediterranean species of the genus).

Notomastus sarsii; *N. benedeni*. A third, more obscure, species has also been met with. *Notomastus* has no branchiæ, and appears quite distinct from *Dasybranchus* (Gr.).

Fam. PHYLLODOCEIDÆ.

Oxydromus pallidus.

Fam. SYLLIDÆ.

Syllis armandi; *S. hexagonifera*; *S. simillima*; *S. aurita*; *Sphærosyllis tenuicirrata*; *Sylline brevipes*; *Odontosyllis dugesiana*; *Pterosyllis dorsigera*; *Autolytus rubrovittatus*; *A. roseus*; *A. scapularis*.

Spermossyllis, n. g. Frontal lobes very prominent, blended together, but separated by a median groove; pharynx quadrangular, crowned with a single shaft; antennæ unpaired, reduced to the condition of a mere granular protuberance; one pair of tentacular cirri; one pair of rudimentary dorsal cirri for each segment; no ventral cirri. Probably no alternate generation. Sp. *S. torulosa*.

Trypanosyllis, n. g. Frontal lobes very prominent, distinct throughout; pharynx quadrangular, armed, trepan-like, with a circlet of denticles along its anterior border; antennæ (three), tentacular and dorsal cirri, moniliform; ventral cirri pinnate. Alternate generation. Sexual individuals like those of *Syllis*. Sp. *T. krohnii*.

Polymastus, n. g. Frontal lobes distinct, but not projecting in advance of the frontal margin; pharynx quadrangular, without armature; antennæ three, shaped like trapezoidal lobes; parapodia pyriform; tentacular and dorsal cirri transformed into tubercles crowned with a sphere. On the back four longitudinal rows of spheres, similar to the dorsal cirri; no ventral cirri. Reproduction unknown. Sp. *P. paradoxus* (resembles *Eurysyllis* of Ehlers).

Fam. EUNICIDÆ.

Lysidice mahagoni; *Eunice tænia*. (This *Eunice* is remarkable for its size

among European Annelids, including from 750-800 segments, and measuring 65 centimetres long by 6-7 millimetres in breadth.)

Fam. APHRODITIDÆ.

Palmyra (palmyrides) portusveneris; 1. (*palmyropsis*) *evelinæ*. Ehlers would probably place these with *Chrysopetalum*.

OLIGOCHÆTA.

RAY LANKESTER's essay on the anatomy of *Lumbricus* supplies a long-felt need in this department of zootomy. The author's statements rest on his own observations, which, however, he seeks to compare with the results arrived at by d'Udekem, Hering, Claparède, Williams, and other investigators. In the present part the tegumentary, muscular, and digestive systems of the earth-worm are noticed. To these we shall direct attention when we come, next year, to record the concluding portions of the same paper.

HIRUDINEA.

BAUDELLOT describes the nervous system of *Clepsine*, which differs in some particulars from that of the medicinal leech. His account scarcely admits of condensation. The ganglionic chain of *Clepsine* presents twenty-one principal pairs of centres, in addition to three larger masses—a cerebral, a sub-œsophageal, and a caudal. Each of the two last results from the fusion of at least seven of the ordinary pairs; but the cerebral mass would seem to be the equivalent of one only. The lateral nerves which issue from the ganglia originate in such a manner as to call to mind the anterior and posterior roots of the spinal nerves among the *Vertebrata*. The peripheral extremities of these lateral nerves are connected with peculiar cellules to constitute a sort of plexus, which may possibly act the part of a visceral system.

The valvular structures (Klappen) occurring within the dorsal vessel of *Piscicola* and *Clepsine* do not, according to KUPFFER, subserve a mere mechanical function, but are true blood-transforming organs. The account which Kupffer gives of these bodies by no means wholly accords with the previously published observations of Leo and Leydig.

VAN BENEDEN and HESSE devote a memoir to the marine *Hirudinea* of the Bretagne coast, a few Belgian species being incidentally noticed. M. Hesse, residing at Brest, drew up most of the descriptions of species on which the work is based. A few others were supplied by Van Beneden, who added much connecting matter, and undertook the general treatment of the whole. An introduction is prefixed, while critical accounts of

the families and other groups under which the species fall, together with ample bibliographical citations, are interspersed.

The *Hirudinea* of the Brest coast are, in many cases, brilliantly coloured, and in this marked respect contrast with the more sombre species of the German ocean. This holds good when we compare different species of the same genus, or even different individuals of the same species.

Van Beneden divides the Bdellodes (*Hirudinea*) into three principal groups, including eight families, as follows :—

BDELLODA—

SCLEROBDELLAIREA : Gnatobdellina, Ichthyobdellina, Glossobdellina, Branchiobdellina, Heterobdellina.

HISTRIOBDELLAIREA : Astacobdellina, Histriobdellina.

MALACOBDELLAIREA : Malacobdellina.

According to our authors, there is this correlation between certain *Hirudinea* and their hosts—that those most complex in structure are found on the most highly organized animals. Thus *Gnatobdellina* infest mammals, *Pontobdella* fishes, *Histriobdella* crustaceans, and *Malacobdella* mollusks.

Remarks on known species and genera :—

Van Beneden and Hesse notice the following species :—

Pontobdella muricata; *Ichthyobdella anarrhica*; *I. hippoglossi*; *Histriobdella homari*; *Malacobdella grossa*. (All figured, except *Histriobdella homari*).

New genera and species :—

Van Beneden and Hesse describe thirteen new species, including five new genera. All the species are figured, with various anatomical details.

Fam. ICHTHYOBDELLIDÆ.

Dactylobdella, n. g. Characters of *Pontobdella*, except that the head is crowned with a double series of digitiform prolongations, which probably contribute to aid respiration. Sp. *D. musteli*.

Ophibdella, n. g. Cephalic sucker large, hood-shaped; digestive canal furnished with a proboscis; cutaneous folds smooth, distinct. Sp. *O. labracis*.

Ichthyobdella rhombi; *I. lusce*.

Fam. BRANCHIOBDELLIDÆ.

Branchellio rhombi.

Calliobdella, n. g. A sucker at each end of the body, the hinder one very large and simple; body divided into two regions, an oral and a postnuchal, the cutaneous rings of the latter supporting tubercles on either side. Sp. *C. lophii*; *C. punctata*; *C. striata*.

Hemibdella, n. g. Body cylindrical, with an anterior constriction as in the last genus; oral sucker small, distinct; anal sucker less so, with wrinkled margin, capable of contracting itself so as to act the part of a prehensile

organ; cocoons hemispheric, flattened on the side of attachment, covered with stiff curled hairs, and furnished with an extensive transparent border. Sp. *H. soleæ*.

Fam. HETEROBDELLIDÆ.

Heterobdella pallida; *H. scillii*.

Fam. HISTRIOBDELLIDÆ.

Saccobdella, n. g. Body rounded, presenting a cephalic enlargement and a median one which protects the sexual organs, and within which the entire caudal extremity can include itself by invagination. Two stalked, sheathing, posterior suckers. Sp. *S. nebalicæ*.

Fam. MALACOBDELLIDÆ.

Malacobdella cardii.

GEPHYREA.

SEMPER, among other anatomical notes, comments on some points of interest in the structure of *Thalassema* and *Sipunculus*. His remarks chiefly refer to the generative and vascular systems of these worms, and to the larval form *Actinotrocha*.

Semper also describes certain peculiar organs which he has found in the integument of a few *Sipunculi*, scattered over the general surface, but especially numerous towards the posterior end. Each consists of a rounded vesicle enclosing four smaller vesicles disposed around a central nerve. The nerve appears to terminate in a cellular expansion at the point of the vesicle, whence also four pairs of filamentous bands (muscular?) originate, and become lost among the smaller vesicles. Externally the larger vesicle supports a horny ring furnished with three teeth. Upon these bodies a tactile function probably depends. (*Op. cit.* pp. 419-421.)

New species :—

Phascolosomum exasperatum, Stimpson; *Sternaspis affinis*, St.

PERIPATUS.

We have already noticed the position assigned to *Peripatus* by Van Beneden. Schneider (*op. cit.* p. 593) states that the muscular system of this genus, both in minute structure and general arrangement, resembles that of the *Hirudinea*. Ehlers (*op. cit.* pp. 12-14), on the other hand, suggests affinities between *Peripatus* and the *Tardigrada*.

SAGITTA.

Ehlers (*op. cit.* p. 11) has no hesitation in referring *Sagitta* to the Nematoids. Schneider recognizes its near affinity to these worms, but would still retain for its reception the order *Chatognatha* (R. Leuck.).

HELMINTHES

BY

T. SPENCER COBBOLD, M.D., F.R.S.

A. *Works in Progress.*

Die menschlichen Parasiten und die von ihnen herrührenden Krankheiten. By Dr. RUDOLF LEUCKART. Leipsic and Heidelberg. Vol. I. Text. 8vo, with numerous woodcuts, pp. 766.

This admirable work has been issued in parts, commencing in 1862, the first volume being completed in July 1863. It is professedly only a "manual" for physicians and naturalists, but is, in point of fact, a most elaborate treatise abounding in minute anatomical details. The title-page announces that it contains 268 wood-engravings; this statement, however, is calculated to mislead, as many of the cuts occur over and over again. Thus, cuts 160, 187, 188 are the same, of *Distoma hepaticum*; cuts 31, 131, 132 representing a section of *Bothriocephalus latus*, are identical; and the like may be said of many others, including that of *Distoma lanceolatum*, which appears at least four times repeated (151, 158, 161, 199). Very nearly all the illustrations are from original sources.

The volume commences with a general account of the nature and structure of all kinds of parasites, dwelling more particularly on the origin, development, and life-history of the Helminths properly so called, the first division of the volume closing with a description of their clinical importance. •The bulk of the volume, nevertheless, is occupied with a detailed record of the natural history, development, and anatomical structure of those parasites which are more or less exclusively human; and in this series are included several kinds of Protozoa (Gregarinæ, Psorospermia, and Infusoria), as well as Leeches.

The author devotes 291 pages to the consideration of the Cestodes, of which he describes 10 human species. One of these is new to science (*Bothriocephalus cordatus*). In this connexion he dwells particularly on the development of the pork and beef measles, and shows conclusively that the so-called Raineyan corpuscles do not represent the early condition of

Cysticercus cellulosæ. Hessling appears to have anticipated Rainey in the discovery of these bodies, having found them in the heart of the sheep, ox, and roe (Siebold and Kölliker's Zeitschrift, Bd. v. S. 196, 1853). Leuckart regards them as sacs of Psorospermia. The formation of the *receptaculum capitis* and its contents are minutely described; also the development of the sexual organs of the mature *Tænia solium* and its contained eggs. In like manner the *Tænia mediocanellata* in all its life-stages is carefully considered—its specific characters, tendency to become monstrous, structure, development, and clinical importance being especially dwelt upon. Of the highest interest is Leuckart's account of the rearing of the measles of this species in the calf. He records three experiments—two in the body of the work and one in an appendix. The first experimental animal died, but the second recovered. In both instances a violent kind of leprosy followed the administration of the proglottides of *Tænia mediocanellata*, owing to the migration of the six-hooked brood in extraordinary numbers. He proposes to call this malady the "acute cestode tuberculosis." The third experiment seems, more properly, to belong to Mosler, and will be referred to below. In this instance the animal also perished. In any case, Leuckart has the chief merit in this connexion, and one cannot help admiring the very praiseworthy manner in which he is always careful to award to prior investigators their legitimate due. It is well known that Küchenmeister in the first instance, followed by Huber of Memmingen, and Schmidt of Frankfort, had previously hazarded correct opinions as to the true source of this tapeworm.

It must also be noted that our author gives very cogent reasons for rejecting Küchenmeister's opinion respecting the existence of separate kinds of *Echinococcus*-larvæ. The *Echinococcus scoleicipariens* and *altricipariens* are only modified forms of the same animal, the alleged differences as to size, character, and proportionate number of the cephalic hooks having reference merely to the degree of development of the particular specimens under observation. Leuckart confirms the previous investigations of Von Siebold, Haubner, and Küchenmeister as to the true source of these larvæ, and finds that the sexually mature tapeworm, or *Tænia echinococcus*, requires a period of seven weeks for its development from the scolex condition. He enters most minutely into the subject of hydatid-formation, and discusses fully the so-called exogenous, endogenous, and multi-ocular varieties; but perhaps the most interesting observations in this relation are those which specially refer to the separate *Echinococcus*-heads, the brood-capsules in which they are contained, and particularly also the phenomena of proliferation. All these differentiations are modified buds which proceed from the

"endocyst" or innermost granular layer of the maternal hydatid; but there are some points of dispute respecting their precise mode of origin. Leuckart gives a faithful *résumé* of the views of Von Siebold, Kuhl, Davaine, Huxley, and Naunyn (spelled Naumyn by our author), showing the various points in which he either differs or agrees with these several authors.

Especially noteworthy also is our author's account of the anatomy and early stages of larval development of *Bothriocephalus latus*. He confirms the statements of Von Siebold and Schubart as to the ciliated character of the embryo, but corrects Knoch in respect of several points connected both with the structure and phenomena exhibited by these minute organisms. Knoch had persuaded himself that he had succeeded in rearing young *Bothriocephali* in dogs from these ciliated embryos—that is to say, in a direct manner and without the intervention of any intermediate bearer. Leuckart successfully explains the causes which led Knoch to entertain so erroneous an opinion.

Second only to the interest attaching itself to the Cestodes is that which obtains in the case of the Trematodes. Here our author is both scrupulously minute and accurate, and has added much to our previous knowledge of the minute anatomy and mode of development of these creatures. He has not only shown that the eggs of *Distoma hepaticum* continue their development after their expulsion from the maternal body, but has succeeded in tracing the development of the embryo both within and without the chorion. In the free swimming condition, the embryo of the common fluke is a finely ciliated larva, obconical, truncated anteriorly, furnished with a small central cephalic proboscis and a cruciform eye-spot. Its total length is about $\frac{1}{190}$ of an inch. In like manner he describes the free embryo of *Distoma lanceolatum*, which is remarkably small, having a longitudinal diameter of about $\frac{1}{830}$ ". It is of a rounded form and ciliated only at the front part.

The volume abounds throughout with novel and interesting facts, the greater part of which result from the author's own personal researches. Without detriment to any one, it may be truly affirmed that in the department of human helminthology Rudolf Leuckart has no equal.

B. *Separate Publications.*

Entozoa: an Introduction to the study of Helminthology, with reference, more particularly, to the Internal Parasites of Man. By T. SPENCER COBBOLD, M.D., F.R.S. London, 1864. 8vo (508 pages, with 82 woodcuts and 21 plates).

This elementary treatise is the first original work on Helminths which has issued from the English press. It is profusely illustrated, some of the figures being coloured. It at-

tempts an *outline* of all that is known respecting the Entozoa and their allies. A considerable number of the drawings are from the pencil of Professor Busk, F.R.S.; others are from original sources by the author. All those figures which are copied, as well as quotations, have their sources fully indicated and acknowledged. The bibliography alone extends over 60 pages, yet comprises merely a record of all the more important memoirs which have appeared in the English language. The work, as a whole, is the result of many years' diligent labour in the field of Helminthology, and contains many facts hitherto unrecorded, some of which are believed to be of the highest practical value.

The author divides the work into three sections. Part I., or "Systematic Helminthology," comprises a general account of the habits, structure, development, affinities, distribution, and classification of the Entozoa and their allies. It extends over 141 pages. Part II., or "Special Helminthology," gives an outline of the anatomical peculiarities, origin, mode of development, and propagation of the entozoa infesting man, with a particular account of the injurious effects they produce, including a brief notice of the remedies employed in medical practice. This embraces 248 pages. Part III., or "Spurious Helminthology," offers a brief account of the internal parasites of man not belonging to the class of Helminths, together with notices of various animal and vegetable substances reputed to have come from the human body. This takes up 31 pages. The remainder of the treatise is occupied by the bibliography, outline of contents, description of plates, preface, and dedicatory letter to Mr. Busk*.

Helminthologische Studien und Beobachtungen. By Dr. FRIEDRICH MOSLER. Berlin, 1864. 8vo (pp. 89, with 2 coloured plates).

This pamphlet is chiefly interesting inasmuch as it carefully records the circumstances attending a successful feeding-experiment with the proglottides of *Tania mediocanellata*. It also briefly notices two negative results, one from the administration of the joints of *Tænia solium*, and the other from the employment of muscle-Trichinæ in this relation. In all three instances the experimental animal was a calf.

The author commences by pointing to the recognized resemblances existing between the "juvenile states of various measles" and the common tubercles found in the different viscera of man

* The author wishes to correct an error at p. 211, where the line no. 6 from the top should read thus:—"22 to 28 altogether, [*i. e.* 11 to 14] in each circular row." The introduction of the words and figures here given in brackets is essential to render the description of the specific characters of the species correct.

and animals. He quotes a lengthened passage from Leuckart (Ueber die Blasenbandwürmer und deren Entwicklung. Giessen, 1856, p. 43), in which the latter authority drew early and prominent attention to this resemblance, and supported his determinations by the sanction of his colleagues J. Vogel Wernher, and Bischoff. Dr. Mosler might as well have mentioned that in the passage he quotes Leuckart was recording the results he had obtained by feeding rabbits with the proglottides of *Tænia serrata*. It is impossible that the reader of Mosler's pamphlet should know this, unless, by chance, he had previously consulted Leuckart's memoir. The quotation having a special interest, we give a part of it:—

"The liver was in a similar condition to that described in the feeding-experiment with *Tænia crassicollis*, partly occupied with little white punctiform specks; only, in this case, the number of these comparatively larger formations was endless and might be estimated at several thousand. The surface of the liver (as also observed by Haubner and Küchenmeister in a similar instance) was precisely the same as in a miliary tuberculosis; so that any one ignorant of the experiments employed would inevitably have diagnosed the appearances in this sense."

Part of the original passage occurs in a foot-note, but the separate parts are here blended into one quotation. Dr. Mosler then passes on to speak more particularly of the specific differences between *Tænia solium* and *T. mediocanellata*. Here also he follows Leuckart closely. At page 8 he commences an interesting account of his successful experiment. "On the 10th of March (1863), at 3 p.m.," he says, "I introduced along with milk 100 ripe proglottides into the throat of a sound, well-formed calf which was about two and a half months old. The *Tæniæ* had been immersed in water seven days." The animal was carefully watched, and on the 13th of March fifty additional proglottides were administered. The calf "remained vigorous and apparently healthy until the 21st of March, when several morbid symptoms appeared, eleven days having elapsed since the first, and eight days since the second feeding." These symptoms eventually became so aggravated that the animal died on the 1st of April.

Much instruction may be gathered from the two very ably executed plates, affording, as they do, a much better notion of the general appearances presented by the larvæ than could possibly be obtained by mere description alone. The two drawings severally represent the external surface of the heart, and the same organ in section, several hundred cysticercus-vesicles being represented *in situ*. As only three weeks had elapsed since the first feeding-experiment, the individual vesicles were scarcely larger than an ordinary pin's head. Some of the viscera (as, for example, the liver and spleen) contained no cysticerci.

The rest of the pamphlet is occupied with an account of two new anthelmintics.

Darstellung der Lehre von den Trichinen, mit Rücksicht auf die dadurch gebotenen Vorsichtsmaassregeln, für Laien und Aerzte. By Dr. RUDOLF VIRCHOW. Berlin, 1864. 8vo (pp. 64, with five woodcuts and a coloured plate).

This *brochure*, as the title indicates, professes to be neither more nor less than a popular exposition of our knowledge of the origin and development of the *Trichina*, specially intended to suggest precautionary measures in view of the helminthiasis, or so-called fleshworm endemic disease, which results from the migration of the young in large numbers. As might naturally be expected from so distinguished an authority, it is a "statement" which may be perused with profit by most naturalists. It not only contains a brief *résumé* of the labours of helminthologists generally, in this relation, but also some account of the author's own experiences. Thus, referring to his original experiments, Virchow says (p. 11) :—

"In a dog to which I had administered encapsuled but living *Trichinæ* from the human body, I found, at the expiration of only three and a half days after the feeding, numerous free and well-formed *Trichinæ* in the intestine, which, moreover, had acquired perfect sexual development. I could recognize male and female animals, and in their bodies I found numerous eggs and spermatozoa. My first communications on this head were made at the meeting of the Society for Scientific Medicine at Berlin on the 1st of August, 1859 (*Deutsche Klinik*, 1859, S. 430; *Compt. Rend. de l'Acad. des Sciences*, tom. xlix. p. 660), and subsequently in my *Archives* (*Archiv für pathol. Anat. und Physiol.* Bd. xviii. S. 342). I showed, at the same time, that the capsule, in which the animal was found enclosed in the flesh, could be none other than an altered muscular fibre, a degenerated primitive fasciculus, and likewise that the animals must forcibly enter into the particular structural elements of the flesh."

We have quoted this passage with the especial view of fixing the date of this early *Trichina*-experiment, which was very soon confirmed in its results by the more extended researches of other investigators. No one has done more justice to other workers than Virchow himself, as may be shown by the multitudinous references with which his little pamphlet abounds. The accompanying plate, though rather coarse, gives a highly characteristic view of the muscle-*Trichina* in the living, non-encysted condition.

An Essay on Trichinosis or Fleshworm Disease, its Prevention and Cure. By JULIUS ALTHAUS, M.D., M.R.C.P. Lon-

don, published by Churchill. 8vo (pp. 34, with 11 woodcuts).

Although this ably written pamphlet apparently contains nothing original or new, it nevertheless offers an excellent summary of all that is known respecting the *Trichina*. As the object which the author appears to have in view is chiefly professional, it is perhaps unnecessary to do more, in this place, than testify to the general ability with which he has performed his task; nevertheless one cannot permit the notion to go forth unchallenged, that Virchow has "succeeded in showing, by experiments, the existence of alternate generation in *Trichina*" (p. 12). Dr. Althaus refers to the original experiments above mentioned (in our notice of Virchow's *brochure*), and adds, "These and other experiments of Virchow, which were confirmed by those of Leuckart, Claus, and others, have led to the conclusion that there exists alternate generation for *Trichina* as it does for *Cysticercus*." Dr. Althaus, at various places, follows Virchow very closely in the wording of his text; but we have not been able to satisfy ourselves that Virchow has been "led to the conclusion" above mentioned. At page 12 of his *brochure* Virchow writes as follows: "Es verhalten sich demnach die *Trichinen* in einer Beziehung ganz anders, als die Band- und Finnenwürmer. Sie brauchen nicht zweimal, sondern nur einmal genossen zu werden, um eine neue, den Körper durchwandernde Brut hervorzubringen." At page 12 also, in the English pamphlet, Dr. Althaus writes: "It thus appears that the danger which may accrue to man from *Trichina* is far greater than that with which he is threatened by *Cysticercus* and *Tænia*. While the latter require to be eaten on two several occasions, the former only requires to be eaten *once*, in order to produce a progeny which infects the whole system." In our opinion, the latter sentence should have been accompanied by inverted commas or by the final addition of Virchow's name within brackets. The same remark is applicable to other easily recognizable quotations with which Dr. Althaus's pamphlet abounds; moreover the "Essay" would not have been less valuable if the author had indicated more precisely the German sources whence he has obtained his information. Names are quoted abundantly; and why not, therefore, the works, memoirs, and communications of the several authorities referred to? In this respect, Virchow's *brochure* is quite a model for imitation. Lastly, we repeat our protest as to the notion of the existence of any "alternate generation" in *Trichina*, and almost feel disposed to request the author to have the kindness to explain to us what he means.

The publisher's part in the production of this *brochure* is sufficiently praiseworthy. In the Preface it is stated that the

"Essay is partly reprinted from the Medical Times and Gazette." It contains, however, important additions.

C. Papers published in Journals.

DIESING, K. M. Revision der Cephalocotyleen. Abtheilung: Paramecocotyleen. Sitzgsber. Akad. Wiss. Wien, 1864. Vorgelegt in der Sitzung d. k. Akad. der Wissench. vom 8 October 1863 (pp. 146).

DIESING, K. M. Revision der Cephalocotyleen. Abtheilung: Cyclocotyleen. Sitzgsber. Akad. Wiss. Wien, 1864. Vorgelegt in der Sitzung vom 5 November 1863 (pp. 74).

The author of the well-known 'Systema Helminthum' continues, at intervals, his admirable series of "Revisions," which were so auspiciously commenced in 1855. As these memoirs can be had separately, it may be useful to indicate very briefly their several titles and dates in English:—Revision of the Cercariæ; 1855. Corrections and additions to the foregoing; 1858 (pp. 54). Revision of the Myzelminths; section of Trematodes; 1858 (pp. 86, with two plates). Revision of the Myzelminths; section of the Leeches; 1859 (pp. 43). Supplement and emendations to the foregoing; 1859 (pp. 33). Revision of the Rhynogodea; 1859. Revision of the Nematodes; 1861 (pp. 141, with one plate). Revision of the Turbellaria; Rhabdocœlian section; 1862 (pp. 128).

In the rather artificial and complex system of classification initiated by Dr. Diesing, the Cephalocotylea constitute his fourth order of Helminths, and, without altering his original plan, as regards the orders themselves, he has introduced into the Revisions a variety of minor alterations affecting the sections, suborders, tribes, and genera. For example, in the case before us, he divides the Cephalocotylea (or those worms supporting suckers) into two sections, namely, the Paramecocotylea or those which have oblong pits, depressions, or cup-shaped discs, and the Cyclocotylea or those possessing circular suckers. The misfortune of this method is, that in the case of the Paramecocotylea it brings together, in one group, animals totally distinct from each other, such as Bothriocephali, Tetrarhynchi, and Pentastomata, whilst, on the other hand, the Teniæ are isolated from their allies to form the division termed Cyclocotylea. Disregarding the ambiguity and confusion of ideas which this artificial plan necessarily entails (in the minds of all who are accustomed to a strictly natural method), these Revisions are otherwise, and in many respects, extremely valuable. The Paramecocotylea embrace thirty-one genera, which are disposed by the author (and may therefore be tabulated) as follows:—

PARAMECOCOTYLEA.

Tribe A. PARAMECOCOTYLEA APROCTA.

Subtribe I. ATRYPANORHYNCHA.

Fam. 1. *Monobothria*.

Caryophyllæus, Monobothrium, Diporus.

Fam. 2. *Dibothria*.

Ligula, Schistocephalus, Dibothrium, Echinobothrium, Triænoporus, Amphicotyle.

Fam. 3. *Tetrabothria*.

Tetrabothrium, Anthobothrium, Amphoterocotyle, Polyonchobothrium, Tetracampus, Cyliodrophorus, Prosthecobothrium, Echeinebothrium, Onchobothrium, Phyllobothrium, Monorygma, Orygmatobothrium, Marsypocephalus, Calliobothrium.

Fam. 4. *Octobothria*.

Octobothrium.

Fam. 5. *Monosolenobothria*.

Disymphytobothrium.

Fam. 6. *Disolenobothria*.

Solenophorus.

Fam. 7. *Zygobothria*.

Zygobothrium.

Subtribe II. TRYPANORHYNCHA.

Fam. 8. *Dibothriorhyncha*.

Rhynchobothrium.

Fam. 9. *Tetrabothryorhyncha*.

Tetrarhynchobothrium, Syndesmobothrium.

Tribe B. PARAMECOCOTYLEA PROCTUCHA.

Fam. 10. *Hypobothria*.

Pentastomum.

It is hardly probable that Diesing's method will gain general acceptance; nevertheless, in justice to the author, we offer this bird's-eye view of his classification. Any analysis of the new genera here put forth is quite out of the question. It is worthy of remark, however, that in the 'Systema' our author gave 32 genera for the entire group (Cephalocotylea), whereas he now adduces 36 genera, of which the Cyclocotylea embrace only five. One or two marked improvements have also been introduced, such as the suppression of the genera Echinococcus, Cysticercus, Cœnurus, Piestocystis, and Scolex. These, of course, are larval forms which, as far as possible, he has wisely sought to allocate with their respective adult representatives. The author has also judiciously recognized the juvenile character of the so-called *Pentastoma denticulatum*, and has placed it in its appropriate relation to *P. tænioides*, describing, at the same time, 19 species as belonging to this genus. Leuckart, it may be remembered, gave

18 in his monograph published in 1860. Altogether, Dr. Karl Moritz Diesing describes 132 species of *Paramecocotylea*, and 137 species of *Cyclocotylea*, affording a total of 269 species referable to the order *Cephalocotylea*. Adopting our natural and more familiar nomenclature, the Cestodes or tapeworms may be said to number 250 known species, whilst the non-helminthic Pentastomes (which, properly speaking, are members of the Acarine family) comprise 19 distinct forms. The following synoptical table explains Diesing's arrangement of the five genera of the *Cyclocotylea* :—

CYCLOCOTYLEA.

Tribe A. CYCLOCOTYLEA APROCTA.

Fam. 11. *Tetracotylea*.

Tænia, *Sciadocephalus*, *Ephedrocephalus*, *Amphoteromorphus*.

Fam. 12. *Ocotocotylea*.

Peltidocotyle.

Tribe B. CYCLOCOTYLEA PROCTUCHA.

Fam. 13. *Hypocotylea*.

Here, again, one perceives the disadvantage of a uniformly artificial mode of classification, since Diesing, in order to make his subdivisions of the *Cyclocotylea* correspond with those of *Paramecocotylea*, is obliged, as it were, to have recourse to the assumption of the possible existence of a third *Cyclocotylean* family (*Hypocotylea*).

Apart from these unavoidable defects, it may be permitted us to remark, on the other hand, that the author's generic terms are often very happily chosen, whilst the specific characters are skilfully condensed within the narrowest possible limits. The amount of research, as shown by the extended and accurate series of references, is simply astonishing.

BASTIAN, H. C. On the Structure and Nature of the *Dracunculus*, or Guinea worm. Trans. Linn. Soc. vol. xxiv. 1864. Read Feb. 19, 1863. (With two plates, pp. 101–134.)

The author commences this valuable memoir with a tolerably full account of the various opinions entertained by the older writers respecting the natural history of the *Dracunculus*; following which, he gives an able criticism of the views enunciated by more recent authorities, amongst whom Busk and Carter are justly held to occupy the foremost place. The statements of Owen, Jacobson, Leblond, Wagner, and others are fairly considered. The materials at the author's disposal are referred to as follows :—"I have examined," he says, "six specimens of *Filaria medinensis*, all of which were taken from the lower extremities of a well-known surgeon of Bombay, by whom they were given to Dr. Harley," Professor of Medical Jurisprudence at University College, London.

The author's account of the manner in which these parasites

appear to have gained access to the surgeon's limbs is exceedingly interesting, and probably quite correct; but the memoir is especially valuable for the minute and accurately recorded anatomical details with which it abounds. Bastian has added a large number of facts quite new to helminthological science; and his demonstrations respecting the cæcal mode of termination of the alimentary tube in the young worms are highly instructive. Towards the close of the memoir he warmly supports the notion of an agamogenetic mode of reproduction in this species—a view which he implies to have been first suggested by Carter. Throughout this memoir the author has most carefully rendered to all their due, and he has omitted none of the previously recorded *data* which, in his view, were worthy of being noticed.

It only remains for us to observe that Dr. J. V. Carus has already given an abstract of Bastian's memoir in the *Nova Acta Acad. C. L. C. Germ. Nat. Cur.* vol. xxxi. Heft 4, Nr. 13, p. 125, 1864.

LUBBOCK, J. Notes on *Sphærulearia Bombi*. Natural History Review for April 1864 (pp. 265–271, with 6 woodcuts).

This brief paper may be regarded as an appendix to the author's lengthened memoir ("On *Sphærulearia bombi*") which appeared in the same excellent periodical for the year 1861. In the previous communication the author not only offered numerous structural details which were hitherto unknown, but he also recorded many new and interesting facts respecting the habits and economy of this parasite. He found the worm in seven different species of *Bombus*; and, taking collectively all the individual bees examined, he found 38 out of 105 to contain *Sphæruleariæ*. It appears that different bee-species vary in their liability to entertain the worm. Thus, in *Bombus terrestris* 19 out of 33 individuals were found infested (during the months of May and June), whilst in *B. leucorum* 7 only out of 21 contained the worm, in *B. muscorum* 1 only in 16, and in *B. hortorum* 1 in 13. The numbers infested also vary according to the time of year; for, in his recent paper, Mr. Lubbock observes that "out of 19 bees examined in the month of December only 4 were attacked, whereas I found," he says, "*Sphæruleariæ* in 9 out of 25 specimens dissected in March."

The author in his previous memoir throws much light upon the true zoological position of the genus *Sphærulearia*; but perhaps the most important facts are those which relate to his discovery of the presumed male. Considering that he ascertained the female to be 28,000 times as large as her supposed mate, it is not surprising that Lubbock hesitated to pronounce definitely regarding the sexes: however, it would seem that his original opinion was correct; for not only was this legitimately so-called male found attached "at one end of the female in *every* specimen", examined, but Lubbock's later researches enabled him to discove

males and females united at a much earlier stage of their development. In one case the young female, "far from being the comparatively gigantic creature which she afterwards becomes, was actually shorter, though thicker, than the male, being only $\frac{1}{10}$ of an inch from one end to the other."

HARLEY, J. On the endemic Hæmaturia of the Cape of Good Hope (caused by the *Distoma hæmatobium*). Medico-Chirurgical Transactions, vol. xvii. Read Jan. 26, 1864. (18 pages with 2 plates.)

Apart from its purely professional claims, this communication has an especial interest for the helminthologist. The author is undoubtedly entitled to the credit of having been the first to discover the presence of the eggs of *Distoma hæmatobium* in the urine of persons resident in this country, and he has also been the first to point out the parasitic origin of the hæmaturia of the Cape. Hitherto the parasite (*Bilharzia hæmatobium*, Cobbold) was known only in Ægypt and North-eastern Africa, but it is now tolerably clear that it exists also at the Cape, at Natal, and in the Mauritius. Probably it will be found more or less abundant throughout the African continent.

The author gives numerous details respecting the ova and their yelk-contents. The ciliated embryo is also very fully described, although, in most of the facts recorded, he appears to have been anticipated by the prior researches of Leuckart. As regards the adult parasite, the author ventures to suggest that we have here to deal with a new species, for which he proposes the title of *Bilharzia capensis*. Presumed differences in the structure of the larvæ of this fluke (as contrasted with the characters of the embryos of *B. hæmatobium*) constitute the only ground on which this specific distinction is made. At page 8 the author remarks: "Bilharz and Griesinger, followed by Derseble [*sic*], Kückenmeister [*sic*], and Leuchart [*sic*], have described this parasite." Here, unfortunately, besides several obvious typographical errors, there is one serious oversight which must be corrected. The false name Derseble is a misprint for derselbe (= *Idem*, or *the same author*). Dr. Harley, in copying the reference from Leuckart (Die menschlichen Parasiten, vol. i. p. 617), has supposed Bilharz's second paper (Wiener Medic. Wochenschrift, 1856) to be that of an independent author rejoicing in the name of Derselbe!

It only remains for us to observe that the accompanying illustrations are excellently drawn from nature. As several other papers on Entozoa have emanated from this country under the name of "Harley," our continental readers will thank us for informing them that the writer of this paper is not the author of the memoir on Pentastoma which appeared in the Zoological Society's 'Proceedings' for the year 1857.

RALPH, T. S. On the Parasitic Origin of Pleuropneumonia in Cattle (read 2nd Dec. 1864, and dated from Kew, Melbourne, Sept. 23rd, 1864). Australian Medical Journal for Jan. 1865 (pp. 1-10, with a coloured plate).

The author carefully records the results obtained from an extensive series of microscopical examinations of the organs of animals dying of the disease above mentioned, and, from the quantity and variety of helminthic organisms encountered, he has persuaded himself that pleuropneumonia is of parasitic origin. The facts recorded are certainly not devoid of interest, but there are many statements in the paper the meaning of which is rather obscure. Thus (at p. 3), in a foot-note, he says, "In applying the term *encysting* to Distoma, I wish to convey the idea that an ovum of Distoma passes into a cystic condition in place of developing as an animal." Necessarily the author is at a serious disadvantage in not having ready access to recent helminthological writings; yet, on the other hand, one does not understand from what source he can have learnt that Leuckart refers *Linguatula ferox* or *Pentastoma denticulatum* "to some condition of a cestoid worm" (p. 6). Apart from these defects, there is much that is praiseworthy. The author figures an ovum of a Distoma found in a cyst in the lung; and from what is written in the text (in paragraphs 5, 8, 9, and 13) we may infer that the egg in question had been obtained from an ox or cow. The greater part of the paper claims the interest of the veterinary pathologist rather than that of the helminthologist.

COBBOLD, T. S. Note on *Cænurus*. Journal of the Proc. Linn. Soc. viii. pp. 22-24 (with a woodcut), 1864.

In this brief paper the author describes a form of *Cænurus* taken from the viscera of an American squirrel, and expresses his belief in the existence of several kinds of *Cænuri*. He supports his view by referring to previously published cases, where *Cænuri* have been described as occurring in the viscera and soft parts of various animals; referring, more particularly, to the writings of Rose, Numan (Over den Veelkop-blaasworm der Hersenen), and Leuckart.

This paper has been reprinted in the Quarterly Journ. of Microscopical Science for January (New Series, No. xvii. p. 929) 1865.

WEDL, C. Ueber ein Pentastom einer Löwinn. Sitzgsber. Akad. Wiss. Wien, 1864. Vorgelegt in der Sitzung der Akad. der Wissenschaften am 12 Nov. 1863. (Reprint, with one plate, pp. 1-8. Vienna, 1864.)

This communication contains a detailed account of the anatomical characters presented by an apparently new species of *Pentastoma*, great numbers of which were discovered by Prof. Bruckmüller in the body of a lioness. The parasite was present in the omentum and mesentery, being more especially abundant

in the liver and spleen, where it was also encysted. The author proposes to call this species *Pentastoma leonis*. The largest females measure three-fourths of an inch in length, the males being rather smaller.

CRISP, E. On *Filaria gracilis* in a Monkey. Proc. Zool. Soc. 1864, pp. 16, 17.

In this brief paper Dr. Crisp states that "with the exception of some Echinococci," he had "not before found an entozoon in nearly 200 apes and monkeys" that he had examined. It is with characteristic honesty added, however, "that in many instances entozoa were not carefully looked for."

ALTHAUS, J. On Trichina Disease, its Prevention and Cure. Medical Times and Gazette for 1864, vol. i. pp. 362, 390.

ALTHAUS, J. On a suspected case of Trichinosis. Med. Times and Gaz. for 1864, vol. ii. p. 161.

THUDICHUM, J. L. W. Recent outbreaks of Flesh-worm Disease, or Trichiniasis, in Germany. British Medical Journal for Jan. 1864.

KESTNER, Dr. Etude sur le *Trichina spiralis*. Gaz. Méd. de Paris, 1864, p. 560.

RORIE, J. Note on *Trichina spiralis*. Lancet for Feb. 27, 1864.

GREENHOW, E. H. Note on several specimens of *Tania mediocanellata*. Report of Path. Soc. in Med. Times & Gaz. for Dec. 17, 1864, p. 665.

GREENHOW, E. H. Case of two examples of *Tania mediocanellata* in a boy four years old. Lancet for Jan. 1864.

VINEN, E. H. On a case of Tapeworm (*Tania mediocanellata*). Lancet for May 28, 1864.

SÉGALAS. *Tania solium* rendu vivant par l'Urètre. Rapport sur une observation de M. Jobert. Gaz. Méd. de Paris, 1864, p. 259.

CRISP, E. Note on *Oxyuris vermicularis*. Report of Path. Soc. in Med. Times & Gaz. for April 16, 1864, p. 437.

CRISP, E. Note on *Strongylus filaria* in the lungs of the lamb and calf. Ibid.

COLIN, G. Mémoire sur le développement et la migration des sclérostomes chez les solipèdes. Recueil de Méd. Vétérinaire, 1864, p. 686. (Les conclusions, Gaz. Méd. de Paris, 1864, p. 412.)

LEGROS. Affection vermineuse (*Spiroptera nosuta*, Rud.) chez les Gallinacés. Gaz. Méd. de Paris, 1864, p. 296.

SCHWAITZER, F. Ein Eingeweidewurm (*Filaria labiata*) am Herzen einer *Ciconia nigra*. Journal für Ornithologie, 1864, pp. 398, 399.

ECHINODERMATA

BY

J. REAY GREENE, B.A.

AGASSIZ, A. On the Embryology of Echinoderms. Mem. Amer. Acad. vol. ix. 1864 (pp. 30, with four plates).

GRAY, J. E. Notice of a portion of a new form of animal (*Myriosteon Higginsii*), probably indicating a new group of *Echinodermata*. Proc. Zool. Soc. 1864, April 12 (pp. 163-166, with woodcuts).

GRUBE, A. E. Die Insel Lussin und ihre Meeresfauna. Breslau, 1864, 8vo (pp. 98-106).

JEFFREYS, J. G. Remarks on *Stilifer*, a genus of quasiparasitic Mollusks; with particulars of the European species *S. turtoni*. Ann. & Mag. Nat. Hist. vol. xiv. ser. 3, 1864, November (pp. 321-334).

WRIGHT, T. A monograph on the British Fossil *Echinodermata* from the cretaceous formations. Vol. i. Part 1 (pp. 64, and 11 plates). London, 1864. (Issued by the Palæontographical Society for 1862.)

WRIGHT (pp. 15-18) defines the class *Echinodermata* and its orders, of which he admits eight. But his definitions want scientific accuracy and completeness, and are not such as might have been expected from an accomplished palæontologist, writing in 1864. He still retains, as an order of this class, the *Sipunculoidea*, which, as every anatomist knows, possess none of the positive zoological characters by which the true *Echinodermata* are distinguished.

GRUBE enumerates thirty species of Echinoderms found by him around Lussin. None of these are new.

Here reference may be made to the *résumé* which JEFFREYS has given of the literature of the genus *Stilifer*, with a complete list of its species, and a description, from his own observations, of the external characters and habits of *S. turtoni*. These mollusks are found on the integument of *Echini* and starfishes from various parts of the globe. One species, *S. acicula* (= *Eulima vitrea*, A. Adams), is eaten by *Holothuriæ*. Jeffreys does not regard *Stilifer* as a true parasite, nor yet again as an epizöic

organism deriving its food from the environment, but rather considers that it holds an intermediate relation to its host, on the semifluid excretions of which it may be presumed to subsist. This opinion, however, is by no means proven. Jeffreys has also observed that, while both *Montacuta substriata* and *S. turtoni* infest *Echini*, the former always chooses the oral, the latter the anal region of the shell for its abode.

Under the name of *Myriosteon higginsii*, Dr. Gray describes an anomalous fragment which, he thinks, "may indicate a new group of radiated animals, nearly allied to *Asterias*," and, in any case, a new family, *Myriosteidae*. The same specimen, it had been previously suggested, might represent the tail of a ray, the shell of a gigantic Foraminifer, or the coral of a Polyzoön. In truth, the proper materials for its determination seem wanting, but a further examination of its microscopic characters, with the aid of re-agents, would certainly be desirable.

A. AGASSIZ describes the development of various Echinoids, Ophiurans, and Holothurids, comparing the early stages of their life-history with those of *Asteracanthion*. He thus arrives at the conclusion that, in all Echinoderms, the young commences its existence under the form of an open spiral star. Hence, notwithstanding what J. Müller has said, the apparent bilateral symmetry of many of these animals is, according to our author, delusive, and their real plan of structure conforms to a radiate pattern, as already set forth by Louis Agassiz, in the third and fourth volumes of his 'Contributions.'

CRINOIDEA.

PEACH, C. W. On the occurrence of the "Rosy Feather Star" (*Comatula rosacea*) on the Eastern Shores of Scotland, especially on that of Caithness. Proc. Roy. Phys. Soc. Edinb. Session 1862-63* (pp. 81-83).

Grube cites *Alecto europæa*, Leach (*Comatula mediterranea*, Lam.), in his fauna of Lossini (p. 103).

Peach records the capture of *Comatula rosacea* on the eastern coast of Scotland, where it appears to be much rarer than on the Atlantic shores of Britain.

The question, now under discussion, whether two, or even three, species of *Comatula* frequent the British coasts requires, it need hardly be said, the careful examination of specimens from as many localities as possible.

* Published in November 1864.

OPHIURIDEA.

NORMAN, A.M. On the Morphology of the *Ophiuroidea*. Rep. Brit. Assoc. Newcastle, 1863, Trans. of the Sections (p. 106).
A short abstract.

Norman thinks that certain points in the skeleton of the *Ophiuridea*, hitherto little noticed, will be found valuable in the discrimination of species. These, we presume, he will indicate in a future paper. He enumerates six species new to the British fauna, namely:—

Ophiura sarsii (Lütken); *O. squamosa* (Lütken); *O. affinis* (Lütken; syn. of *O. normanni*, Hodge); *Amphiura chiajii* (Forbes); *Ophiopeltis securigera* (Düben & Koren); *Asteronyx loveni* (M. & T.).

Grube notices *Ophiopsila aranea* (Heller), *Ophiura albida* (Forbes), and *Ophioderma longicauda* (M. & T.), besides citing five other species of this order from Lossini.

ASTERIDEA.

AGASSIZ, A. On the Embryology of *Asteracanthion berylinus* Ag. and a species allied to *A. rubens* M. T. *A. pallidus*, Ag. Proc. Amer. Acad. April 14, 1863 (pp. 1-8, with a folding plate).

SARS, M. Om en ny Art *Brachiolaria*. Forhandlinger i Videnskabs-Selskabet i Christiania, Aar 1863 (pp. 126-137).

AGASSIZ describes the early development of the "larva" of *Asteracanthion berylinus*, which he raised from the egg by means of artificial fecundation. He observed the disappearance of the germ-vesicle and germ-spot, the subsequent segmentation of the ovum, the formation of the blastoderm, of the alimentary canal, and of the ambulacral-vascular rudiments. The alimentary canal commences as a diverticulum inwards, the first-formed opening of which eventually becomes the anus, though for a time it acts the part both of an ingestive and egestive orifice. This diverticulum lengthens, till, reaching the opposite pole, it joins the oral depression. The entire canal now divides into gullet, stomach, and intestine.

While yet the alimentary canal is but half the length of the larva, the ambulacral rudiments appear as two small pouches developed laterally from its inner, cæcal extremity. They soon become hollow bodies, quite distinct from the digestive cavity and from one another. Hence these larvæ would probably have assumed the brachiolarian type, whose evolution our author was enabled to trace in the case of *A. pallidus*. His observations on this species well serve to complete those on *A. berylinus*, as they commenced with specimens in which the two distinct rudiments

of the ambulacral system had just made their appearance. The larvæ of these starfishes are sufficiently distinct in aspect, so that the author is confident he has avoided such errors as might have accrued from confusion of species; moreover the spawning-season of *A. berylinus* is very short, and takes place at least three weeks later than that of *A. pallidus*.

The larva of *A. pallidus* is a well-marked Brachiolaria, having, in addition to the ordinary vibratile fringes and bands with their long tentaculiform processes, "three small heavy appendages, surmounted by short warts." These brachiolar appendages are supplied with tubular extensions from the ambulacral system. Of the two rudiments of this system which appear while as yet the larva is destitute of appendages, one, invariably the left, gives rise to a prolongation opening externally as the water-pore. At a later period the two rudiments "extend to the extremity of the digestive cavity, and towards one another, beyond the mouth, where they unite, forming a Y-shaped tube." "On these water-tubes is developed the starfish—one of the water-tubes (the one with the water-pore) developing the actinal [oral] side and the tentacles, the other developing the spines and the abactinal area. These opposite parts of the starfish are open pentagonal spiral surfaces, not in the same plane, but making nearly a right angle with one another. The water-pore becomes the madreporic body. The open pentagons do not close till after the starfish has absorbed the whole of the larva. The complicated system of arms and the whole of the Brachiolaria is absorbed by the starfish, which is not separated from the larval stock, as seems to be the case in Bipinnaria according to Müller's statements."

"The arms of the star-fish are broad and short in the young. The suckers are pointed, and arranged only in two rows. The disk is developed only later. The odd terminal tentacle has an eye at its base, and never develops a disk. The abactinal surface is very arched. The spines are arranged in regular rows, and the plates remind us of the arrangement of plates of Crinoids. The anus opens near the edge of the disk on the lower side. The madreporic body also is situated on the edge."

The above account "is intended to appear in full, with many plates, in the fifth volume of the 'Contributions to the Natural History of the United States,' of Prof. Agassiz."

SARS has met with a new *Brachiolaria*, the similarity of which to *Bipinnaria*, both in structure and mode of development, is particularly striking. At the same time he points out the distinctions between the two forms, his statements on this subject essentially according with those of A. Agassiz.

Sars has also observed that the characteristic appendages of Brachiolaria act as organs of attachment. He compares them

to the larval feet of *Echinaster sanguinolentus* and *Asteracanthion mülleri*. A like view of their nature had previously, it is true, been expressed by Müller himself*.

These investigations of Sars and A. Agassiz are of importance, since they not only constitute positive additions to our knowledge, but enable us also to confirm the conjectures of previous observers as to the mutual relations of the different modes of development which occur among the *Asteridea*. No previous account had been given of the earliest stages in the life-history of Bipinnaria or Brachiolaria, nor had any one of these "larvæ" been referred to its particular species of starfish.

In this order of *Echinodermata*, the protozoid ("larva," "larval zoid," "pseudembryo"), or immediate product into which the fecundated ovum evolves itself, appears under two strongly contrasted forms. The first is well known as Bipinnaria. The second is exhibited by the young of *Echinaster*, and of some species of *Asteracanthion*. Bipinnaria, to an extraordinary degree, seems independent of the Echinoderm-disk which it produces, while *Echinaster* is so related to its young that the very existence of a distinct "larval zoid" has been questioned, the development of this starfish being likened to the metamorphosis which prevails among the ordinary marine *Invertebrata*†.

Now these dissimilar forms are plainly connected by Brachiolaria, which, albeit its close resemblance, both in structure and habit, to Bipinnaria, agrees with the young of *Echinaster* (1) in its prehensile appendages, and (2) in the circumstance that it does not detach itself as a separate zoid from the young Echinoderm, but is wholly absorbed or disappears. The intermediate nature of Brachiolaria is rendered still more clear when we consider the time of appearance and relative bulk of the Echinoderm-disk which it evolves. Both in Brachiolaria and the young *Echinaster*, a cavity homologous to the ciliated sac of Bipinnaria exists; and this, though a structure of the protozoid, is nevertheless brought into direct connexion with the rudimentary ambulacral system. And in all three forms of "larvæ," the axis of development of the Echinoderm-disk is in a different plane from that of the protozoid.

Further, it is interesting to note that Sars, the discoverer of Bipinnaria, and the first careful describer of the life-history of *Echinaster*, has also, without any aid from other observers, been enabled to demonstrate the intermediate method of development occurring in Brachiolaria; while the independent investigations of A. Agassiz not only accord with his, but supply also some very desirable details touching the precise nature and relations of the same organism.

Lastly, the young of *Pteraster militaris*, as described by Koren and Danielsen, though akin to that of *Echinaster* in its non-oceanic habit and develop-

* Ueber den allgemeinen Plan in der Entwicklung der Echinodermen. Berlin, 1853 (p. 12).

† A useful summary of our knowledge of the development of the *Asteridea*, with an expression of the author's views, and ample references to original sources of information, is given by Wyville Thomson, in Nat. Hist. Rev. 1863 (pp. 395-415). This article, together with Huxley's Report on Müller's researches, in Ann. & Mag. Nat. Hist. July 1851 (pp. 1-19), may be consulted for those details into which it does not become us here to enter.

ment within a marsupium, differs therefrom and reminds us of *Bipinnaria* in its want of brachiolar appendages, and in possessing a distinct alimentary canal. The first stages in the embryogenesis of this form have not yet been observed; but it seems probable that the Echinoderm-disk appears at an earlier period than in *Echinaster*, and, to a still greater degree, predominates over the protozoid.

If, as Wyville Thomson hints, the development of *Asteracanthion glacialis*, observed by Busch, takes place after the manner of *Pteraster*, then the four modes of embryogenesis to which we have referred are, in all probability, exemplified by the species of a single genus, *Asteracanthion*. Which of these four modes is the most frequent is a question we cannot decide, since no one has yet determined what are those species of starfish which produce the several kinds of *Bipinnaria*. *Brachiolaria*, however, leads from this form to *Echinaster*; *Echinaster*, or rather its protozoid, to *Pteraster*, and this, again, to *Bipinnaria*.

| | | | | |
|--|---|--|---|--|
| With special swimming-appendages. An alimentary canal. | { | BIPINNARIA.
(A ciliated sac). | { | Prehensile appendages. |
| | | BRACHIOLARIA.
(Two ambulacral rudiments.) | | |
| No special swimming appendages. | { | ECHINASTER.
(No alimentary canal). | { | No prehensile appendages. An alimentary canal. |
| | | PTERASTER.
(No ciliated sac). | | |
| | | BIPINNARIA. | | |

Or, starting from *Echinaster*, we may proceed in two directions, either of which conducts to *Bipinnaria*; and thus, so to speak, we complete the circle of "larval zooids" among the *Asteridea*. Future researches will, doubtless, bring to light other forms tending still further to complete the series; and of this kind, it may be conjectured, are those obscure "larvæ" of whose life-history but imperfect glimpses have been obtained. It is possible that some of the extinct *Asteridea* presented similar transitional conditions.

Putting aside, for want of sufficient knowledge, Müller's *Tornaria* and two curious oceanic Astero-zooids observed by the same naturalist at Nice in 1849, the one, his so-called "vermiform larva," the other, a ciliated medusiform body supposed to be the young of *Asteracanthion tenuispinosum*, we may sum up the results of past observations on the embryogenesis of the *Asteridea* as follows:—

A. The ovum is developed into an oceanic protozoid, furnished with special swimming-appendages. The structures of the protozoid are at first wholly independent of those of the deuterozooid to which, by a process intermediate between gemmation and ordinary metamorphosis, it subsequently gives rise. The protozoid possesses an alimentary canal, the stomach and intestine of which are appropriated by the deuterozooid.

1. The structures of the protozoid are cast off by the deuterozooid, and may even maintain for a time an independent vitality. The ambulacral ring of the deuterozooid commences as a rosette of five cræca, which soon unite with one another (*Bipinnaria*).

2. The structures of the protozoid are entirely absorbed by those of the

deuterozoid, which appear sooner than in *Bipinnaria*, and assume a greater relative magnitude. The ambulacral system has two distinct rudiments, and its five cæca remain distant from each other till a comparatively late period. The homologue of the ciliated sac is in connexion with three characteristic prehensile appendages (Brachiolaria).

B. The ovum is developed within a "marsupium," and gives rise to a protozoid destitute of special swimming-appendages. The deuterozoid does not appear as a distinct bud, and its structures at an early period predominate over those of the protozoid, which soon wither away or are absorbed.

1. The marsupium is extemporized by the infolding of the rays over the oral region of the adult starfish. The protozoid has no alimentary canal, but is furnished with prehensile appendages corresponding to those of Brachiolaria (young of *Echinaster sanguinolentus*, *Asteracanthion mülleri*, *A. violaceum*, and an American species observed by Desor and Agassiz).

2. The marsupium consists of a distinct membranous fold, supported by the spines over the dorsal surface of the adult. The protozoid possesses an alimentary canal, no part of which would seem to be appropriated by the deuterozoid (young of *Pteraster militaris*, perhaps also of *Asteracanthion glaciale*).

The position of the anus next to the mouth is an eminently crinoidal feature of the young *A. pallidum*, as is likewise the arrangement of its dorsal plates; while its arched disk and tall spines "remind us of the Echinoids." A. Agassiz notes also the constant appearance of the madreporic rudiment in the same situation, and consequently the definite relations of the madreporic body to the axes of the adult starfish. The position of this structure on the oral surface of the embryonic disk "is a feature of the Ophiurans." Here our author might have referred to the marginal position of the madreporic body in Asbjørnsen's singular genus *Brissinga*, which unites the characters of three orders of starfishes—in its ambulacral grooves, spinous arms affixed to a distinct central disk, and reproductive organs brachial in position like those of *Comatula*.

With regard to grade of development, A. Agassiz concludes, on embryological grounds, that Asterids with suckers rank above those with tentaculiform feet; those with four rows of suckers, above those with only two; those with complicated spines and plates, above those with smooth arms; and, lastly, those with elongated arms, above starfishes whose outline is pentagonal.

The seven species of Asterids found by Grube (pp. 105 & 106) at Lossini are well-known Mediterranean forms.

ECHINIDEA.

AGASSIZ, A. List of the Echinoderms sent to different Institutions in Exchange for other Specimens, with Annotations. Bulletin (No. 2) of the Museum of Comparative Zoology. Boston, 1863 (pp. 17-28).

FISCHER, P. Note sur les perforations de l'*Echinus lividus* (Lamk.). Ann. d. Sci. Nat. V^e sér. Zool. tom. i. 1864 (pp. 321-332).

THOMSON, WY. On the Embryology of the *Echinodermata* (VI.—The Embryogeny of the *Echinidea*). Nat. Hist. Rev. October, 1864 (pp. 581-611, with woodcuts).

WRIGHT (*op. cit.* pp. 21-34) gives a general account of the terminology of the hard parts in the Sea-urchins and their classification with reference thereto, reproducing, almost *verbatim*, the Introduction to his published Monograph of the Oolitic *Echinidea*.

WYVILLE THOMSON reviews the existing state of our knowledge of the embryogeny of this order. His article, as might be supposed, is, in the main, a connected *résumé* of the memoirs of J. Müller and Krohn on this subject, references, where needful, being made to the writings of Busch, Derbès, and other observers. At present he would "refer all pseudembryos with ciliated epaulettes and simple frame-rods to the genus *Echinus*, and those without epaulettes, with fenestrated rods, and with an azygous inferior process to the *Spatangidæ*; but, perhaps, such a generalization may be premature." Of the embryogeny of the Cake-urchins nothing whatever is known, if we except Müller's conjecture that "a beautiful pseudembryo with a globular body, without ciliated epaulettes, with eight appendages, the styles of the four body-appendages fenestrated, and with an elegant reticulation of calcareous rods on the surface of the dome," might belong to *Echinocyamus*. In conclusion Thomson compares Pluteus with Bipinnaria, and offers some general comments on the exact relations of these and other "pseudembryos" to the young Echinoderms which they develop.

FISCHER seeks for a more exact expression of what we know of the boring-phenomena of *Echinus lividus*. His paper, after stating the problem, opens with a short description of the Biarritz coast, followed by an account of his observations on the perforations of *E. lividus* in the limestone rocks of that locality. Next he sums up the results of an examination of six series of rock-specimens containing similar perforations, preserved in the

Museum of Natural History. This is followed by a general summary of the author's views, ending with an historical survey of the whole subject, which, however, is by no means complete, allusion being made to the writings of only one British naturalist. Finally the author suggests the palæontological application of his studies, and refers to a block of oolitic limestone in which obscure perforations of an *Echinus* have been observed.

1. *Echinus lividus* is found in perforations of characteristic aspect at various stations on the Atlantic coasts of Ireland, France, and Spain, also on the shores of the Gulf of Lyons.

2. These holes occur in rocks which vary much as to hardness and mineralogical composition—limestone, sandstone, and granite.

3. The holes always contain water, even when situated between tide-marks.

4. The holes are regularly disposed in groups of from twenty-five to a hundred. They are so close together as to leave no room for the formation of other perforations between them. (Fischer, p. 322.)

5. The holes never communicate internally with one another, however they may approximate or appear indistinct at their margins.

6. Incrustations of calcareous *Algæ* usually cover the margins of the holes and the spaces between them. The nearer the holes the larger these laminae of Nullipores, which are always smooth, whereas when they occur apart from the holes their surface is much broken and presents a coralline aspect. (Fischer, p. 323.)

7. Minute fragments of shells, mixed with loose sand, may be found within the holes. When these are removed, the naked rock appears,—the interior of the perforations, save when abandoned by the *Echini*, being quite free from adventitious growths.

8. The holes vary in size. Each is exactly fitted to its inhabitant, sufficient space being left for the action of its spines.

9. In depth, each hole varies from about two to four centimetres, but in some specimens reaches ten centimetres. These deep holes are cylindrical. The ordinary holes are hemispherical. (Fischer, p. 322.)

10. Each hole contains but one *Echinus*. This invariably occupies the same position, its mouth resting on the centre of the base of the hole, which exhibits a corresponding impression.

11. In districts where the holes occur, the *Echini* are never found in any other situations. They never quit the water, or, so far as has been observed, their holes. How they feed is not known.

12. On sandy coasts *Echinus lividus* does not perforate; on some rocky coasts it simply takes up its abode in chance cavities. Perforation, therefore, seems to be determined, under certain conditions, by the vital necessities of the animal. Examples of Mollusks might be cited in which a like diversity of habit presents itself. (Fischer, p. 326.)

13. Seeing that these holes occur in rocks which differ widely in nature, their production may well be assigned to one and the same agency. The hypothesis of a chemical solvent is, for the same reason, not tenable.

14. That the *Echini* perforate the holes in which they occur, seems proved

when we consider (1) the similarity of aspect which these holes always present; (2) their size, corresponding to that of the inhabitant; (3) their internal surface, free from attached foreign bodies; and (4) the circumstance that no other boring agent likely to produce such perforations has yet been discovered.

15. How the holes are produced we cannot tell. The dental apparatus (Cailliaud), the ambulacral feet (Valenciennes), and the spines (Robert), have by different inquirers been presumed to be the agents of perforation. On this subject it would be premature to offer any opinion. (Fischer. p. 328.)

Grube cites seven Sea-urchins from Lossini. He discusses at some length the question whether *Echinus melo* and *E. flemingii* be not the same species, which he is disposed to answer in the affirmative. Intermediate varieties between these two forms certainly occur, and the difference of colour, given in systematic works, soon breaks down. A. Agassiz (p. 23), however, makes these species distinct.

Several new genera and species of *Echinidea* are defined by A. Agassiz, who gives, also, the synonyms of a number of others, previously described. A foot-note refers the reader to the "Illustrated Catalogue of the Museum," for descriptions of the new genera based upon species already known.

CIDARIDÆ.

Phyllacanthus imperialis (Brandt), found at Zanzibar and Mozambique, is distinct from *Ph. fustigerus* (A. Ag.), from New Holland and the East India Isles. The two have been confounded as *Cidaris imperialis*.

The restricted genus *Cidaris* should contain only *C. thouarsii* (Val.), *C. tribuloides* (Lamk.), *C. annulata* (Gray), *C. baculosa* (Lamk.), and their allies. *C. papillata* (Flem.) belongs to *Orthocidaris* (Ag.), as do likewise *C. hystrix* (Lamk.) and *C. affinis* (Phil.). The species figured as *C. baculosa* by Michelin (not Savigny) is probably identical with *Prionocidaris pistillaris* (A. Ag.). *C. tubaria* belongs to *Stephanocidaris* (A. Ag.).

Echinothrix (Pet.) is limited so as to contain only the species having broad ambulacra, and spines like those of *Diadema*. The remaining species, with short, longitudinally striated spines, have been removed by A. Agassiz to *Garelia* (Gray).

Colobocentrotus leskei (Br.) and *C. atrata* (Br.) belong to different genera; the latter to *Podophora* (Ag.), which includes also *Echinometra quoyi* (Bl., non *P. quoyi*, Ag.).

Heliocidaris chloroticus (Ag.) is referred to *Psammechinus*, *Toreumatica reevesii* (Gray) to *Temnopleurus* (Ag.), *Salmacis rarispinus* (Ag.) to *Melobosis* (Gir.).

New genera and species :—

Gymnocidaris minor, A. Ag.—Sandwich and Kingsmills Islands. *C. metularia* (Lamk.), from Zanzibar, is an allied species.

Temnocidaris, A. Ag. Known by its apical region deeply notched in the

angles of the interambulacral plates. Sp. *T. canaliculata*, A. Ag.—Caroline Islands.

Chondrocidaris, A. Ag. Scrobicular circle small, not more than half the length of the plate; oral plates covered with long, narrow spines; median ambulacral space with eight rows of small, equal tubercles; primary spines large, the angles of their grooves tending to run into sharp lamellæ, and spread, fan-shaped, at the end. Sp. *C. gigantea*, A. Ag.—Sandwich Islands.

Garelia cincta, A. Ag.—Kingsmills and Sandwich Islands. Perhaps = *Echinothrix turcarum* (Pet.). *Asteropyga subularis* (Ag.) belongs to this genus.

Echinothrix aperta, A. Ag.—Society Islands; *E. scutata*, A. Ag.—Sandwich Islands.

Diadema paucispinum, A. Ag.—Sandwich Islands; *D. mexicanum*, A. Ag.—Acapulco; *D. globulosum*, A. Ag.—Kingsmills and Society Islands.

Echinocidaris davisii (Ag.)—Nanshon, Massachusetts, South of Cape Cod; *E. incisa*, A. Ag.—Guayamas, Panama.

Echinostrephus, A. Ag. "Small sea-urchins with tubercles resembling those of *Holopneustes* in their arrangement, with narrow poriferous zones, pores arranged in arcs. Abactinal system raised above the level of abactinal part of test. Large genital plates occupying nearly the whole of this system. Actinal [oral] system large, circular, no indentations. Spines long, slender, longitudinally striated. Test convex near actinal portion, flattened above, the greatest diameter being nearer the abactinal pole. Auricles of medium size, with a large opening and no connecting ridge. Teeth provided with transverse arc." Sp. *E. aciculatus*, A. Ag.—Kingsmills and Sandwich Islands.

Acroladia cuspidata (A. Ag., = *A. trigonaria*, Mich. non Ag.)—Mauritius.

Echinometra vanbrunti, A. Ag.—Acapulco; *E. rupicola*, A. Ag.—Panama; *E. microtuberculata*, A. Ag.—Sandwich and Kingsmills Islands; *E. viridis*, A. Ag.—Florida; *E. plana*, A. Ag.—Hayti.

Parasalenia, A. Ag., has the raised abactinal system of *Salenia*, and the four anal plates of *Echinocidaris*; else like *Echinometra*; genital and ocular plates smooth; pores in pairs, forming an irregular vertical line. Sp. *P. grattiosa*, A. Ag.—Kingsmills and Society Islands.

Toxocidaris franciscana, A. Ag.—San Francisco. *Heliocidaris delalandi* (Ag.) and *H. mexicana* (Ag.) belong also to *Toxocidaris*.

Lytechinus atlanticus, A. Ag.—Bermudas; *L. variegatus*, A. Ag., is the *E. variegatus* of Lamk. (non Rav., which is identical with *L. carolinus*, Ag.).

Boletia granulata, A. Ag.—Sandwich Islands; *B. rosea*, A. Ag.—Acapulco.

Hipponoe violacea, A. Ag.—Sandwich and Kingsmills Islands; *H. nigricans*, A. Ag.—Society Islands; *Tripeustes sardicus* (Ag.) is referred to this genus, *Tripeustes* (Ag.) being limited to species in which the median ambulacral and interambulacral space is covered with tubercles.

CLYPEASTRIDÆ.

A. Agassiz refers to *Rumphia* (Des.) the *Laganum lesueuri* of Agassiz, a Hong-Kong species. Prof. Agassiz mentions it as coming from Guadaloupe; "this is probably a mistake."

Stolonoclypus rotundus, sp. n., A. Ag.—Acapulco.

Rhaphidoclypus microtuberculatus, sp. n., A. Ag.—Kingsmills Islands.
Clypeaster scutiformis (Lamk.) belongs to this genus.

CASSIDULIDÆ.

Pygorhynchus pacificus (Ag.), from Acapulco, is a living species of this genus, "thus far only known as fossil."

SPATANGIDÆ.

Kleimia nigra, sp. n., A. Ag., from Acapulco, probably belongs to a new genus, which its founder would term *Rhyssobrissus*.

Xanthobrissus, A. Ag., g. n., differs from *Meoma* (Gray) in "the position of the vertex, which is near the anterior extremity. Lateral ambulacra of equal size, anterior ambulacrum in a deep groove. Subanal fasciole heart-shaped, with lateral branches extending to the side of the anal system." Sp. X. *garretti* (A. Ag., = *Brissopsis*, Ag. MS.)—Kingsmills Islands.

HOLOTHURIDEA.

BAUR, A. Beiträge zur Naturgeschichte der *Synapta digitata*. Drei Abhandlungen. Dresden, 1864, 4to. (pp. 52, 60, 120, with eight plates). Reprinted from vol. xxxi. of K. L. C. d. Akademie.

NORMAN, A. M. On British *Holothuriadæ* with reference to new species. Rep. Brit. Assoc. Newcastle, 1863, Trans. of the Sections (p. 106).

STIMPSON, W. Descriptions of new species of Marine *Invertebrata* from Puget Sound, collected by the naturalists of the North-west Boundary Commission. Proc. Phil. Acad. No. 3, 1864 (p. 159).

Since Johann Müller, in 1852, published his singular researches on *Synapta digitata*, describing the production of testaceous Gasteropods within a peculiar tube attached to the intestinal vessel of that Echinoderm, no other naturalist had sought, by the method of direct observation, to solve the curious problem thus raised. During the autumn of 1860, and spring and summer of 1861, DR. BAUR visited for this purpose the Bay of Muggia, near Trieste, the scene of Müller's investigations in 1851. In April 1862 Dr. Baur communicated to the Berlin Academy a condensed account of his observations on the development of *S. digitata*, and the mode of attachment of its molluscigerous sac. On his return from Trieste the author busied himself with the anatomical study of numerous specimens of *S. digitata*, which he had brought with him, preserved in spirit. The results of these inquiries were, in November 1863, forwarded to the Imperial German Academy for publication. They now appear *in extenso*, together with the detailed history of Dr. Baur's previous investigations, under the form of the copiously illustrated monograph which we have cited above.

The monograph is divided into three parts. The first (pp. 52), entitled "On the Anatomy of *Synapta digitata*," after a general introduction, reviews the organization of the adult animal under the heads (1) internal skeleton, (2) perisome, (3) alimentary canal and vascular system, (4) water-vascular system, (5) nervous system and organs of sense, and (6) reproductive organs. The subject-matter of each of these is still further divided, in a way very convenient for reference.

The second part of the monograph (pp. 60) treats of "The Metamorphosis and Development of *S. digitata*." The author describes the method which he was led to adopt for procuring the young of this species—a minute, worm-shaped organism dwelling in fine mud at the bottom of the sea, and, by reason of this peculiarity of habit, escaping the notice of previous observers. These young are developed from one of the two kinds of Auriculariæ described by Müller. Baur shows that the Auriculariæ with calcareous wheels belong to *S. digitata*, and has examined vermiform young in which similar calcareous corpuscles were still clearly perceptible. He has observed all the essential intermediate stages, including the "pupæ" which the auricularian "larvæ" produce. Our author has also obtained the young of *Synapta inherens*, now almost universally admitted to be distinct from *S. digitata*. To this section is appended an essay on the so-called alternation of generations among the *Echinodermata*, the nature of which Baur rightly apprehends, regarding it as a mode of internal development accompanied with metamorphosis.

The third and concluding division (pp. 120) of the work, by far the most voluminous, is devoted solely to a statement and partial explanation of the circumstances which attend the presence of the "snail-producing tube" in some specimens of *S. digitata*. Baur in the first place points out the questions to be solved, and the attempts hitherto made with that object. He then proceeds to demonstrate that the molluscigerous sac is an animal organism complete in itself, living for itself, and provided with sexual apparatus—in short, a sac-shaped, naked Mollusk, which he would name *Helicosyrinx parasitica*. The production of several successive broods, which undergo their complete development within the sac, excludes the hypothesis of its being a mere proglottis or generative segment (p. 58). The place for this Mollusk would seem to be among the *Apneusta*, or near the *Nudibranchiata*. Though destitute of feet, shell, and gills, the structure of its generative organs and young clearly show that it belongs to the class of *Gasteropoda*. *Helicosyrinx* possesses the following parts:—body-wall, digestive canal, ovaria and testes, accessory reproductive glands, and generative chamber. There are two orifices, an oral and a genital. No anus exists. All these parts are described in detail. They are organically

connected with one another, whereas, on the other hand, the attachment of the parasite to its host, however intimate, is merely mechanical. The precise mode of attachment is described with suitable minuteness. One end of the tube is buttoned on to the intestinal vessel, opposite the mesentery; the other end is free, or, in a few cases, firmly interlocked with the head of the *Synapta*. Free molluscigerous sacs, neither end being adherent, are also rare. Such exceptional instances do not, as Müller and others have supposed, tend to explain the mode of entry of the parasite or its previous history. On both these points exact knowledge has yet to be sought. After stating the several issues involved, Baur concludes by indicating the direction in which we are to look for the determination of the most probable. His negative results have, at least, this merit—that they clear the way for an inquiry in which the difficulties of observation are unusually formidable; and his careful treatment of the whole subject displays a skill in analysis which renders the perusal of his work especially instructive and satisfactory.

Remarks on known species :—

Grube (pp. 98–100) found about Lossini seven species of *Holothuridea*. All of these, excepting *Cucumaria tergestina* (Sars) had previously been noted in his work, 'Actinien, Echinodermen und Würmer des Adriatischen und Mittelmeers,' 4to. Königsberg, 1840.

Grube gives revised definitions of the following species: *Holothuria catanensis* (Gr.); *H. stellata* (d. Chi.); *H. glabra* (Gr.). On each of these he offers some comments. *H. catanensis* and *H. glabra* are for the first time figured. Grube has also met with some small Sea-cucumbers, which he supposes may be the young of *H. tubulosa*.

The following species, quoted by NORMAN, are additions to the British fauna since the publication of Forbes's monograph of the British Echinoderms :—

Cucumaria elongata (Düben & Koren); *Thyone raphanus* (D. & K.); *Psolus squamata* (D. & K.); *Holothuria nigra* (Peach); *Synapta inherens* (Müller).

New species :—

Psolinus pusillus (Norman), Durham coast; *Thyone floccosa* (N.), Cornish coast; *Synapta tenera* (N.), Clyde.

Norman is of opinion that the minute dermal plates of the *Holothuridea* will afford valuable specific characters.

Stimpson defines :—

Pentacta piperata, sp. n. (Stimpson); *P. populifer* (St.)

ADDENDUM.

LEYDIG, F. Vom Bau des thierischen Körpers. Handbuch der vergleichenden Anatomie. Erster Band, erste Hälfte. Tübingen, 1864, 8vo (pp. 278)

1864. [VOL. I.]

LEYDIG, F. Tafeln zur vergleichenden Anatomie. Erstes Heft. Zum Nervensystem und den Sinnesorganen der Würmer und Gliederfüssler. Tübingen, 1864, folio (ten plates, with explanatory text).

Here at the conclusion of our survey of the literature of the neurosomatous animals, we may call attention to the appearance of a new work, by Leydig, on Comparative Anatomy with special reference to histological details. His 'Handbuch' can hardly fail to be acceptable to the student, since a good treatise of this kind has lately been much needed. The entire work will consist of three volumes, each including from about 30–36 sheets of letter-press. The moiety of the first volume now before us may be resolved into two very distinct divisions. The first of these (pp. 1–114), is introductory, and is mainly devoted to a survey of the animal tissues. It concludes with some general considerations on the organs and organic systems, in relation both to the animal body, viewed in the abstract, and to the different groups into which animals are divided. The second division takes up the organic systems, commencing with those of animal life, and, before all others, the nervous system.

Of this section three chapters here appear. The first (pp. 117–126) treats of animals whose nervous system is absent or doubtful (*Protozoa—Cæliterata—Nematoidea*); the second (pp. 126–9), of animals with radiating nervous system (*Cæliterata?—Echinodermata*); the third, of animals with laterally symmetrical nervous system. This chapter, entirely devoted to the nervous system of the Worms and *Arthropoda*, brings the work, so far as published, to a conclusion (pp. 130–278).

The utility of the manual for reference is further increased by the historical summaries introduced throughout its second division, which supply in some degree the place of a bibliography.

The Atlas, of which ten plates have been already issued, will be found a useful companion to the 'Handbuch.' It contains figures from the author's original drawings, to which frequent reference is made in his notes.

Thus the reader will perceive that these works are distinct in their scope, both from Leydig's former treatise on Histology and the 'Icones Histilogicæ' of Kölliker.

London, Sept. 25th, 1865.

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