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a Journal of Malacology.*

EDITED BY
WALTER E. COLLINGE.

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THE JOURNAL OF MALACOLOGY

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VOL. III.

NOTES ON VERONICELLA BIRMANICA, Theobald.

By WALTER E. COLLINGE,

Mason College, Birmingham.

IN the most recent catalogue of the slugs Professor Cockerell includes under Gray's family *Veronicellidae* the following genera:—*Veronicella*, *Leonardia*, *Othelosoma* (?), *Rathousia*, *Atopos* and *Prisma*, making a total of 140 distinct species. A very large proportion of these have been created by Dr. Simroth and Professor Semper upon good anatomical grounds, but many others have been named upon purely external characters, and sooner or later will have to be removed from the list. The genus and its affinities are but imperfectly understood, and it is to be hoped that those malacologists who have opportunities for studying living material will endeavour to add to our knowledge of the anatomy.

Recently I have obtained examples, in alcohol, of *V. birmanica*, Theob., and although not in a good condition for anatomical purposes, they show all the external features as well as could be desired. In comparing them with the published accounts I find the description of the foot-sole is very inadequate, and so venture to re-describe the same.

Under the generic title of *Vaginulus* this species was described by Theobald in 1864,¹ later by Nevill,² and in 1873 by Stoliczka.³

1. Journ. Asiatic Soc. Bengal, 1864, vol. xxxiii., p. 243.

2. Mollusca Indian Mus., p. 199.

3. J. A. S. B., 1873, vol. xlii., p. 34.

My specimens average from 28 to 38 millim. in length, and 10 to 18 millim. in breadth. The ground colour is yellowish-brown, minutely marked with a series of black dashes and spots, these being absent in the median line of the dorsum, in which runs a pale yellow line. Stoliczka mentions that "the median dorsal pale stripe generally becomes distinct only in older specimens, and the lower side of the mantle is uniform livid; in very young specimens the pale stripe is absent, and the mantle marked below with dark dots." It is evident that these characters are hardly likely to be characteristic. I have young examples in which the pale stripe is present, and old ones in which the mantle is marked below with numerous dark dots.

Theobald (*op. cit.*) describes the foot as "*Pede transversim rugoso, totius corpore longitudo, sed vix ad quartam partem latitudines attingente.*" Nevill states that the sole of the foot is "nearly white with faint transverse white lines." Now in the specimens I have the foot is very similar to the ground colour of the dorsal surface—it is certainly not white or even pale yellow. The foot sole may be divided into seven distinct parts. On either side is a plain lateral plane, finely and irregularly marked, next a distinct line separating the lateral plane from, what I shall term, the inner plane, which is divided in a regular manner by a series of transverse lines or grooves at intervals of about $\frac{1}{2}$ millim. The two inner planes stand out more prominently than any other portion of the foot, so that the median plane is somewhat concave, but possibly this is only due to the effect of the alcohol. The median plane is also marked by a series of fine transverse lines.

In the largest specimen, measuring 38 millim. in length and 18 millim. in breadth, the lateral planes are 1 millim. broad, the inner planes $\frac{1}{2}$ millim., and the median plane 1 millim.

The median plane is really the outer wall of the pedal gland, and passes from just beneath the mouth to the posterior end of the body, gradually becoming narrower and terminating about two millim. from the extreme edge of the foot-sole.

As to the name of this species, Stoliczka (*loc. cit.*, p. 33) suggested it was the *V. hasselti*, Von Mts., 1867, and that both were very probably the *Oncidium molli* of Hasselt (= *V. mollis*, Hasselt). I am not acquainted with the anatomy of either of these two forms, but seeing that *V. birmanica* has received more attention than any of the three, and is better described, it had better remain irrespective of what is done with the remaining two, which, as yet, are inadequately described.

The generic name, I may mention, should rightly be accredited to Keferstein, as Blainville's original and corrected descriptions are both wrong and inadequate, and it is quite clear that he did not understand the genus. Keferstein's⁴ description is much the better, and I think, with Stoliczka, that it should be accepted.

DR. PAUL FISCHER.

By EDGAR A. SMITH, F.Z.S.,

Zoological Department, British Museum, London.

It is with the deepest regret that we have to record the death of this distinguished palæontologist and malacologist. It is a great loss to our favourite science, and France has truly to mourn one of her most illustrious writers on Malacology. Many of Fischer's fellow-countrymen have been great malacologists or conchologists. Adanson, Cuvier, Lamarck, Draparnaud, Lacaze-Duthiers, Moquin-Tandon and Deshayes, are some of the greatest pioneers in conchology; but we may safely say, without fear of contradiction, that Fischer has done as much to advance the study of this subject generally, as most of these.

Paul Fischer was born in Paris on the 7th of July, 1835. For many years he held the office of Aide-naturaliste of the chair of Palæontology at the Jardin des Plantes, and was also a member of the Commission of Sub-marine Dredging. He died on the twenty-ninth of November last year, at the comparatively early age of 58 years.

Among his principal works, we may mention—"The Palæontology of Asia Minor," written in conjunction with MM. d'Archiac and De Verneuil; "The Land and Freshwater Mollusca of Mexico and Central America, 1869-92," in collaboration with M. Crosse; "The Fossil Animals of Mount Léberon," in conjunction with MM. Gaudry and Tournouer 1873; "The Palæontology of the Isle of Rhodes, 1877;" "The Cetacea of the South-West of France;" Reports upon the Brachiopoda obtained during the Scientific Expeditions of the "Travailleur" and "Talisman" and the Prince of Monaco's yacht "Hirondelle," in conjunction with D. P. Ehlert.

4. Zeit. f. wiss. Zool., 1864, vol. xv., pp. 113-26.

In addition to these more extensive works, Fischer has written no less than three hundred and nine separate papers treating upon all branches of the science of malacology, and as many as one hundred in conjunction with Crosse, Bernardi, Bouvier, Dellese, Delfortrie, H. Fischer, de Folin, Gassies, Hupé and Tournier. Very many of these memoirs are of the highest importance, and have thrown much light upon the general classification of the Mollusca. Fischer was a clever anatomist, and many of his most valuable treatises are those devoted to the anatomy of hitherto unknown molluscs.

Notwithstanding the very large number of his papers and their importance, there is little doubt but that at present he is most widely known as the author of the "Manuel de Conchyliologie et de Paléontologie Conchyliologique," published in 1880-7. It is indispensable to every worker in the science of which it treats, and, although not perfect in every respect, as a work of general reference it was, at the time of its publication, and even now stands, *facile princeps*.

With regard to Fischer's personal qualities we can say nothing from our own experience, but we can state on the evidence of others who have had the advantage of his personal friendship, that he was of a genial and sympathetic nature. He was ever ready to help, and, judging from his writings, was not prone to be severe in his criticisms on the work of others. He was a member of several learned societies at home and abroad, was elected President of the Zoological and Geological Societies of France, and last year honoured us by becoming a member of the Malacological Society of London.

NOTE ON TWO VARIETIES OF ARION RUFUS, L.

By E. R. SYKES, B.A., F.Z.S.,

London.

MR. COCKERELL has in his "Check-List of the Slugs" recorded a variety *lamarckii*, Kal.,¹ of *Arion rufus*, L. (No. 367b), and in a note on this (p. 207) he says, "Gray (*Cat. Pulm. B.M.*, 1885, p. 54) quotes *Limax ruber*, Drap. I cannot now consult

¹ *Conchologist*, 1893, vol. ii., p. 190.

Draparnaud's work, but if the present variety was named *ruber*, of course *lamarckii* must fall." 1885 is of course an error for 1855. On referring to Gray's work I find that he refers to Draparnaud's *Tab. Moll. de France*, p. 102, and also to Lamarck's *Ency. Method.* pl. 463, f. 2; but on turning to these I find no reference to any *ruber* at all. How Gray made the error I know not, unless he carelessly copied without verification from Ferussac et Deshayes (*Hist. Nat. Moll.*, ii., p. 60, pl. 1, f. 1), where these references appear, as also does a reference to Draparnaud (*Hist. Moll. France*). This part of the text was written by Ferussac himself and published between 1819-1832, the remainder of the volume taking twenty years more for its completion.

There is then no variety *ruber* of Draparnaud and there is no variety *ruber* of Ferussac, as he only named it "var. *n.*" and characterised it as "*totus ruber*." Draparnaud referred to a reddish form, but to which I cannot determine. Thus *lamarckii*, Kaleniczenko, can stand. It was described by him in 1851 in a paper called "Description des limaces qui se trouvent dans l'Ukraine," which appeared in the *Bull. Soc. Imp. Nat. Moscou*, xxiv., No. iii., and was characterised as "*totus ruber*."

ON THE VALIDITY OF ARION OCCIDENTALIS, Ckll., A SUPPOSED NEW SPECIES.

BY WALTER E. COLLINGS,

Mason College, Birmingham.

MR. T. D. A. COCKERELL has recently described¹ from a single example what he supposes to be "an apparently new species" of *Arion*. The specimen, which is now in the British Museum, is from Jurancon, near Pau, Basses Pyrenees. Its state of preservation is such as not to favour a minute examination, but Mr. Cockerell has described it in some detail and figured the more important points. After having made a careful examination of the same I am of opinion that it is nothing more than an example of the well-known *A. hortensis*, Fér.

¹ Journ. Conch., 1893, pp. 192-3.

I regret that before adding another synonym to the list of this last-mentioned species, Mr. Cockerell did not obtain and examine further specimens, for the practice of describing species from single examples—unless the points of difference are exceedingly well marked—is, in my opinion, one that is strongly to be deprecated for reasons that are obvious.

In *A. occidentalis* I fail to see the peculiarities its author mentions in the reproductive organs. The form of the sperm-duct (*Patron enstrecke*) agrees with that organ in a typical *A. hortensis*, as does also the receptaculum seminis and its duct. The retractor muscle is attached to the proximal end of this duct and arises posterior to the pericardial chamber, and not as described by Mr. Cockerell. There are two vestibules and a "distinctly swollen" oviduct.

Compared with *A. celticus*, Poll.,—which is but a variety of *A. hortensis*,—or the var. *cæruleus*, Cllge., the anatomical differences are insignificant, and even were these minor variations constant, which still remains to be proved, they are insufficient to separate it from *A. hortensis*. Of course no two specimens are exactly alike, and unless a reasonable range of variation is allowed, we shall have the *hortensis* group of *Arion* in the same condition as the genus *Amalia*.

If *A. occidentalis* has to take rank as a valid species, further anatomical differences must be shown to exist, as otherwise it cannot be regarded as anything but *A. hortensis*, Fér. The external features may possibly be sufficient to characterise it as a variety?

ADDITIONS AND AMENDMENTS TO THE SLUG LIST.

"I SEND herewith a few observations on the Check-List of Slugs. I would again repeat with all emphasis that *Limax* is not a native of Australasia. I have already said so in my article of February, 1892 (*Ann. Mag. N.H.*). Both in species and individuals *Limax* is most plentiful in and around the cities, and they grow more numerous in some places than I ever saw them in Europe. Just in proportion as the civilisation of the whites is left behind so do these slugs become scarcer, and, once the untouched bush is reached, all have disappeared.

In New Zealand, Tasmania, Australia and New Guinea I have searched the virgin forests where unspoiled by the axe and fire of

civilisation, and have never, never, seen a *Limax* there. Only when civilisation has invaded such solitudes, only in company with introduced herbs, grasses, shrubs, &c., do the introduced *Limax* appear. I pointed this out to Suter, who at once grasped the significance of the fact and recorded it (*Journ. de Conchyl.*, 1892, xxiii., p. 252). If you rank the sparrow, thistle and *Limax* as native to Australasia, the whole fabric of geographical distribution is destroyed.

I object to several sins of omission and commission in the list. Mr. Cockerell has apparently accepted my correction (*Ann. Mag. N.H.*, February, 1892) *re megalodontes*, and withdrawn his reference of it to *Aneitea*. He has also followed me (P.L.S., N.S.W. (2), v. p. 896) in reducing *legrandi* to *agrestis*. Under *lævis* he should have added my *queenslandica*, figured and described in the *Proc. Roy. Soc., Q'land.*, vol. v., p. 150, pl. 5; which species is, at Dr. Simroth's advice, withdrawn (P.L.S., N.S.W. (2), v. p. 897).

Since Mr. Cockerell accepted my reference of *legrandi* to *agrestis*, he might as well have taken my word for it that *tasmanicus* is *gagates*; *maura* is also *gagates*.—CHARLES HEDLEY, F.L.S., Australian Museum, Sydney, Nov. 13th, 1893.

[The above notes are extracted from a letter of Mr. Hedley's with his sanction.—W.E.C.]

THE MALACOLOGICAL SOCIETY OF LONDON.

Nov. 10th, 1893.—Mr. Edgar A. Smith, F.Z.S., in the chair.

The following were elected members of the Society:—Prof. S. Brusina, Prof. Dr. O. Boettger, D. D. Baldwin, J. E. Cooper, W. H. Dall, J. C. Hippolyte Crosse, and the Rev. Prof. H. M. Gwatkin.

The following communications were read:—"Descriptions of twelve new species of Shells, chiefly from the Mauritius," "Description of a specimen of *Xenophora pallidula* from the Indian Ocean," "Description of three new species of shells from the Indian Ocean," by G. B. Sowerby, F.Z.S.

"Note on the possible acclimatization of *Crepidula fornicata* in the British Seas," by B. Sturges Dodd. "On the alteration of the Generic name *Clausilia*," by G. F. Harris, F.G.S.

"Notes on the British Chitons," by E. R. Sykes, B.A., F.Z.S.

Dec. 8th, 1893.—Dr. Henry Woodward, F.R.S., &c., in the chair.

The following were elected members of the Society :—
J. Crawford, John Brazier, R. Cairns, E. C. Stump, Miss Foster,
Rev. G. W. Taylor, Dr. Cox, G. B. Pritchard, F. B. Billing-
hurst, W. T. Bednall, C. E. Beddome, Miss Lodder,
Mrs. Waterhouse, Capt. F. W. Hutton, R. Murdoch, J. W.
Taylor, Arnold V. Henn, J. R. Ragsdale, Dr. E. von Martens,
J. G. Chaplin, H. Burnup, J. F. Quekett, John Farquhar,
C. A. Wright, H. K. Jordan, Dr. W. Kobelt, J. D. Butterell,
J. H. Vanstone, the Marquis de Monterosato, M. Berthelin,
A. Bonnet, and B. Sturges Dodd.

The following communications were read :—“On a New
Species of *Engina* from Loyalty Islands,” by J. Cosmo Melvill,
M.A., F.L.S. “Note on *Bulimus oblongus* and *Streptaxis*
deformis,” by W. Moss. “Description of new shells from
Mauritius, &c.,” by G. B. Sowerby, F.Z.S., F.L.S. “The
Myology of some Pulmonate Molluscs, considered as a feature
in generic, &c., distinction,” by Walter E. Collinge. “Two
new land shells from Tenerife,” by J. H. Ponsonby, F.Z.S.,
and E. R. Sykes, B.A., F.Z.S. “Remarks on the suggested
alteration of the generic name *Clausilia*,” by E. R. Sykes, B.A.,
and G. F. Harris, F.G.S.

Jan. 12th, 1894.—Dr. Henry Woodward, F.R.S., &c., in the chair.

The following were elected members of the Society :—
Dr. A. Brot, Mons. Caziot, Mrs. Henry Woodward, Miss
Skeet, Rev. H. Milnes, A. E. Craven, Langley Kitching,
E. H. Mathews, B. Schmacker, and Henry Sutcr.

The following communications were read :—“Three new
species of *Ampullaria* and supplementary description of
Voluta bednalli,” by G. B. Sowerby, F.Z.S., F.L.S. “On some
new species of Marine Shells from New Zealand and Australia,”
by Edgar A. Smith, F.Z.S. “On a new *Helix* from the Khasi
Hills,” by John Ponsonby, F.Z.S. “Discovery of a Pteropod
in British Eocene Strata; with description of a new species,” by
G. F. Harris, F.G.S. “Revision of British Eocene *Scaphopoda*;
and description of some new species of British Eocene and
Oligocene Mollusca,” by R. Bullen Newton, F.G.S., and
G. F. Harris, F.G.S.

NOTES.

Pfeiffer's dates of publication, &c.

Other students of the N. Z. Mollusca and myself are interested to learn by means of the note in the September number of "The Conchologist" (p. 180), by E. R. S., the real date of Pfeiffer's alpha-beta series of names. What I had conjectured is thereby proved that these names first appeared not in the P. Z. S., but in the *Mon. Hel. Viv.*, vol. iii. When engaged in preparing the "Reference List" I sought, like E. R. S., particulars of these publication dates from the Zoological Society, who courteously acknowledged my inquiry, and withheld the information.

Another series of dates has lately puzzled me, viz., those of publication of the *Journal de Conchyliologie*. I should like to learn, and so no doubt would other malacologists, when the last four numbers, dated respectively on the first page 1st Jan., 1893; 1st Oct., 1892; 1st July, 1892; and 1st April, 1892, were received at, say, the Library of the British Museum.—CHARLES HEDLEY, F.L.S., Australian Museum, Sydney.

The *Journal de Conchyliologie*.

The question Mr. Hedley raises *re* the actual date of publication of certain parts of this valuable quarterly, is one of great importance, and I venture to suggest that future copies should bear the exact date, *e.g.*, January 1894 (published February 1st, 1894). I have communicated with Mr. E. R. Sykes, and he has very kindly sent to me the actual dates of receipt that the above-mentioned copies in the British Museum (Natural History) bear on their covers.

DATE ON COVER.					STAMPED.
1st April, 1892	...	...	...	...	3rd Sept., 1892
1st July, 1892	...	...	...	...	22nd Feb., 1893
1st Oct., 1892	...	...	...	...	10th May, 1893
1st Jan., 1893	...	...	...	...	22nd July, 1893
1st April, 1893	...	...	...	...	19th Dec., 1893

It seems to me that unless a sheet is printed giving the actual dates of publication of those parts issued during the last three years *considerable doubt* will be thrown upon the claim for priority of many authors.—WALTER E. COLLINGE.

CURRENT LITERATURE.

In order to make the following Bibliography as complete as possible, the Editor invites the co-operation of British and foreign authors. All communications should be addressed to the Editor, the "Journal of Malacology," Mason College, Birmingham, England.

MALACOLOGY IN GENERAL.

Kew, H. Wallis.—The Dispersal of Shells. London, 1893. (Inter. Sci. Ser., vol. lxxv., pp. i.-xiv. and 1-291.)

Very carefully, and with much attention to detail, Mr. Kew has collected together a large body of facts relating to the means of dispersal possessed by the land and freshwater Mollusca; but surely his enthusiasm has led him rather far when he records such a hazy reference as (p. 142): "Dr. Scharff tells me that he remembers having somewhere seen an account of," &c. A certain feeling of disappointment arises when we find that almost all the well authenticated cases will only account for the scattering of mollusca over a very small area. No case is on record, for instance, of any bird having been seen in Britain with any

foreign species of mollusca attached to it. Again, there is no case of timber bringing live mollusca, the author can only say "it may be done," not "it has been done." Put shortly the facts will only account for the stocking of isolated ponds and other such localities, not for the introduction of species from another country by animals. It is surely "flogging a dead horse," too, to expend time and space in proving that *Helix cantiana* is indigenous to Britain, and that *H. limbata* and *H. aperta*, &c., are not. The mass of references—which should have appeared as a bibliography—will be found very useful, though by no means complete. They are somewhat alarming in their present form to the ordinary reader. Chapter v. and vii. are very fragmentary.

It must not be supposed because we have dwelt upon the above points, that we do not appreciate the time and attention that has been given to so interesting a subject; on the other hand, we feel sure that the work will be read with much interest by many, and form a handy reference volume on the subject of distribution.

—E. R. S.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. i., pt. 57; ser. ii., pt. 33. Philadelphia. Academy of Natural Science.

In the Marine series, part 57 commences vol. xv., with which the first series will close, and contains *Acanthochiles*, *Katharina*, *Amicula*, *Cryptochiton*, *Cryptoplax*, and *Choneplax*. The following are described as new:—*Acanthochiles pygmaeus* (near *A. spiculatus*), *A. exquisitus*, *A. rhodens*, *A. bisulcatus*, *A. hemphilli*, *A. carpenteri* (described from a series of drawings left by Carpenter!), *A. involutus*, Cptr.

An appendix to vol. xiv. is commenced, in which *Trachydermon* is raised from a sub-genus to a genus and divided into three sections, chiefly distinguishable by the length the gills extend.

In the Land series, vol. ix. commences with a guide to the groups of the Helices and a synopsis, partly contained in part 33. It opens with *Trachomorpha*, and the species of this group are catalogued geographically. It may be noted that the distribution is as follows:—India, China, &c., 15; Andaman and Nicobar Islands, 6; Philippines, 26; Java, Celebes, Moluccas, 13; New Guinea, &c., 7; Solomon and New Hebrides, 27; Polynesia, Pelew to Marquesas groups, 41; unknown habitats, 8. We then pass through *Punctum* to *Laoma*, which is divided into *Laoma*, s. s. and *Phrixgnathus*. *Flammulina* comes next, and is divided into many sub-genera, one of these, *Hedleyconcha* (a horrible name), is new. Its type is *H. delta*, Pfr. *Endodonta* next occupies our attention, it is divided into eight sub-genera, chiefly founded on the presence or absence of teeth in the aperture, and the shape or sculpture of the shell. *Diglyptus* is a new name for *Diaglyptus*, Pilsbry, which has been found to be preoccupied in Insecta. *Tesseraria*, Btg. (preoccupied in Medusæ), and *Tropidoptera*, Ancey (preoccupied in Coleoptera), are replaced by *Phenacharopa* and *Pterodiscus*. *Thauminatodon* is a new section for part of *Pitya*, Pease (not of Beck). *Nesophila* is proposed for species of the last, having no teeth on the outer wall. We now pass to *Phasis*, containing only South African species, and then to *Amphidoxa*. Next comes the great Patuloid group. For the group usually known as *Patula*; *Pyramidula*, Fitzinger, is proposed. The reason of this is, Mr. Pilsbry states, that "In treating of the sub-genus *Patula* it will be shown that the name is not available for the present genus as a whole." Anxiously we turn on and we find that the part, like the first volume of an ordinary novel, has stopped at the most interesting point—viz., half-way through the generic description of *Patula*.—E. R. S.

STRUCTURE AND DEVELOPMENT.

Boutan, L.—Mémoire sur le système nerveux de la *Nerita polita* et de la *Navicella porcellana*. Arch. de Zool., exp. et. gen., 1893, pp. 221-266, pls. xv-xvi.

Collinge, Walter E.—The anatomical characters of *Arion flagellus*, Cilge. Irish Nat., 1893, vol. ii., pp. 316-17.

Davenport, C. B.—Studies in Morphogenesis. I. On the develop. of the Cerata in *Eolis*. Bull. Mus. Comp. Zool. Camb., U.S.A., 1893, pp. 141-8, 2 pls.

D'Hardivillier, A.—Sur quelques faits que permettent de rapprocher le système nerveux central des Lamellibranches de celui des Gastéropodes. Comptes Rendus, 1893, vol. cxvii., pp. 250-2.

Fischer, H.—Note sur quelques points de l'histoire naturelle du genre *Eutrochatella*, P. Fischer (*Trachatella*, Swainson, 1840, non Lesson, 1830). Journ. de Conchyl., 1893, pp. 85-89, pl. iii.

Godwin-Austen, H. H.—On the Molluscan genus *Paryphanta*, and on the anatomy of *P. hochstetteri*, Pfr. Proc. Malac. Soc. Lond., 1893, vol. i., pp. 5-9, pl. i.

P. hochstetteri, Pfr., is very closely allied to *P. busbyi*, Gray, in this paper the anatomy is carefully described, and illustrated by thirteen figures. Its affinities with *Testacella* and *Schisoglossa* are dwelt upon, and for the three genera *Paryphanta*, *Elaea*, and *Schisoglossa*, the author proposes a new sub-family *Paryphantinae*. Further researches into the affinities of these genera and of the *Testacellidae*, will no doubt result in grouping them all under one family.

Fig. 16 is of *T. maugei*, we think, although the form of the receptaculum seminis and duct looks more like that of *T. scutulum*. The author in a foot-note (p. 7) states: "I took it to be *T. haliotideae*." It "shows a close convolution of the vas deferens for a short distance, and just where it first becomes a free tube." On the plate and in the explanation it is given as *T. maugei*?—W. F. C.

Hedley, C.—On *Parmacochlea fischeri*, Smith. Macleay Mem. Volume, 1893, pp. 201-4, pl. xxvii.

This interesting species was described by Mr. Edgar A. Smith in 1884 (P. Z. S., p. 273, pl. xxiii.). Mr. Hedley's specimen was one-third larger than the original "Challenger" specimen, measuring—in spirit—27 millim. He shows that Tryon is wrong in associating *Vitrina australis*, Reeve, with this species, the former not at present being known to inhabit Australia. The mantle lobes, though more grown together than in *Helicarion*, have not become fused as in *Cystopelta*. A somewhat lengthy account is given of the radula. The shell and internal structure are briefly described and figured. The convolutions of the vas deferens are very numerous, and form an intricate mass spread along the base of the duct of the receptacular seminis. "The chief peculiarities of the mollusc under discussion are: the uncoiling of the whorls and the insertion of the intersutural supplementary plate of the shell, the partial atrophy of the mantle lobes, the numerous convolutions of the vas deferens, and the sac developed in the penis near the origin of its retractor muscle. The resemblance, both external and internal, of *Parmacochlea* to *Helicarion* calls for its classification beside that genus in the sub-family *Helicarioninae*, whilst the differences between them clearly entitle it to generic rank. The abnormal shell induces me to support a descent and divergence from some form very similar to *Helicarion robustus*, Gould."

Köhler, August.—Beitrage zur Anatomie der Gattung *Siphonaria*. Zool. Jahrb., 1893, Bd. 7, pp. 1-92, pls. i-vi.

Metcalf, M.—Contributions to the Embryology of *Chiton*. Stud. Biol. Lab. John Hopkins Univ., 1893, vol. v., No. 4, 2 pls.

Oswald, Ad.—Der Rüsselapparat der Prosobranchier. Jen. Zeit. f. Nat., 1893, Bd. xxviii., pp. 119-62, T. v.-vi. and woodcuts.

Plate, Ludwig H.—Studien über die Opisthopneumonische Lungensehnecken. Zool. Jahrb., 1893, Bd. 7, pp. 93-234, T. vii.-xii.

Stauffacher, Heinrich.—Eibildung und Furchung bei *Cyclas cornea*, L. Jen. Zeit. f. Nat., 1893, Bd. xxviii., pp. 196-246, T. xi.-xv. and woodcuts.

Vayssiére, A.—Etude zoologiques du *Weinkauffia diaphana*. Journ. de Conchyl., 1893, pp. 90-97, pl. iv.

- Vayssière, A.—Observations zoologique sur le *Crepidula moulinii*, Michaud. Ibid., pp. 97-103, pt. of pl. v.
- Woodward, M. F.—On the Anatomy of *Ephippodonta maddougalli*, Tate, Proc. Malac. Soc. Lond., 1893, vol. i., pp. 20-26, pl. ii.

VARIATION.

- Hornell, James.—Albinism amongst Marine Animals. Journ. Mar. Zool., 1893, vol. i., p. 6.
- Webster, G. W.—Variations of *Strobilops hubbardi*. Naut., 1893, vol. vii., p. 84.

CLASSIFICATION, NOMENCLATURE, NEW GENERA AND SPECIES.

- Babor, J. and Košťál, J.—Note sur une espèce nouvelle d' *Arion*.

Věst. Král. České Spol. Náuk., 1893, pp. 1-4, pl. iv.

Messrs. Babor and Košťál describe and figure a new and interesting species of *Arion* (*nejdovskiji*). The description is as follows:—"A. parvulum, in extensione gracillimum, dorso rugis subtilibus densis ornato; color dorsi flavo-rubellus, cupri fere habitum imitans, laterum albidus capitis tentaculorumque ater ardestiacus, summa dorsi et clypei portione cinerea; zonis lateralibus atris, tenuibus distinctissimis, figura lyriformi in clypeo simili; pedis margine albo, haud lineolato; soleae parte media pallida, lateralibus aurantiacis; sudore luteo; limacella nulla."

Hab.: Jarov prope Závist' in Bohemia centrali.

The authors have taken considerable pains in describing the anatomy. The nervous system is typical of the genus. The pedal gland occupies two-thirds of the length of the body, and the caudal gland is considerably developed. The generative system is described in detail. The hermaphrodite gland is large and composed of two parts, each being formed by a number of large bluish-grey lobes; the hermaphrodite duct is tolerably long and dilated towards its end, and in three twisted segments, the last forming the seminal vesicle, not far from the albumen gland. This gland is white and composed of little closely set tubes, slightly pigmented at the entry of the hermaphrodite duct. The ovi-sperm duct (prostate and oviduct) is folded upon itself, forming two and a half folds, it is white, with purplish sacculations. The sperm duct is rather short, with a cylindrical beginning and ends in a considerable swelling, the retractor muscle attached to the swelling is inserted in the posterior border of the pulmonary wall. In the swelling there is a conical gland surrounded by a large fold in the form of a prepuce. The vas deferens is small. There is a single vestibule from which the receptacular duct opens as a broad pouch terminating in a small receptaculum seminis.

A. nejdovskiji somewhat resembles *A. intermedius*, Norm., but, as the authors point out, it differs slightly in colour and distinctly so in the generative system.

W. E. C.

- Bergh, R.—Die gruppe der *Doridiiden*. Mitt. Aus. Zool. Stat. Neapel, 1893, Bd. ii., pp. 107-35, pl. 8.

Several new species of *Doridium*.

- Brazier, J.—Synonymy of and Remarks on old-described Australian Moll., with notes on their distrib. Proc. Linn. Soc., N. S. W. (2), vol. viii., pp. 107-20.

Attention is drawn to the forgotten description by Swainson in a rare and early volume of the *Proc. Roy. Soc. of Van Diemen's Land* of *Astele subcarinata*, lately renamed by Pilsbry *Calliostoma adamsi*; the species is refigured. Poirier is quoted to show that *Murex australis*, Q. and G., is a prior title of the shell better known as *Murex palmiferus*, Shy.

- Clessin, S.—Systematisches Conchylien-Cabinet von Martini und Chemnitz. Lief. 401. Contains pp. 65-88 and pls. 19-21 of *Pholadea*, and pls. 1-3 of *Fistulana* and *Gastrochana*.

Collinge, Walter E.—Description of the Anatomy, &c., of a New Species and Variety of *Arion*. Ann. Mag. N. H., 1893, vol. xii., pp. 252-4, pl. ix.

Description of a new species and variety found at Schull, Co. Cork, Ireland; a form intermediate between *A. lusitanicus*, Mab., and *A. subfuscus*, Drap.

A. flagellus, sp. nov. "The slug alive measured 50 mm. in length, in alcohol 42 mm., with a mantle 13 mm. long. The head is of a bluish-white colour, which gradually darkens or becomes a greyish blue on the tentacles. In the median line of the body a broad, dark, Vandyke-brown coloured band extends from the caudal gland to the mantle, and becomes less distinct after passing over about half the length of the mantle. On either side of the body a narrower light-brown band borders the median one, and this in turn is bounded by another Vandyke-brown band about half the breadth of the median one. The sides of the body and the foot fringe are of a light brownish white, the latter being striped with faint sepia lines. The sole is pale yellow. The rugæ are somewhat oval and flat, separated by deep sulci. The caudal gland is small and inconspicuous."

The principal anatomical characteristics are, the constricted form of the free oviduct and a small flagellum at a point where the retractor muscle is attached to the free oviduct. The oviduct and prostate are much convoluted and have a position different from other species. Other points of difference are noticeable in the hermaphrodite gland and in the alimentary, muscular, and nervous systems.

Var. nov. *phillipsi*. "Whole of the back and mantle of a deep mahogany-brown colour and the sides of the body white with black dashes."

Crosse, H. et Fischer, P.—Diagnoses Molluscorum novorum, Republicæ Mexicanæ incolarum. Journ. de Conchyl., 1893, pp. 110-11.

The following new species are described:—*Auodonta chalcensis*, *Unio distinctus*, *U. soledadensis*.

Dall, W. H.—Prelim. notice of new sp. of *L.* shells from the Galapagos Is., &c. Naut., 1893, vol. vii., pp. 52-56.

Ford, John.—Remarks on a new species of *Cypræa*. Proc. Acad. Nat. Sci., Philad., 1893, pp. 310-12.

Ford, John.—Some (responsive) remarks relative to *Cypræa gregori*, Ford. Naut., 1893, vol. vii., pp. 78-81.

Godwin-Austen, H. H.—On new species of *Alycaeus* from the Khasi and Naga Hill Country, Assam, Manipur, Upper Burmah, and the Nicobars. P. Z. S., 1893, pp. 592-96.

Hedley, Charles.—An Enumeration of the *Janellidæ*. Trans. New Zealand Inst., 1892, pp. 156-62.

The *Janellidæ*, as the author remarks, are a most interesting order, and one "whose extent, distribution, and classification appear to be but little known." Combining, as Mr. Hedley does, the systematist and anatomist in one, we note with much satisfaction the following remarks:—"Classification based upon a single feature has never proved to be natural—that is to say, has never arranged its subjects in the order of their blood-relationship. A classification to be natural should be founded upon the aggregate characters, and the arrangement of the pulmonate Gasteropoda by their jaws must be discarded, to share the fate of every such system since the days of Linné."

There are fourteen valid species enumerated, viz.:—*J. bitentaculata*, Q. and G., 1832; *J. marmorea*, Hutton, 1879; *Anetella virgata*, E. A. Sm., 1884; *Anetella macdonaldi*, Gray, 1860; *A. graffi*, Humbert, 1863; *A. hirudo*, Fischer, 1868; *A. modesta*, Cr. and F., 1870; *Hyalimax perlucidus*, Q. and G., 1832; *H. mauritanicus*, Rang., 1827; *H. maillardi*, Fischer, 1867; *H. reinhardtii*, Mörch, 1872; *H. viridis*, Theob., 1864; *H. andamanicus*, G.-A., 1882, and *Parmarion kersteini*, V. Mts., 1867. The following are mentioned as doubtful: *J. verrucosa*, V. Mts., 1889, probably identical with *J. bitentaculata* v. *papillata*, Hutt., 1879; *J. marmorata*, V. Mts., 1889, perhaps synonymous with *J. marmorea*, Hutt.; and

Neojanella dubia, Ckll., 1891. On this latter genus and species Mr. Hedley makes some rather strong remarks. Personally we consider it doubtful, on the grounds that a new genus and species described from a single alcoholic specimen—and not in the best of condition either—unaccompanied by figures or anatomical details, has no claim to acceptance, and should never have been described.

A new colour variety of *A. graffei* is described, viz., v. nov. *rosea*. "Entire animal coloured bright melon-pink. Summit of Mount Bellenden-Ker, N. Q. (K. Broadbent) and Prosperine River, N. Q. (C. W. de Bergh Birch.)"

There are one or two errors which it will be well to point out. *J. papillata* is wrongly placed as a var. of *J. bitentaculata*, and *J. verrucosa* and *marmorata* are both credited to Von Martens. I speak subject to correction, but think Simroth was the first to describe these.—W. E. C.

Hedley, C.—Notes on *Papuina*. Naut., 1893, vol. vii., pp. 73-4.

Hedley, C.—*Pholas obturamentum*; an undescribed Bivalve fr. Sydney Harbour. Records of Austr. Mus., 1893; vol. ii., No. 4, pp. 55-7, pl. xiv.

Kobelt, W.—System. Conch.-Cab. v. Martini u. Chemnitz, Lief 400 and 402.

Contain pp. 17-56 and pls. 6-17 of the *Achatinidae*: the only novelty is *Pseudachatina gravenreuthi*, Bttgr., from the Cameroons.

Kobelt, W.—Diagnosen neuer palæarktischer Arten. Nachr. Deutsch. Malak. Gescl., 1893, pp. 150-53.

Marshall, J. T.—Additions to "British Conchology." Journ. Conch., 1893, pp. 241-265.

A valuable contribution to our British shells. One or two criticisms may be made however. *Trochus magnus* v. *conica*, Mar., appears identical with v. *producta*, Bucquoy, Dautzenberg, and Dollfus, which is described as narrow, spire very elevated and umbilicus very small; this species is of course not a true *Trochus*. *Rissoa pulcherrima* v. *pellucida*, Mar.; there is a v. *concolor*, B. B. and D., described as yellowish white without markings, these two can hardly both stand. On *R. cingillus* v. *graphicus*, it may be remarked that while the yellowish form is found at Weymouth, the white is abundant at Portland. *Eulima philippii* v. *tumidosa*, Mar.; the author states that "This variety I had originally named in MS. until after the publication of the "Challenger" Report, when I recognised the *E. latipes* of Watson, described and figured therein as the same thing." Surely Mr. Marshall cannot intend to refer *E. latipes* of Watson to his MS. name of v. *tumidosa*. *Cerithiopsis tubercularis* v. *acicula*, Brusina; according to Bucquoy, Dollfus, and Dautzenberg this is v. *subulata*, Wood. *Nassa reticulata* v. *minor*, Mar.; there is a v. *curta*, B. D. & D., squat only measuring 14 millim. *Cypræa europæa* v. *minor*, Mar.; there is already a v. *minor*, Moulerosato. A protest must be entered against these vars. *minor*, *major*, &c.; unless they differ by some other characteristic than size alone, they can surely be of no service, and we shall require a name for every specimen which differs in size from the type. —E. R. S.

Martens, E. von.—Biologia Centrali-Americana: Mollusca. London, 1893, Aug.-Oct., pp. 185-248, pls. 10-12.

These parts deal with *Orthalicus*, *Ostomus*, and part of *Bulimulus*. The spelling is changed from *Orthalicus* on the ground that the derivation should be from *ὄρθαλος*—a young fowl; such an alteration as this, however, is dangerous, as there is another possible derivation which would give *Orthalicus*, and since it is now impossible to be certain which derivation was originally meant it is better to keep to the original spelling. The following are new:—*Orthalicus machura*, *Ostomus trimarianus*, *O. bugabensis*, *O. championi*, *O. moritinctus*, *Bulimulus durangoanus*. The substitution of comparative tables in place of a description of each species is a new and convenient feature. They are not, however, arranged as conveniently as they might be, that of *Bulimulus* for example is placed in the middle of the letter-press relating to *B. schiedianus*, so that on p. 239 we have only part of the references, on p. 240-1 the table of the genus, and on p. 242 the remainder of the references.—E. R. S.

Moellendorff, O. von.—Ueber den Werth des Deckels für die Systematik. Nach. Deutsch. Malak. Gesell., 1893, pp. 137-147.

Moellendorff, O. von.—Materialen zur Fauna der Philippinen xi. Die Insel Leyte. Ber. Senck. Nat. Ges. Frankf., 1893, pp. 51-154, pls. iii.-v.

The new species are too numerous to detail here. A new section *Concuplecta* is created (type *Euplecta scalarina*, Pfr.) for some species of *Trochonanina* from the Philippines, such as *rotundata*, Semper; and from the South Seas, such as *tongana*, Quoy. *Ceratopoma* is a new section of *Helicina* for *H. caroli*, Kob.; it is near *Geophorus*, but is distinguished by a less acute keel and by its not being agglutinous, the operculum is simple, thin, and corneous. Other new sections of *Helicina* are *Pleuropoma* (type *dichroa*, Mildf.), and *Subfurina* (type *citrina*, Gould). About thirty species are noted as peculiar to the island, which seems to be most nearly related to Cebu; though, as the author remarks, this may be due to the small species in the Cebu fauna having been more thoroughly worked than most of the other islands.—E. R. S.

Pilsbry, H. A.—Prelim. note on the species of *Strobilops*. Naut., 1893, vol. vii., pp. 56-7.

Pilsbry, H. A.—Illustration of Mexican Melanians. *Ibid.*, pp. 61-4, pl. iii.

Pilsbry, H. A.—A New Gastropod from New Jersey. *Ibid.*, pp. 67-8, pl. iii.

Pilsbry, H. A.—A Synonym of *Leptothyra*. *Ibid.*, p. 84.

Gabb's genus *Petropoma*. (*Journ. Acad. Nat. Sci. Philad.*, viii., p. 281.)

Scharff, R. F.—A new Irish species of *Arion*. Irish Nat., 1893, vol. ii., p. 302.

Dr. Scharff thinks that *A. flagellus*, Clge., is only a variety of *A. subfuscus*. Most of the anatomical features are overlooked. The constricted oviduct is ascribed to the passage of ova, and the flagellum is—very wrongly—thought to be a portion of the retractor muscle. (See Collinge, W. E., p. 10.)

Simroth, H.—Ueber die von Herrn Dr. Stuhlmann in den Inneren von Ostafrika gesammelten Nacktschnecken. Berich. d. Naturf. Gesell. zu Leipzig, Feby., 1893.

Smith, Edgar A.—Descrs. of six new species of Land-Shells from Annam. Proc. Malac. Soc. Lond., 1893, vol. i., pp. 10-13, 3 figs.

Smith, Edgar A.—Note on *Cypræa gregori*, Ford. Naut., 1893, vol. vii., pp. 64-5.

Sowerby, G. B.—Descrs. of fifteen new shells of the family *Pleurotomidae*. P.Z.S., 1893, pp. 487-92, pl. xxxviii.

Pleurotoma 8, *Daphnella* 3, *Defrancia* 2, *Cythara* 2.

Sowerby, G. B.—Notes on the Genus *Carinaria*, with an enumeration of the species, and the descr. of a new form. Proc. Malac. Soc. Lond., 1893, vol. i., pp. 14-16, 4 figs.

Sowerby, G. B.—Descr. of a new species of *Cancellaria* from Penang. *Ibid.*, p. 27, fig.

Sterki, V.—Observations on *Vallonia*. Proc. Acad. Nat. Soc. Philad., 1893, pp. 234-79.

An enlarged edition of his monograph in the *Manual of Conchology* (ser. 2 vol. viii.).

Sykes, E. R.—On the *Clausilie* of Sumatra, with descrs. of two new species and a variety. Proc. Malac. Soc. Lond., 1893, vol. i., pp. 28-30, 3 figs.

Suter, Henry.—Prelim. Note on Tasmanian Land-Shells. Naut., 1893, vol. vii., pp. 77-8.

Suter, Henry.—Contributions toward a Revision of the Tasmanian Land Mollusca. Naut., 1893, vol. vii., pp. 87-90.

Tate, Ralph.—On some new sp. of Austraban Marine Gasteropoda. Trans. Roy. Soc. S. Aust., vol. xviii., pp. 189-97, pl. 1.

The new species belong to *Sipho* 1, *Columbella* 1, *Cerithiopsis* 1, *Bittium* 1, *Torinia* 1, *Turbo* 1, *Clanculus* 2, *Thalotia* 1, *Calliostoma* 1, *Euchelus* 5.

Vayssiere, A.—Note sur les coquilles de l' *Homalogyra polyzona* et de l' *Ammonicera fischeriana*. Journ. de Conchyl., 1893, pp. 106-9, pt. of pl. v.

Webster, G. W.—*Strobila hubbardi*. Naut., 1893, vol. vii., p. 94.

PHYSIOLOGY, HABITS, AND CONDITIONS OF LIFE.

Coupin, H.—La faune des Conduites d'eau. Le Nat., 1893, p. 261.

Coupin, H.—Sur l'élimination des matières étrangères chez les Acéphales et, en particulier, chez les Pholades. Comptes Rendus, 1893, vol. cxvii., pp. 373-6.

D [all]. W. H.—Hæckel's Planktonic Studies. Naut., 1893, vol. vii., pp. 86-7.

Hornell, James.—On the habits of the Octopus in captivity. Journ. Mar. Zool., 1893, vol. i., pp. 9-11.

Webb, W. M.—On the manner of feeding in *Testacella scutuluni*. Zool., 1893, vol. xvii., pp. 281-9, pl. i.

Mr. Webb records a series of very interesting and careful observations upon a subject which previously has been anything but clear.

Webb, W. M.—The Method of Feeding in *Testacella*. Zool., 1893, vol. xvii., p. 356.

SPECIAL FAUNA AND DISTRIBUTION.

Anon.—Zur Molluskenfauna des nordwestlichen Persiens. Nachr. Deutsch. Malak. Gesel., 1893, pp. 148-9.

Baldwin, D. D.—Catalogue of the L. & F. Shells of the Hawaiian Islands. Honolulu, 1893.

Deals of course principally with *Achatinella*. There is a list of synonymy given which will prove useful; more care might have been taken, however, to investigate the relative antiquity of the names.

Billingham, F. L.—Notes on the L. & F. M. of Castlemaine and neighbourhood. Victorian Nat., 1893, pp. 61-64.

Boettger, O.—Die Marinen Mollusken der Philippinen (II.). Nachr. Deutsch. Malak. Gesel., 1893, pp. 153-67.

Deals with *Eulima*, *Subularia*, *Mucronalia*, *Niso*, and *Stylifer*: the new species are *Eulima* 6, *Niso* 1, and *Stylifer* 2.

Brazier, John.—Catal. of the Marine Shells of Australia and Tasmania. Pt. III. Aust. Mus., Sydney, 1893, pp. 45-74.

Contains the genus *Murex*.

Brazier, John.—Note on *Cassidix wyvillei*, Watson, from the Solomon Isles., Proc. Linn. Soc., N.S.W., ser. 2, vol. viii., p. 43.

Extends the range of this "Challenger" species from the Philippines to the Solomon Is.

Clapp, Geo. H.—*Vitrina limpida* in Pennsylvania. Naut., 1893, vol. viii., pp. 94-5.

Clarke, W. J.—*Viviparus contectus* still living at Askern. Nat., 1893, p. 304.

Cockerell, T. D. A.—*Vallonia americana*, Ancey, MS. Naut., 1893, vol. vii., p. 94.

Collinge, Walter E.—On the occurrence of *Arion lusitanicus*, Mab., in the British Isles, and Descri. of 4 New Varieties. Ann. Mag. N.H., 1893, vol. xii., pp. 414-15.

Recorded from Bovihenen, Bantry Bay, Ireland, where it was collected by Mr. H. Burnley Rathborne.

The new varieties described are:—"*rufescens*, var. nov. Whole of body a dark red. Sides of body bandless. Sent with type by Mr. Rathborne."—"*nigrescens*, var. nov. Described from a black specimen from Ireland."—"*olivaceus*, var. nov. Various shades of olive-green." Mentone.—"*flavo-griseus*, var. nov. Yellowish grey. Foot-fringe usually lighter than the body." Mentone.

The term *nigrescens* also includes plumbeous-coloured forms from Mentone.

Cooper, J. E.—Note on *Helix pisana* in the Channel Is. Journ. Conch., 1893, p. 265.

Cooper, J. G.—On the L. and F. Mollusca of Lower California. Proc. Calif. Ac. Sci., 1893, vol. iii., pp. 207-17 and 338-44, pls. xiii.-xiv.

The total now known is 54, of which a large proportion are *Bulimuli*. The following are new:—*Melaniella? Eiseniana* (a curious sinistral species which appears to be a link between *Stenogyra* and *Cylindrella*), *Planorbis antensis*, and *P. peninsularis*.

Crouch, Walter.—On the Occurrence of *Crepidula fornicata* in Essex. Proc. Malac. Soc., Lond., 1893, vol. i., p. 19.

Dollfus, A.—*Thracia papyracea* sur les côtes du Calvado. Feu. des Jeun. Nat., 1893, p. 15.

Dumas, M. l'abbé.—Les Moll. de l'Allier. Rev. Sci. d. Bourbonnais et du centre d. l. France. Ann. 6, Nos. 11-12, pp. 202-6.

Fierke, F. W.—*Viviparus contectus* at Askern. Nat., 1893, p. 304.

Gain, W. A.—The present Summer Conchologically. Brit. Nat., 1893, p. 189.

Gain, W. A.—The Mollusca of Nottinghamshire. Brit. Nat., 1893, pp. 224-6 and 233-40.

One or two slips have been made in the varieties of the slugs, thus *A. imperatorum* v. *cinerea*, Rbk., should be *cinerascens*, Ckll.; *bicolor*, Rbk., should be *bicolor*, Moq. *A. subfuscus*, Drap., and *A. intermedius*, Norm., v. *plumbeus*, Clige., are omissions. Mr. Taylor's account of the first typical *Amalia gagates* is very amusing.—W. E. C.

Girard, A.—Révision de la faune malacologique des îles Thomé et du Prince. Journ. d. Sci. Ac. Real d. Sci., Lisbon, 1893, T. 3.

Hanham, A. W.—Land Moll. observed in the Gaspé Region. Naut., 1893, vol. vii., pp. 65-6.

Hidalgo, J. C.—Obras Malacológicas. Entrega 3. Mem. Real. Ac. de Cien., Madrid, 1893.

This part reprints a large portion of the author's papers on the Mollusca of Central America.

Kennedy, William.—*Ianthina rotundata* at Portrush. Irish Nat., 1893, p. 277.

Knight, G. A. F.—Contrib. towards a List of the M. Moll. of the upper portion of L. Linnhe, Argyllshire. Journ. Conch., 1893, pp. 232-7.

Latchford, F. R.—Conchology. Ottawa Nat., 1893, p. 182.

Milnes, Herbert.—List of the L. and F. S. of Derbyshire. Journ. Conch., 1893, pp. 274-88.

Monks, Sarah P. San Pedro as a Collecting Ground. Naut., 1893, vol. vii., pp. 74-77.

Peck, J. I.—Rpt. on the Pteropoda and Heteropods coll. during the voyage of the "Albatros." Proc. U.S. Nat. Mus., 1893, vol. xvi., pp. 451-66, pls. liii.-lv.

Pteropods were dredged at seven stations and taken in surface collections at six. Those found in dredging are frequently different to the surface species at the same place; this is probably due to the ocean currents carrying the light shells some distance. *Cavolinia* was by far the best represented genus found. At the deepest dredging in which pteropods were found, viz., 1,019 fathoms off the E. of Sth. America, a large deposit of "pteropod ooze" was discovered; in which the only Heteropod was *Atlanta peronii*. A species of *Carinaria* was also found, but the surface collections are not thoroughly worked out; and for the curious reason "of convenience" the Gasteropod *lanthina* is included in this report, a circumstance which will probably result in the remarks being overlooked by most students of the Gasteropoda. The outline drawings are poor.—E. R. S.

P[ilsbry], H. A.—*Acanthochites exquisitus*, Pilsbry. Naut., 1893, vol. vii., pp. 95-6.

Pleas, E.—Shells of Henry Co., Indiana. Naut. 1893, vol. vii., pp. 68-70.

Praeger, R. Lloyd.—*Helix Arbustorum*, L., in Leitrim. Irish Nat., 1893, p. 302.

Roebuck, W. D.—*Limax cinerioniger*. Nat., 1893, p. 280.

Scharff, R. F.—*Testacella scutulum*, Sow. Irish Nat., 1893, vol. ii. p. 253.

Scharff, R. F.—*Helix rufescens* in Belfast. *Ibid.*, p. 277.

Scharff, R. F.—Rare Shells from co. Sligo. *Ibid.*, p. 301.

Scharff, R. F.—*Helix fusca* in co. Dublin. *Ibid.*, p. 302.

Scharff, R. F.—Note on the Geographical Distribution of *Geomalacus maculosus* Allman, in Ireland. Proc. Malac. Soc. Lond., 1893, vol. i., pp. 17-18, map.

Standen, R., and Hardy, J. R.—The L. and F. Moll. of Oban, &c. Journ. Conch., 1893, pp. 266-74.

Stearns, R. E. C.—Report on the Mollusk-fauna of the Galapagos Islands with Descriptions of new species. Proc. U.S. Nat. Mus., 1893, vol. xvi., pp. 353-459, pls. li.-lii.

The report, occupying nearly a hundred pages, is much inflated with remarks compiled from other authors on such subjects as to the length of time snails can subsist without food, agency of winds in distribution, &c., and the original work would go into a much smaller space. For instance, the catalogue of the "Albatross" shells is gone through, and then in a general summary, embracing other authors' work, all the species are listed again. Mr. Stearns is to be congratulated on having grouped no less than ten pseudo-species under *Bulinulus nux*.

On the whole, it is an exhaustive summary of what is known respecting the fauna of these islands.

The "Albatross" work added 59 species to the fauna, about 15 of which were new: why, however, the paper should be headed "with descriptions of new species," when all of them have been described elsewhere, we are left to guess.

E. R. S.

- Tate, R.**—Some Additions to the List of Mar. Gastropoda of S. Australia. Trans. Roy. Soc. S. Aust., vol. xviii., pp. 198-202.
Addenda to and notes on Adcock's list (see *Conchologist*, 1893, vol. ii., p. 182).
- Taylor, J. W.**—*Hyalinia nitida* v. *albida*, Jeff., in Tipperary. Journ. Conch., 1893, p. 231.
- Taylor, Geo. W.**—L. and P. W. Shells in the Rocky Mountains. Naut., 1893, vol. vii., pp. 85-6.
- Warren, Amy.**—*Trochus duminnyi* and *Odostomia delicata* on the Irish Coast. Irish Nat., 1893, pp. 252-3.
- Warren, Amy.**—*Helix rufescens* in the North of Ireland. *Ibid.*, p. 301.
- Winkley, H. W.**—The Sheepscombe River. Naut., 1893, vol. vii., pp. 81-83.
- Wood, W. M.**—On a Collecting trip to Monterey Bay. *Ibid.*, pp. 70-71.

PALÆONTOLOGY.

- Ammon, L. v.**—Die Gastropoden fauna des Hochfellen-Kalkes und über Gastropoden-Reste aus Ablagerungen von Adnet, von Monte Nota und den Raibler Schichten. Geognost. Jahreshft., 1892 (1893), pp. 161-219, figs.
Many new species.

- Anon.**—Illustrations of new Cretaceous Shells. Naut., 1893, vol. vii., pp. 51-2, pt. of pl. ii.

- Bigot, A.**—Contributions à l'étude de la faune jurassique de Normandie. 1er. Memoire: Sur les Trigonies. Mem. Soc. Linn. Normandie, 1893, vol. xvii., pp. 259-343, pl. viii.-xvii.

- Brusina, S.**—Sur la découverte d'une nouvelle faune dans les conches tertiaires à Congeria des env. de Zagreb (Agram) et sur ses relations avec la faune récente de la Mer Caspienne. Proc. Congrès Internat. Anthropol. &c., Moscow, 1893, pp. 9.

Records a species of *Limax* and several new species of non-marine mollusca.

- Campbell, John H.**—Descr. of a new fossil *Cyprina*. Naut., 1893, vol. vii., p. 52, pt. of pl. ii.

- Hutton, F. W.**—The Pliocene Mollusca of New Zealand. Macleay Mem. Volume, 1893, pp. 35-92, pls. vi.-ix.

This monograph enumerates 251 species of marine fossils, none of which are new. Some are briefly redescribed. In four quarto plates 95 species are represented by zinc engravings. The Pliocene beds are restricted in New Zealand to the south of the North Island. From 23 to 37 per cent. of their contained mollusca are extinct, and 12 of their genera are absent from the present fauna, though still in existence abroad. Since the recent species are, as fossils, the most abundant, and the extinct the rarest, it would appear that in Pliocene seas the present molluscan fauna was establishing itself at the expense of an earlier fauna.

C. H.

- Hyatt, Alpheus.**—Phylogeny of an acquired characteristic. Amer. Nat., 1893, vol. xxvii., pp. 865-77, pl. xviii.

Refers to the fossil Cephalopoda.

- Tate, R., and Deunant, J.**—Correlation of the Marine Tertiaries of Australia: Pt. i., Victoria. Trans. Roy. Soc. S. Aust., vol. xviii., pp. 203-26.

- Woehrmann, S. v.**—Ueber die systematische Stellung der Trigoniden und die Abstammung der Nayanen. Jahrb. K. K. Geol. Reichsanst., vol. xliii., pp. 1-28, 2 pls.

Both groups, according to the author, retain their respective former places in the series near each other. The arrangement is made entirely to turn on the hinge structure. No anatomy quoted!

BIOGRAPHICAL.

J.[ohnson], C. W.—In Memoriam—Robert Walton. Naut., 1893, vol. vii., pp. 90-1.

Shone, Wm.—George Wm. Shrubsole, F.G.S. Nat., 1893, pp. 336-40, and portrait.

Winkley, Henry W.—Charles B. Fuller (obit.) Naut., 1893, vol. vii., p. 58.

EDITOR'S NOTES.

We extend a very hearty welcome to the "Proceedings of the Malacological Society of London," the first part of which consists of thirty pages of letter-press, two plates, and thirteen woodcuts.

We believe it is the intention of the Council to issue at least four such parts per year, which alone are well worth the small subscription the society asks. No working malacologist can afford to be without such a publication, and Editor, Secretary, and Publication Committee may indeed feel proud of their first effort.

We have received from the Academy of Natural Sciences of Philadelphia, U.S.A., a copy of an address to the various scientific bodies with which it is in connection, requesting the same to memorialise their respective governments in favour of allowing objects of natural history to travel through the post at the same rates of postage as samples of merchandise.

All students of the Mollusca will be pleased to learn that Dr. Pelseneer's new work ("*Introduction à l'Etude des Mollusques*") is now almost ready. It will be published by M. Lamertin, of Brussels, in 1 vol., 8vo., 146 figs., price 6 fr.

We much regret to hear that our contemporary, the *Midland Naturalist* has ceased to exist. At the same time we welcome what promises to be a practical and interesting paper, the *Journal of Marine Zoology*, a plainly-worded biological quarterly, edited by Mr. James Hurrell, of the Jersey Marine Biological Station.

Mr. Arthur Willey, B.Sc., has been elected to the Balfour Scholarship of Cambridge University, and will proceed to New Ireland to investigate the early development of *Nautilus pompilius*.

Mr. Charles Ashford, of Christchurch, Hants, died suddenly on January 31st, in his 66th year. Mr. Ashford was a skilled dissector of the Mollusca, and there are few, if any, of the British Land and Freshwater Mollusca whose anatomy he was not acquainted with. One of his best known papers is that on the Anatomy of the Darts and Dart-sacs of the *Helicidae*.

Mr. Hugh Fulton has just acquired a very fine specimen of the extremely rare *Pleurotomaria beyrichii*, Hilgendorf, from Japan. This makes the sixth specimen known of that species (three of which are very imperfect), and the sixteenth recent specimen of the genus.

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Vol. III.

ON A CASE OF PROTECTIVE RESEMBLANCE
AMONG SLUGS.

BY G. SHERRIFF TYE,

Handsworth, Birmingham.

I WISH to call attention to the very remarkable likeness existing between *Arion hortensis* and *Agriolimax agrestis*, and portions of the bloom sheath of the black poplar (*Populus nigra*, L.).

On April 12th, while in the garden, I noticed what I took to be a number of these slugs lying among what I knew to be the bud-sheaths of the poplar overhanging my fern-house. They were close against the garden tiles along the edge of the lawn; there had been some rain and the ground was damp. I thought this a fair opportunity for giving our pet thrush and blackbird a treat, so I "went" for these slugs, but was surprised to find that I had been deceived—they were poplar bud sheaths.

In thinking upon the matter the conclusion was forced upon me that in the slugs we have a strong case of protective mimicry.

Not all the sheaths—perhaps 30 per cent.—bear a wonderful, I might almost say an exact likeness of either one or other of the species named, and all bear such a semblance as to act as an efficient concealment to the slugs when lying among them. The fact that only a percentage were so truly slug-like lent greater point to the concealment.

Sometimes the smaller portion (lower) of the sheath, which adheres by the gummy secretion of the bud to the larger upper and inner part—giving the mantle to the false slug—falls off, yet even then, for a time at least, until age darkens it, the lighter part where it was inserted carries out the deception.

Where the semblance is most perfect we get the keel, pallial line, sometimes the corrugated surface, occasionally the partly extended tentacles, the darker lines often seen on *A. hortensis*, sometimes the curve of the body sideways, as in the act of turning, and in one case I noticed a sheath had fallen on the edge of a brick, and it was scarcely possible to believe it to be other than a slug with its head bent over in the act of passing the angle.

The natural exudation of resinous gum—which has a somewhat pleasant odour—gives a rather shiny appearance to the sheaths even in dry weather, and when they are wet this slug-like appearance is enhanced.

It sometimes happens that the bloom falls off with two parts of the sheath attached, then the husk looks exactly like a slug feeding on the peduncle of the flower.

It is perhaps worthy of remark that activity among the slugs is coincident with the fall of these bloom-sheaths, at a time when concealment is useful to them on account of the increased energy of their natural enemies, the thrushes, who, after a winter's abstinence from such dainties, are more than usually alert, having young to provide for.

It is true slugs are where poplar trees are not—but the case I cite is probably one out of many, which further observations will elicit.

If we consider the general colours of slugs, sombre greys and browns, we can readily see how curled leaves, sticks, sheaths, &c., help them against their foes—a flash of deception has many a time passed through my mind by seeing some such object which looked like a slug.

“I know a bank,” a sweet bank by Warwick’s “soft flowing Avon,” where, in the gloaming, a pale *A. agrestis*—a species which is very plentiful there—creeping up a grass stem looks like a cocoon of the five spotted Burnet-moth (*Zygana trifolii*). At such times when the sun is not shining, the mind, through the eye, is easiest deceived in man, and probably in beast too. The little *A. bourguignati*, when you find it under a log or stone “humping itself,” looks like a grey pebble, and the great *Limax maximus* seems at first glance something more villainous than a slug to other eyes than ours, perhaps.

These are bald notes on a subject of great charm to a naturalist, showing how life has struggled and worked to one great end—to fit itself to its environment.

ON THE JAMAICAN SPECIES OF VERONICELLA.

By T. D. A. COCKERELL, F.Z.S.,

Professor of Entomology and Zoology,

R. R. LARKIN,^{AND}

Student of '94, New Mexico Agricultural College, U.S.A.

In the *Check-List of Slugs*, p. 219, it was stated that descriptions had been made of several Jamaican *Veronicella*, which seemed to be distinguished by not altogether unimportant characters; but these were not published, owing to uncertainty regarding the specific value of the distinctions observed. The present paper results from an attempt to definitely determine the value of these distinctions in the separation of species.

The material here discussed is wholly from Jamaica. It consists of 18 specimens recently dissected (numbered 1 to 18), and various others (numbers from 19 to 24, some numbers including more than one specimen) examined in Jamaica—the latter being those referred to in the *Check-List*.

The 18 specimens lately examined were all sexually mature except Nos. 6, 12, and 15, which three, perhaps only by accidental coincidence, were all very dark in colour. Unfortunately the precise locality-records of these specimens have been lost, but it is believed that most came from Kingston, and a few (including No. 2) were sent by Mrs. E. M. Swainson from Bath.

The results obtained are quite remarkable, and tend to throw doubt on the validity of several characters hitherto used for the separation of species in the genus; it has therefore seemed well to state them rather fully.

In the first place, it may be said that none of the specimens now reported on show the characters of *V. dissimilis*, nor does it seem possible to associate any of them with *V. jamaicensis* (Semper's supposed *kraussii*). *V. dissimilis*, Ckll., characterised by its very long (12 to 18 mm.) filiform glands, and the form of the penis-retractors is doubtless the same as Semper's supposed *sloanii*, although Semper's slug differs in colour from the types of *dissimilis*. This species is undoubtedly distinct from the true *V. sloanii*, Cuv.

The specimens show great differences from one another, so that by selecting a few of the most distinct forms, several apparently good species might be described.* Yet we believe that the whole series

* As stated above, several supposed species had been indicated by one of us in MS. It may be added that three of these (*virgata*, and specimens supposed to be identical with Nos. 22 and 21) were sent to Dr. Simroth, who wrote that he considered them very nearly allied, but still distinct species. Mr. Pilsbry also wrote that he had named a Jamaican *Veronicella* as new in MS., but whether it was another form of *sloanii* cannot be ascertained, as he mentioned no characters.

represents the variations of but one species, *V. sloanii*, and that *V. virgata*, Ckll., must be reduced to *V. sloanii* var. *virgata*. With the details given below, the reader can form his own opinion as to the correctness of these conclusions.

Notwithstanding so much variability, the species *V. sloanii*, as now defined, should be easy of recognition. The following characters appear to be quite constant and of specific value in *V. sloanii*:—

- (1.) The under-side is always free from spots or markings of any kind, whereas true *occidentalis*, Guild., from the Lesser Antilles, has some spots beneath.
- (2.) The sole never projects from behind the body, as it does in one or two of the continental species.
- (3.) The filiform glands are less than 10 mm. long, whereas in *dissimilis* and *floridanus* they are considerably longer.
- (4.) The penis is always long, cylindrical, with the end slightly bulbous and the orifice terminal. It thus entirely differs from that of such species as *V. portoricensis*.
- (5.) The filiform glands are always more than 10 in number, thus differing from *V. morchii* and *V. dubia*.
- (6.) The female orifice is always postmedian, thus differing from the continental *V. nigra*, &c.

Aside from these constant characters, we find the most extraordinarily variability, both as to colour, size, and anatomical features.

Variable Characters.

- (1.) Size: sexually mature examples (in alcohol) range from 36 to 71 mm. in length, from which it seems certain that the slugs grow after reaching sexual maturity.
 - a. Nos. 19, 7, 21, 20, 17, 22, and 16 are less than 40 mm. long.
 - b. Nos. 5, 8, 11, 10, 24, 13, 18, and 14 are 40 or over, but less than 50 mm. long.
 - c. Nos. 9, 4, 1, and 3 are 50 or over, but less than 56 mm. long.
 - d. No. 2 is 71 mm. long.

A comparison of the descriptions will show that size cannot be correlated with other characters so as to serve for specific distinction. It is, however, remarkable that the largest specimen (71 mm.) has the shortest ($3\frac{1}{2}$ mm.) filiform glands.

- (2.) Shape: the shape varies somewhat in the contracted slugs, but no essential difference is noticed between any of the specimens.
- (3.) Colour: contrary to the opinion of some authors, colour seems as useful as most other characters in distinguishing species and races of *Veronicella*; but there is great variability, and

what particular forms of coloration can be used, is only to be learned by experience. Thus, the variety *coffea*, found at moderately high altitudes, is so far as observed sufficiently constant in colour to be readily recognised. The var. *virgata*, distinguished by less marked peculiarities of colour, is always constant so far as noticed. Doubtless in both cases intergrades will be found, but it is probable that several such local races of *V. sloanii*—indicating the first steps toward the formation of species—will be found in Jamaica when a thorough search is made. Such local races will present variations among their members, but the average characters of each will be found to be different, though one may intergrade with another where their areas join. Among the specimens lately examined, three (Nos. 18, 2, and 9) were observed to be very conspicuously speckled, and we thought a distinct variety might be indicated. They agreed very nearly in the number of filiform glands, but in the length of the glands they disagreed, and after comparing their characters in detail, we gave up all idea of separating them under a distinct name. In this case, apparently, the colour character was of no use for purposes of classification.

In the descriptions given below, the colour-characters are often given in italics, to draw attention to contrasts in this respect between anatomically-similar slugs.

- (4.) Distance of female orifice from head: varying from 51 (Nos. 15 and 8) to 60 (No. 9) of total length. These variations cannot be correlated with other characters.
- (5.) Distance of female orifice from sole: varying from $\frac{1}{2}$ mm. to 2, or (in the specimen of 71 mm. long) $2\frac{1}{2}$ mm. It is doubtful whether these variations have much significance.
- (6.) The penis is quite variously curved and twisted, the position it assumes when the animal is killed being probably accidental. Its length varies from $4\frac{1}{2}$ (No. 7) to 13 (No. 16) mm. The smaller measurement probably denotes some immaturity, although No. 16, which had the longest penis, was a slug only 1 mm. longer than No. 7.
- (7.) The penis retractor may be described as short and thick, but it is commonly attached to a stout transverse fascia, which represents its two divergent tendons. Such a condition is described below as two retractors, though it might be more correct to say retractor two-headed. In certain specimens

(e.g. Nos. 8 and 9) this condition does not obtain, and the retractor is strictly *one*. It surprised us to find that this difference (*whether* one or two retractors) could not be correlated with other characters, and was apparently of no specific value.

In *V. dissimilis* the two penis-retractors are distinct, long, and slender; and here the character has specific value.

- (8.) The filiform glands vary in number from about 20 (Nos. 20, 22, and 23) to 47 (No. 10), but from 30 to 35 is the usual number. In length they vary from $3\frac{1}{2}$ (No. 2) to 9 mm. The alimentary canal was found to be practically the same throughout. Some variation was observed in the foot-nerves, but the nervous system was not studied.

We have no doubt that the species is identical with *V. sloanii*, which is the same as Blainville's *V. lævis*—the type of the genus. Mr. C. D. Sherborn was so kind as to ascertain the approximate date of publication of Cuvier's work, from which it appears certain that the name *sloanii* antedates *lævis* by some months, though both were published in 1817.

Veronicella sloanii (Cuvier), *Table of Variations*.

A. Filiform glands 9 mm. long.

- a. Two retractores penis; filiform glands 36; penis slightly curved, cylindrical, end bulbous, orifice terminal, length $7\frac{1}{2}$ mm.

Length (in alch.) $45\frac{1}{2}$ mm., breadth 14 mm., breadth of sole 5; ♀ orifice 27 mm. (.59 of total length) from head, 1 mm. from sole. Ends rounded, head retracted, end of sole not projecting beyond body. Mantle dirty yellow, with *no well-defined median line and no spots*; slightly warty. Beneath pale yellowish-brown, sole concolorous; cross-lines of sole numerous and small. = No. 5.

- b. One retractor penis; filiform glands about 20; ♀ orifice .56 of total length from head; mantle with a pale median-line and *dark subdorsal bands*. = *virgata*, Ckll.

B. Filiform glands $8\frac{1}{2}$ mm. long, 35 in number, one of them branched; penis cylindrical, end bulbous, orifice terminal, length 10 mm.; length of slug (in alch.) 55, breadth 15, of sole 8 mm.; ♀ orifice 33 mm. (.60 of total length) from head, 2 mm. from sole.

Head slightly protruded; mantle *distinctly mottled dark brown and dirty yellow*, no median line. Beneath pale yellow, sole concolorous, cross-lines of sole numerous, irregular. = No. 9.

4'. Filiform glands 7 mm. long.

a. One retractor penis; filiform glands 28.

a¹ Penis 11 mm. long, retractor 3 mm.; footnerves going apart 14 mm. from head; intestine 80 mm. from buccal mass to ♀ orifice; receptaculum seminis globular, dark, 4 mm. diameter, with duct 12 mm. long.

Length (in alch.) 37 mm., breadth 11½, sole breadth 4, ♀ orifice 22 mm. from head, and ¾ from sole; cross-lines on sole alternating large and small, about 35 to 38 large ones in 10 mm. of sole. Found by Dr. Henderson in Kingston. = No. 19.

a² Penis straight, cylindrical, and bulbous, orifice terminal; length 9½ mm.

Length (in alch.) 48½ mm., breadth 14½ mm., breadth of sole 6 mm.; ♀ orifice 25 mm. (51 of total length) from head. Head retracted, sole not projecting beyond body. Mantle slightly mottled, prevailing colour dirty yellow; an ill-defined pale median line; beneath pale yellow. Cross-lines of sole well-defined and regular; about 16 in 5 mm. of sole. = No. 8.

b. Two retractores penis; filiform glands 30 or more.

b¹ Penis 10 mm. long; filiform glands 30.

Length (in alch.) 50 mm., breadth 14½, of sole 5. Female orifice 28 mm. (56 of total length) from head, 1 mm. from sole. Head retracted. *Mantle dark brown with a well-defined median-line*, and an ill-defined dirty yellow mottling. Beneath pale yellowish-brown. About 16 well-defined cross-lines in 5 mm. of sole, with many smaller lines. = No. 4.

b² Penis considerably twisted; filiform glands 32.

Length (in alch.) 49 mm., breadth 16, of sole 6. Female orifice 28.7 (57 of total length) from head, 2 mm. from sole. Head retracted. *Mantle dirty brownish-yellow, with an ill-defined median line*. Beneath pale yellowish-brown, sole very slightly darker. Cross-lines of sole numerous, regular and well-defined. = No. 11.

b³ Penis twisted, 11 mm. long; filiform glands 47.

Length (in alch.) 49½ mm., breadth 16, of sole 6. Female orifice 26 mm. (52 of total length) from head, 2 mm. from sole. Head retracted. *Mantle dirty brownish-yellow, with a well-defined median-line*, and ill-defined darker mottling. Beneath pale yellowish-brown, sole slightly darker. Cross-lines of sole numerous, irregular. = No. 10.

D. Filiform glands 6 mm. long.

- a. Length (in alch.) 52 mm., breadth 15 mm., breadth of sole 7 mm.; female orifice 29 mm. (.55 of total length) from head, from sole $1\frac{1}{2}$ mm. Colour—mantle above *pale coffee brown, with ill-defined pale median line*, dark bands barely indicated towards posterior end. Ill-defined greyish marking all over. Beneath pale coffee brown, paler than above, sole of same colour. Mantle rugulose, finely granular. About 34 cross lines in 10 mm. of sole, intermediate small lines obscure, more than one between each two principal lines.

Filiform glands 26 in number. Penis cylindrical, twisted, end bulbous, orifice terminal, length nearly 9 mm., 2 retractors penis. Duct of receptaculum seminis 11 mm. long. = No. 1.

- b. Length (in alch.) 36 mm., breadth $14\frac{1}{2}$ mm., breadth of sole 6 mm., female orifice 20 mm. (.55 of total length), from sole 1 mm. Mantle above, *mottled with dark brown and dirty yellow, no median line*. Beneath pale coffee brown, sole same colour. Cross lines of sole deep and well defined, about 10 in ten mm. of sole with many small intermediate lines; lines quite irregular.

Filiform glands 34 in number. Penis straight, cylindrical end bulbous, orifice terminal, length $4\frac{1}{2}$ mm., retractors 2. = No. 7.

- E. Filiform glands about $5\frac{1}{2}$ mm. long, and 24 or 25 in number, the inner ones shorter. Penis retractor single, rather short and stout. Penis much curved, when straightened measuring about 8 mm. Receptaculum seminis with a convoluted duct, about 11 mm. long.

Length (in alch.) 37 mm.; alternating strong and weak cross-lines on sole, 50 strong ones in 10 mm. of sole. Found in Kingston by Mr. J. J. Bowrey. This slug has *bands, but no pale middle-line*. = No. 21.

- F. Filiform glands about $5\frac{1}{2}$ mm. long, and 24 in number.

Length (in alch.) 42 mm.; sole breadth 4 mm.; female orifice 24 mm. from head, 1 mm. from sole. *Mantle with spots, but no bands*. Jaw dark, ribs weak. Found in Kingston by Mr. Bowrey. = No. 24.

- G. Filiform glands 5 mm. long.

- a. Filiform glands in a short thick tuft, about 19 in number. Penis 7 mm. long, with a short retractor. Receptaculum seminis globular, dark grey-brown, 5 mm. diam., with a convoluted duct about 10 mm. long.

Length 39 mm., breadth $9\frac{1}{2}$, breadth of sole $3\frac{2}{3}$; female orifice $1\frac{1}{3}$ mm. from sole, 21 mm. ($\cdot 53$ of total length) from head. *Mantle dark above, with obscured spots, underside whitish, in strong contrast.* Apparently viviparous. Found in Kingston by Mr. Bowrey. = No. 20.

- b. Filiform glands 36, two of them branched. Penis $8\frac{1}{2}$ mm. long.

Length (in alch.) 42 mm., breadth $11\frac{1}{2}$, of sole 5; female orifice 25 mm. ($\cdot 59$ of total length) from head, 1 from sole. *Mantle mottled dirty black and brownish yellow, with an ill-defined median line; beneath pale yellowish-brown, sole concolorous.* Cross-lines of sole irregular, small = No. 13.

- c. Filiform glands 38. Penis 10 mm. long.

Length (in alch.) 42 mm., breadth 13, of sole 5; female orifice 23 mm. ($\cdot 54$ of total length) from head, 1 from sole. *Mantle, mottled dirty brown and yellow, with a well-defined median line.* Cross-lines of sole regular, about 20 in 5 mm. length of sole. = No. 18.

- H. Filiform glands $4\frac{2}{3}$ mm. long, 31 in number.

Length (in alch.) 38 mm., breadth 12 mm., of sole $4\frac{1}{2}$ mm.; female orifice $22\frac{1}{2}$ mm. ($\cdot 56$ of total length) from head, from sole 1 mm. *Mantle above, dirty brown with a well-defined lighter coloured median line. Beneath pale coffee brown, sole same colour.* Sole with the cross lines numerous, small, and fairly regular. Penis somewhat recurved, cylindrical, end bulbous, length 8 mm., two retractors. = No. 17.

- I. Filiform glands 4 mm. long: no well-defined middle-line on mantle.

- a. Filiform glands about 20, in a short thick bundle. Penis retractors two, divergent at an angle of about 30 degrees, connected by a membrane; penis about 12 mm. long, cylindrical. Receptaculum seminis with a convoluted duct about 10 mm. long. The two footnerves widely apart opposite the female orifice.

Length (in alch.) $38\frac{1}{2}$ mm., female orifice $\frac{2}{3}$ to 1 mm. from sole, $\cdot 54$ to $\cdot 58$ of total length from head. *Mantle above dark, mottling and middle-line obscure.* Apparently viviparous. Found in Kingston by Mr. Bowrey. = No. 22.

- b. Filiform glands 31, several of them branched; penis 8 mm. long, retractor single.

Length (in alch.) 43 mm., breadth 12 mm., of sole 4 mm.; female orifice 24 mm. ($\cdot 55$ of total length) from head, 1 mm.

from sole. Mantle mottled blackish and brownish-yellow, with an ill-defined median line. Cross-lines of sole irregular. = No. 14.

- c. Filiform glands 35, two of them branched; two penis retractors, penis 13 mm. long.

Length (in alch.) 37 mm., breadth 10 mm., of sole $4\frac{1}{2}$ mm.; female orifice 21 mm. ($\cdot 56$ of total length) from head, 1 mm. from sole. Colour as in the last. Cross-lines of sole fairly regular. = No. 16.

- d. Filiform glands 36; two penis retractors, penis much twisted, 9 mm. long.

Length (in alch.) 50 mm., breadth 17 mm., of sole 6 mm.; female orifice 28 mm. ($\cdot 56$ of total length) from head, 2 mm. from sole. Colour above dark brown, no well-defined middle-line, but distinct mottling. = No. 3.

- J. Filiform glands 35 mm. long, number 33.

Length (in alch.) 71 mm., breadth 22 mm., of sole 9 mm.; female orifice from head 38 mm. ($\cdot 54$ total length), from sole $2\frac{1}{2}$ mm. Colour of mantle dark brown, with well-defined mottled appearance of greyish yellow and pale median line, beneath pale yellowish brown, sole concolorous. About 14 well-defined cross-lines in 5 mm. of sole, with many smaller intermediate ones. Retractors, penis two, blue in colour. Penis straight cylindrical, end bulbous, orifice terminal, length $10\frac{1}{2}$ mm. = No. 2.

ADDITIONS AND AMENDMENTS TO THE SLUG LIST.

No. II.

By C. HEDLEY, F.L.S.,
Australian Museum, Sydney.

THE closing pages of "The Conchologist" invited comments under the above title. So I avail myself of the opportunity to remark that Prof. Cockerell's exhaustive list of the names that have been applied to various kinds of slugs represents a labour only to be appreciated by those who are used to the search of literature. Its value is considerable and its use to students manifold.

Affording another instance of what Mill called the tendency of mankind to mistake words for things, it is to be hoped that this huge and cumbersome mass of synonyms may serve the purpose of an

impaired rook in a cornfield, and frighten, by so shocking an example, later naturalists from inventing more names to be thus gibbeted.

Every name being but a symbol for the thing it stands for, should be fully explained upon its first appearance. A biological term without a definition is like an unstamped coin. Therefore I refuse recognition to empty names like *Cystopeltinae*, Ckll., and *Otoconchinae*. Ckll., for the reason that I would refuse to accept a blank sheet of paper tendered as a bank note.

The high standard set up by Mr. Collinge in the appendix, viz. :—that a species undescribed as to its animal and anatomy be refused recognition, is too lofty an ideal to be practicable and too hard to receive general consent. A lesser reform—that recognition be henceforth withheld from unfigured species—would be more feasible.

Descending to minor points, I regret that in my note on *N. dubia*, in the *Trans. N. Z. Inst.*, I did not make my meaning sufficiently clear. I thought and still think that it belongs to “[one of] the preceding species,” which one I do not know, though my friend, H. Suter, recognises *J. bitentaculata* in it.

I gather from Prof. Cockerell's remarks that from *Janella*, *Neojanella* is distinguished by lack of impressed dorsal grooves and by superior size. Now in badly-prepared *Janellidae*, and the shrivelled head of *Neojanella*'s type indicates a bad preparation, the dorsal grooves are apt to disappear. Indeed, it was the absence of this fugitive feature which induced Humbert to create his *Triboniophorus*. Maintaining his genus, Mr. Cockerell should logically revive Humbert's, from which, in fact, no published feature divides his own. As to size, the New Zealand *Janellae* attain far larger dimensions than the text books quote. I have before me an undoubted *J. papillata*, which, even in alcohol, reaches a length of 55 mm.

Prof. Cockerell argues that because “In Gray's type of *antipodarum* the genital organ protrudes . . . the slug is mature,” i.e., full grown. This seems a debatable point. Is artificial protrusion by death, in media which relax the buccal and genital muscles, a proof of sexual maturity? Is a slug known to be sexually mature, necessarily full grown?

Of my “enumeration,” Prof. Cockerell says, “Indeed the whole paper contains no new fact, except the description of the interesting variety on p. 161.” To defend my friends of the New Zealand Institute from the imputation of having squandered their substance on printing an almost worthless essay, I am driven to claim that, *inter alia*, I proposed an original classification of the family. In contrast with the usual grouping of the family as instanced by

Mr. Cockerell's scheme in the P. Z. S., 1891, p. 215, *Janellida* was freed from the *Succineida* and amplified by the inclusion of the *Hyalimacinae*. These radical changes seemed improvements to my critic, for he incorporated them in his Check List.

It is rightly stated by Prof. Cockerell that *H. maillardi* occurs in Bourbon; in error I had quoted it from the Mauritius. The date, author, and locality of *J. verrucosa* and *marmorata* were transcribed exactly from a separate copy of the paper which the author, Dr. Simroth, had himself presented to me. Though the niceties of authorship and publication are perhaps more correctly distinguished by Mr. Cockerell, yet since the Auckland Islands are politically, geographically, and biologically as much a part of New Zealand as the Isle of Wight is a part of Great Britain, I must still adhere to my "mistake" of reckoning these slugs among Novozelanian animals.

Species 305 and 328 should be indicated as fossil by square brackets, both date from 1880. In the present edition dates are promiscuously applied or omitted; should a second edition appear its value would be augmented by the dating of all names. Such dates benefit the reader by showing priority at a glance and also aid a search for description.

ADDITIONS AND AMENDMENTS TO THE SLUG LIST.

No. III.

SINCE the List was published a number of corrections and additions have occurred, which are given below.

"The three following species are to be added to the List, having been unintentionally omitted:—*Limax natalianus*, Mikhaehs, 1892; *Lytopelta transcaspia*, Rosen., 1892; *Ly. boettgeri*, Rosen., 1892."—T. D. A. C. *in litt.*

Page 168—For "museum" read "museums." Page 168—For "varietal character" read "varietal characters."

Page 170—" *Limax*: syns. *Gestroa*, Pini, 1876. *Chromolimax*, Pini, 1876. *Opilolimax*, Pini, 1876. (The authority and date were omitted in the List."—T. D. A. C. *in litt.*)

Page 170—*L. fasciatus*, Raz. "L. and P. consider, apparently with good reason, that *fasciatus*, Raz., is a variety of *ater*; while *fasciatus*, Moq. (though Moquin-Tandon considered it to be the same as *fasciatus*, Raz.) is a var. of *maximus*, and a different thing. I would therefore make the following change:—

1a. *fasciatus*, Pic., 1840.

czeruawii, Kal.

1b. *moquini*, Ckll. (new name).

fasciatus, Moq. (nec Pic., nec Raz.).—T.D.A.C. in litt.

Page 171—2d, "authority should be L. and P."

Page 171—5e, *pironæ* has a syn. *typus*, L. and P.

Page 171—9, syn. *cinereus*, 1776, should be 1774. Add syn. *vittipes* (pars.) Bon. MS. in L. and P. Page 171—9j, should be *pavesii*. Add syn. ? *efasciatus*, D. and M. Page 171—10b, for "Beth." read "Bett."

Page 172—10u should be *erytrus*. 10x is a syn. of *geographicus*, not a var. 19c, for "*sienesis*" read "*senensis*." 19ii, *doriæ* add syn. *vittipes* (pars.) Bon. MS. in L. and P. 20, *a* and *c* should be subv. of *b*, and *e* a subv. of *d*.

Page 173—44k, syn. *maculatus* for "1856" read "1855."

Page 175—97b should be in italics.

Page 175—For "*Messolimax*" read "*Mesolimax*." 106, for "*Pallidula*" read "*pallidula*." 108, for "*barypus*" read "*baripus*." Page 175—"120k is the same as *q*, and *q* is practically the same as *w*. At all events the same figure (Fér., pl. v, f. 8) is quoted for *rufescens*, *ornatus*, and *obscurus*."—(T. D. A. C. in litt.)

Page 176—141, for "*camanae*" read "*carronæ*." 153, for "*brinneus*" read "*brunneus*."

Page 187—218, for "*beccaria*" read "*becarii*"; for "*Cryptibyei*" read "*Cryptibyci*." 223, should be *pallens*. 270, should be *comorensis*.

Page 188—For "*Phancroporus*" read "*Phaenoporus*." 288, syn. should be *alta-ripæ*. 292, syn. should be *galloprovincialis*. 294, syn. should be *bisulcata*.

Page 189—326, for "Benout" read "Benoit." 354 should be *aterrima*. 363-5, for "Shuttl" read "Shuttl."

Page 190—367u, "*olivaceus*, Lehm. I expect it is *olivaceus*, Schm. See 386, f. i., and p. 210."—T. D. A. C. in litt.

Page 190—372e, for "*griseus*" read "*flavo-griseus*."—(W. E. C.)

Page 191—376k, for "Kock" read "Koch." 380, for "1882" read "1822." 392, syn. should read *moitessierianus*.

Page 192—408, for syn. "*viridus*" read "*viridis*." 408, syn. read *onguiformis*. 422, add *a* before *flavum*. It is a var. not a syn. 433 should be *hemphilli*.

Page 193—434, for "Booc" read "Bosc." 467 should read *chaudoensis*.

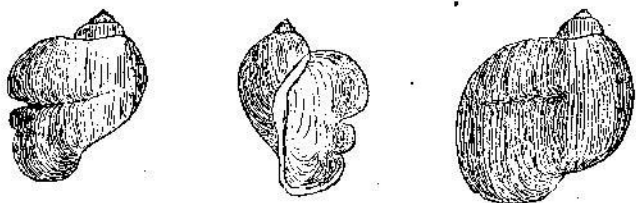
- Page 194—533-45-66, *æ* should be *æ*.
- Page 195—*Hyalimax*, dele. comma after A. (H. and A. Ad.) 593, *Othelosoma symondsii*, Gray, to be omitted, see L. v. Graff, Zool. Anz. xv., p. 7.
- 618, for "Raug" read "Rang." 619 should be *perlucidus*.
- Page 196—Line 6, for "Ffr." read "Pfr." Note 7. Am Stein's *v. albus* is not an albino, notwithstanding its name. (T. D. A. C. *in litt.*)
- Page 198—Line 9, for "1849" read "1884."
- Page 201—*A. agrestis* v. *ornatus*, Moq. "I believe this is really *L. fulvus*, No. 38."—(T. D. A. C. *in litt.*)
- Page 203—*P. gervaisii* dele. "from Gibraltar." "It was without locality and is not found at Gibraltar."—(T. D. A. C. *in litt.*)
- Page 207—Line 7, for "1879" read "1789"; line 10, for "*lutes*" read "*luteo*"; line 26, for "Pollonero" read "Pollonera," 366f, for "1812" read "1886." 367a, read *jonstonii*. 367b, for "1885" read "1855."
- Page 209—For "372e" read "372f."
- Page 211—Line 2, dele. comma after *fide*. 385, for "*Limacellus concava*" read "*Limacella concava*."
- Page 213—*L. cinctus*, for "band and back" read "mantle and back."
- Page 218—*V. coffea* in descr. twice read "fasciate" for "fusciate," and dele. comma after "middle line."
- Page 220—*V. lucia*, for "fitted" read "pitted."
- Page 221—For "Simper" twice read "Semper."
- Page 226—*N. dubia*, line 9 from bottom, after "I have" insert "examined."
- Page 228—First line read *bourguignati* = *fuscus* var.

NOTE ON LIMNÆA AURICULARIA.

By E. R. SYKES, B.A., F.Z.S.

THROUGH the kindness of Capt. Turton, R.E., I have had placed in my hands a small collection of freshwater molluscs, which were obtained by him in the Davos Lake, Switzerland, at an altitude of nearly 5,000 feet. They belong to more or less well-known species and their interest lies in the fact that many of the specimens of *Limnæa auricularia* show a remarkable deformation. At the edge of the outer lip there is in several cases a notch (occasionally two) with generally a "line of weakness" or well marked line running back half a whorl

or more and cutting the striæ of growth at right angles so as to interrupt them. Some specimens show only a line of injury to the striæ of growth and no notch, others again have had a notch which has been filled up and the subsequent growth has gradually become of a normal character. Mr. Collinge found, some years ago, specimens



of *Limnæa stagnalis* which, from sketches he has sent me, appear to have been affected much in the same way.

Now how is this to be accounted for? There are too many specimens for the injury to be attributable to accident. Can the deformations then be due to some injury to or disease of the mantle which is common to all? This seems hardly likely as the deformation seems to be spasmodic, sometimes increasing and again decreasing till the growth is normal, while at other times it increases until a notch is found which remains at the edge of the lip. No attachment of weed will explain these in the same manner as sufficed for some *Littorina* which I examined recently.* They cannot be due to the pseudo-parasitic *Nais* or *Gordius* as these take up their position between the neck and mantle and so would not injure the shell-growth. The following extract† is of interest and suggests a clue. "M. Brot has observed, in a lake near Geneva, a deformation affecting nine-tenths of the specimens of this species (*L. peregra*) and consisting in a deformation of the base of the columella. This lake contained at the same time an extraordinary abundance of *Hydra viridis*. A year later not a single specimen of *Limnæa* was abnormal and since then not a deformed shell has been observed in the lake. At the same time *Hydra viridis* had totally disappeared. Is then the *Hydra* the cause of this deformation? One cannot affirm it; nevertheless the coincidence is striking."

The *Hydra* theory then seems the most possible though one cannot regard it as proved, and the following may be suggested as the mode of causation. That on the attachment of the *Hydra* its powers of annoyance cause the sensitive mantle to shrink from the spot while

* Pro. Dorset N. H. and A. F. Club. xiii. (1892), pp. 191-3, pl.

† Pro. Verb. Soc. Mal. Belg. vi. (1887), p. xlvi.

on its death or departure the mantle gradually closes up the injury and returns to a normal deposition. I append rough sketches showing the appearance of the shell with the notches and interrupted striae of growth.

THE MALACOLOGICAL SOCIETY OF LONDON.

Feb. 9th, 1894.—Dr. Hy. Woodward, F.R.S., in the chair.

The Report and Balance-sheet for 1893 were submitted and adopted, and the Officers and Council for the ensuing year elected.

The following were elected members of the Society:—
Baron Jules de Guerne, R. J. L. Guppy, J. H. Hart, Dr. H. Simroth, and Bryant Walker.

The following communications were read:—"On the Land Shells of W. Australia and the neighbouring Islands," by E. A. Smith, F.Z.S.; "Description of new Chinese *Clausilia*," by Dr. O. Boettger and B. Schmacker. The original collection of Shells formed by Linné was on exhibition.

March 9th, 1894.—Dr. Hy. Woodward, F.R.S., in the chair.

The following were elected members of the Society:—
Prof. R. Tate, C. Quaife, Dr. J. C. Verco.

The following communications were read:—"On the value of *Ancylastrum*," by Charles Hedley, F.L.S.; "Revision of the British Eocene *Cephalopoda*," by R. Bullen Newton and G. F. Harris, F.G.S.; "Description of new Chinese *Clausilia*," (Part 2), by Dr. O. Boettger and B. Schmacker; "On the South African *Polyplacophora*," by E. R. Sykes, B.A., F.Z.S.

April 13th, 1894.—W. H. Hudleston, M.A., F.R.S., in the chair.

The following were elected members of the Society:—
D. J. Adcock, E. W. Howell, A. H. Christie, S. C. Clapham, R. F. Damon, Major-Gen. L. Tripe.

The following communications were read:—"Notes on the variation and habits of *Schizoglossa novoseelandica*," by R. Murdoch; "Descriptions of Marine Shells from the neighbourhood of Hong Kong;" "Note on *Verticordia eburnea*; of which *V. optima*, recently published, is a synonym," by G. B. Sowerby, F.Z.S.; "Note on *Natica sordida*," by H. K. Jordan; Notes on *Buccinum undatum*, by H. K. Jordan, G. W. Chaster, G. F. Harris, and E. R. Sykes.

May 11th, 1894.—Dr. Hy. Woodward, F.R.S., in the chair.

The following were elected members of the Society:—
T. H. Haynes, W. L. S. Loat, Rev. G. F. Whidborne.

The following communications were read :—"On a small collection of Land and Freshwater Shells from Oman, Arabia," by E. Smith, F.Z.S. ; "On the Anatomy of *Pterocera*, with some notes on the Crystalline Style," by M. F. Woodward ; "Descriptions of Marine Shells from the neighbourhood of Hong Kong," by G. B. Sowerby, F.Z.S. ; "Notes on the Anatomy of *Bulimus glaber*," by S. Pace.

NOTES.

Limax maximus in the City of Mexico.

Dr. A. Dugès has just sent me a good specimen of *L. maximus*, marked "Ville de Mexico." This is a new locality, but of course it is an introduction. The example is of fair size, blackish, with three pale ochreous lines down the back ; the mantle is uniformly blackish except for some pale marbling near its anterior edge ; the sole is uniformly pale ochreous.

While on the subject of *L. maximus*, I may draw attention to an error in the Check-List. The peculiar variety *bielzi*, with red slime, should be credited to Seibert instead of to Sinroth, being the same thing as *L. bielzi*, Seib., No. 52 of the Check-List.—T. D. A. COCKERELL, Las Cruces, N. Mexico, March 18th.

CURRENT LITERATURE.

In order to make the following Bibliography as complete as possible, the Editor invites the co-operation of British and foreign authors. All communications should be addressed to the Editor, the "Journal of Malacology," Mason College, Birmingham, England.

MALACOLOGY IN GENERAL.

Hickson, Sidney J.—The Fauna of the Deep Sea. London : Kegan Paul. pp. i.-xii., and 1-169, illustrated.

Dr. Hickson's little book will be read with pleasure by all interested in zoology. It is full of interest, delightfully written, and well printed and illustrated.

The references to the Mollusca are as follows :—Pages 62-3 and p. 119, Colour of Deep-sea Molluscs ; pp. 71-2, Eyes of Deep-sea Molluscs ; p. 83, on the absence of lime in bathybial Molluscs.

Pelseneer, Paul.—Introduction à l'Étude des Mollusques, 8°, Bruxelles, 1894, 216 pp., 146 text illust. [Extrait des Mém. Soc. R. Malac. Belgique (1892), xxvii.]

Malacologists generally will be greatly indebted to Dr. Pelseneer for this most admirable text-book, which summarises for them the principal points in the anatomy of the chief groups and even families of the Mollusca.

Unfortunately it is only brought down to the beginning of 1892, having been prepared for that year's volume of the "*Mémoires de la Société Royale Malacologique de Belgique*," which society must be held responsible for the delay, and consequent depreciation of the work, now two years old ; indeed, their volume from which it professes to have been extracted has not yet been issued.

Fortunately for the author, this delay has not proved so serious as might have been expected, and any modifications necessary will doubtless be made in future editions ; what these modifications may be, the student can readily gather for himself by consulting the annual volumes of the Zoological Record.

The "Introduction" is, of course, written purely from a zoological and not from a mere conchological point of view. It begins with a summary of the

structure, &c., of the Mollusca as a whole, and then deals with each class or subclass, beginning with the Amphineura and ending with Cephalopoda, and giving a succinct account under each, of its—(1) Morphology, (2) "Ethologie" or, as we should say, Bionomics, (3) Bibliography, and (4) Systematic Arrangement.

The book abounds in illustrations in the text, very many of them being quite new. In the future editions, which we feel sure will be soon required, they will probably be printed darker and so show to more advantage, while we would suggest that the numbers used to indicate the several parts or organs should be made to correspond; it is rather trying, when comparing several illustrations, to have to remember that some portion, say the gill, is No. v. in one figure, xi. in the next, xiii. in the third, and so on.

It is a work to get and to read carefully before relegating it to one's shelves for future reference.—(BV²).

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. i., pt. 58; ser. ii., pt. 34. Philadelphia. Academy of Natural Sciences.

In the Marine series, part 58 completes the monograph of the *Polyplacophora*. In noticing the completion we may ask why the group is not called *Polyplaxiphora* since this was Blainville's original term? If it is necessary to amend this name, why then should Mr. Pilsbry use Gray's generic name of *Plaxiphora*? Either Blainville was right and his name should be used, or he was wrong, and then Gray's generic name requires emendation.

In noticing the Land series, it is impossible in our space to consider the subgeneric names; we shall therefore only note the genera. This part continues *Pyramidula*, and *Patula* is used only for the North American forms on the ground of the priority of the former. We then pass through *Pararhytida* to *Physanophora*, then to *Sagda*, of which a key is provided; this would be of more use if *S. jayana* and *S. lamiuifera* did not appear in more than one section of it. *Zaphysemia* is a new genus (type *Helix tenerrima*, C. B. Ad.) for some Jamaican species. Next to *Praticolella* and on to *Polygyra*, with its numerous sections. Then through *Polygyrella* and *Polygyratia* to *Pleurondonte*, which latter is resurrected to contain *Caracolus*, *Isomeria*, and other groups. Finally through *Camana* and *Obba* to *Planispira*.—E. R. S.

STRUCTURE AND DEVELOPMENT.

Babor, J., and Kořál, J.—Příspěvky ku poznání poměrů pohl u některých Limicidů.

Sitz. Gesel. d. wiss. Math.-Nat. Prag., 1893, pp. 1-7, T. xx.

An exceedingly interesting paper and very carefully illustrated. The authors have compared a number of specimens of *Agriolimax* and *Malacolimax*; and figures are given of what are termed new species, but they are as yet unnamed. We would suggest before naming and describing as new species, that the exact form of the generative organs should be noted in both in and out of the breeding season, as many of the differences seem capable of being accounted for by distension, &c., rather than true morphological distinctions.—W. E. C.

Collinge, Walter E.—The Myology of some Pulmonate Moll. considered as a distinctive feature in the discrimination of genera, &c. Proc. Malac. Soc. Lond., 1894, vol. 1, pp. 52-54.

Collinge, Walter E.—The Anatomy and Description of a new Species of *Arion*. Ann. Mag. N. H., 1894, vol. xiii., pp. 66-7, pl. v. A.

Description of a new species found at Wainsgrove, Somersetshire, by Mr. E. W. Swanton.

Arion elongatus, sp. nov. "Head and tentacles blackish, the latter slightly lighter than the head. Centre of mantle marked with a pyriform mass of deep black, bounded on either side by a narrow yellowish-grey line, below by a deep black band which gradually shades off into a yellowish-grey. Whole of dorsal surface a deep black, bounded, like the mantle, by a yellowish-grey line, then

a deep black band, which shades off into a yellowish-grey. Foot-fringe yellow with sepia lineoles. Sole yellowish; lateral planes distinct from medium plane, which latter is marked in a dendritic manner and slightly lighter in colour. Rugae large and flat. Respiratory orifice distinct. Keel absent, the back being almost flat. Length alive, 24 mm.; length in alcohol, 15 mm.; length of mantle in alcohol, 5 mm."

The principal anatomical characters are:—the absence of any sharp distinction between sperm-duct and vas deferens, the enormous size of the free oviduct, which dilates into a sac-like body at about a third of its length, and then constricting passes into a pouch-like portion to which the retractor muscle is attached.

Haller, B.—Beitrage zur Kenntniss der Placophoren. *Morph. Jahrb.*, 1894, xxi., pp. 28-39, T. ii.

Koford, C. A.—On Some Laws of Cleavage in *Limax*. *Proc. Acad. N.S.*, Phil., 1894, pp. 180-203, pls. 1-2.

This is a preliminary communication giving the results of a study of cleavage in *Limax*. A number of very interesting results have already been obtained, which we regret want of space forbids us recapitulating.

Lillie, F. R.—Preliminary account of the Embryology of *Unio complanata*. *Journ. Morph.*, 1893, vol. viii., pp. 569-78, pl. xxviii.

Some preliminary remarks on the segmentation and gastrulation. The work has been undertaken with the two following objects, of which fuller details are promised in a later paper:—(1) "To settle definitely the question of the origin of the germ layers in the *Unionide*, and (2) to extend the cytogenetic method in embryological research to the class of the Lamellibranchs.

Nabias, M. B. de.—Recherches Histolog. et Organologiques sur les centres nerveux des Gastropodes. *Act. L. Soc. Bordeaux*, 1894, xlvii., pp. 11-202, pls. i.-v.

Nobre, Augusto.—Observacoes sobre o systema nervoso e affinidades zoologicas de alguns pulmonados terrestres. *Ann. de Sci. Nat.*, Porto, 1894, vol. i., pp. 17-20 and 75-78, pl. iii.

We shall have occasion at a later date to review this interesting paper in some detail, so will merely note that the present parts contain an introduction and an admirable account and figure of the nervous system of *Arion lusitanicus*, Mab.

Suter, Henry.—On the Dentition of *Pella burnupi*, Melvill and Ponsonby. *Ann. Mag. N. H.*, 1894, vol. xiii., pp. 60-1., pl. v. B.

VARIATION.

Carrington, John T.—Four Abnormal Shells. *Sci. Goss.*, 1894, p. 64, 4 figs.

Mason, P. B.—Variation in the Shells of the Mollusca. *Journ. Conch.*, 1894, pp. 328-46.

Taylor, J. W.—Abnormal *Clausilia perversa*. *Ibid.*, p. 327.

Taylor, J. W.—*Succinea oblonga*, n. *sinistrorsum*. *Ibid.*, p. 367.

CLASSIFICATION, NOMENCLATURE, NEW GENERA AND SPECIES.

Ancey, C. F.—Sur quelques espèces de Moll. et sur un genre nouv. du lac Tanganyika. *Bull. Soc. Zool.*, France, 1894, vol. xix., p. 28.

Lechaptosia is a new name for *Horea*, Smith, 1889 (*non* Bourg., 1888).

Ancey, C. F.—Etudes sur la Faune des îles Sandwich: Monog. du genre *Cardia* et description d'un *Microcystis* nouv. *Mem. Soc. Zool.*, France, 1894, vol. vi., pp. 321-30.

Boettger, O.—Die Binnenschnecken der griechischen Inseln Cerigo und Cerigotto. Nachr. Deutsch. Malak. Gescl., 1894, pp. 1-12.

Boettger, O.—Einer neuer *Amphidromus* aus Borneo. *Ibid.*, pp. 66-7.

Glessin, S.—Beschreibung neuer Arten aus der Umgebung des Issykkul-See's. *Ibid.*, pp. 64-6.

Crosse, H. et Fischer, P.—Diag. Moll. novi, Republicæ Mexicanæ incolæ. Journ. de Conchy., 1893, p. 179.

Dautzenberg, Ph.—Moll. nouv. recueillis au Tonkin. *Ibid.*, pp. 157-65, pl. vii-viii.

Dautzenberg, Ph.—Descr. d'un Moll. nouv., provenant du Congo Francais. *Ibid.*, pp. 166-7, pl. of pl. viii.

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Ford, J.—Some Final Remarks Relative to *Cyprea gregori*. Naut., 1894, vol. vii., pp. 130-1.

Mr. Ford is evidently of opinion that rude personalities strengthen his argument. Such trivial and childish nonsense reflects no credit on the writer, editor, or paper.

Hedley, Charles.—A new *Papuina*. *Ibid.*, p. 136, fig.

Marshall, J. T.—Additions to "British Conchology." Journ. Conch., 1894, p. 379.

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Ponsonby, J. H.—On a new species of *Helix* from the Khasi Hills. *Ibid.*, p. 56, fig.

Quadras, J. F. and Moellendorff, O. F. v.—Diagnoses specierum novarum ex insulis Philippinis. Nachr. Deutsch. Malak. Gescl., 1894, pp. 81-121.

Forty-seven new species! All unfigured, and none of them compared with their allies. It is to be hoped that shortly no new species will be accepted in such difficult genera as for example *Omphalotropis*, without figures or at all events more than a bare Latin diagnosis. Species published as these are without any indication of where the types are and without sufficient explanation to render them identifiable should be rejected as "insufficiently described."—E. R. S.

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The specimens came from Lake Mweru, L. Tanganyika, and L. Nyasa, and are the earliest recorded from the first of these lakes. Only one (*Lanistes ovum*)

of the nine species from L. Mweru appears to have been previously described. We are pleased to see that Mr. Smith unites Bourguignat's 26 species of *Plodon* into one. The new species are *Ennea*, 2; *Helix* (*Pella*), 1; *Viviparus*, 2; *Cleopatra*, 2; *Melania*, 4; *Physa*, 1; *Unio*, 1.

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Rolleia, Crosse, is a subgenus of *Choanopoma*. *Pseudocyclotus* is a new genus (type *novæ-hiberniæ*, Quoy); from the radula it is near *Omphalotropis*, but differs in the operculum. *Cyathopoma* is near here rather than in *Cyclophorus*: as also *Garrettia*. *Cyclotopsis* is nearer *Cyclophorus* than *Cyclostoma*, according to the radula.—E. R. S.

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EDITOR'S NOTES.

Mr. Walter Garstang, M.A., Naturalist on the Plymouth Staff of the Marine Biological Association, has recently been elected to a Research Fellowship at Lincoln College, Oxford.

We regret to hear that Mons. A. Locard has written a work on the terrestrial Mollusca of France. We trust it may not prove as useless as his earlier works in the same series as the Marine, Brackish, and Freshwater Mollusca.

Copies of the original descriptions and figures of the Slugs continue to come in from various parts. Will some American student kindly lend assistance?

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NOTE ON ARION CITRINUS, WESTERLUND.

By JOSEPH F. BABOR,

University of Prague.

(Pl. I, figs. 1-5.)

IN August, 1891, I had been in Misdroy on the Wollin Island, and I was fortunate to find amongst numerous specimens of *Arion fuscus*, O. F. Müller, one of *A. citrinus*, Westerl., and as the systematic relations of this form are not as yet definitely established, I will here give the results of the dissection of the above-mentioned specimen. I should state that the real *raison d'être* of this paper is a note in a paper by Collinge¹ for a copy of which I am indebted to the author's liberality.

In its external appearance and the form of the radula my specimen agrees with Westerlund's diagnosis²; it will, therefore, be unnecessary to here repeat it. The anatomy of the digestive and nervous systems, and of the mantle complex show the relations common to the genus *Arion*. Of the reproductive system I will give a more detailed description. The gonade (hermaphrodite gland, ovotestis) is small, ovoid, and of a dark colour, the hermaphrodite

¹ Conchologist, 1893, vol. ii., pp. 113-17.

² Exposé crit., 1871.

duct is rather short and convoluted several times at the end. The albumen gland and ovisperm duct are similar in appearance to those found in *fuscus* and *subfuscus*, Drap., but the terminal ducts are rather remarkable. The rather long vas-deferens (sperm-duct, Scharff) passes in the middle of its length into the portion of the penis in which the spermatophore is formed (=the Patronenstrecke of Simroth³ and sperm-duct of Collinge)^{4,5} entering with its rounded end into the atrium (vestibule) together with the receptacular duct. The receptaculum seminis has a rounded ampulla (head of receptaculum seminis) which is closely connected with the ovisperm duct at the point of its division. The duct is long and thin, expanding suddenly at its base. The free oviduct is short and muscular, so that from its beginning it is rather thick and only becomes larger towards the orifice; in almost its first third there is a small protuberance to which is attached one slip of the retractor muscle, which soon joins with the other slip inserted on the ampulla of the receptaculum seminis. The wall of the oviduct forms on its inner side two strong and two weaker longitudinal thickenings; these in the upper half are divided into a greater number of thinner ones, but pass along the whole length of the free oviduct. In this respect *citrinus* differs from *fuscus*, which has the upper half or third of the oviduct—viz., above the insertion of the retractor muscle—thin; membranous and without the inner thickenings (Längswülste Simroth), which in *fuscus* are developed in the lower part only—viz., beneath the insertion—and that in a reduced number of two (*fuscus* and *brunneus*, Lehmann) or at most three, the additional one being very weak (rarely in *fuscus*, common in *subfuscus*).

One may be inclined to consider this formation of the oviduct as a standard of the development of the genital organs, which, as I have convinced myself,^{6,7} are undergoing, according to the phases of the sexual function, rather remarkable modifications, even in animals which have reached their full size. But I cannot accept this explanation, for numerous specimens of *fuscus* collected at the same time with this *citrinus* fully agreed with it in the development and size of the individual organs, so that it was impossible to observe in any of them (or in the described *citrinus*) a pre-

³ Zeit. f. wiss. Zool. 1895, Bd. 42.

⁴ Conchologist 1892, vol. ii., pp. 56-66.

⁵ Ann. Mag. Nat. Hist., 1893, vol. xii., pp. 252-4.

⁶ Sitz. Gesel. d. wiss. Math.-Nat. Prag., 1893.

⁷ Verh. d. Deutsch. Zool. Gesel. Leipzig, 1894.

ponderance of the one sex above the other. From this I should infer that the above-mentioned condition of the oviduct is characteristic of *citrinus* only; unfortunately, the whole description is from one specimen only. This character is, of course, in no way sufficient for a species, but for a variety of the typical *fuscus*, as Pollonera⁸ and Collinge⁹ have already suggested; but it seems to me that there are already too many unnecessary species of the *subfuscus* group, and that an endeavour should be made to reduce them to a few characteristic species. In this case *citrinus* would probably deserve the rank of a subvariety of *subfuscus*, and *fuscus* as a variety, for I must agree with the opinions of Simroth¹⁰ and Collinge,⁹ that there are not sufficient grounds to rank *fuscus* as an independent species. *A. subfuscus*, there can be little doubt, is a good species, both from its external appearance, especially its *large size*, described by Pollonera,¹¹ and from its anatomy, especially the form of the oviduct, so clearly stated by Collinge¹² and figured by Scharff.¹³

I will finally add that the var. *boettgeri*, Poll., of *fuscus* is always characterised anatomically by a short receptaculum that hardly reaches to the ovisperm duct, and does not grow with it, as we find in *subfuscus* and *fuscus*, which character Pollonera figures,¹⁴ but makes no mention of it in the text, although it is constant and rather significant.

DESCRIPTION OF PLATE I.

Illustrating Mr. Joseph Babor's paper, "Note on *Arion citrinus*, Westerlund."

Fig. 1.—Reproductive organs of *Arion citrinus*, Westerl. ²₁

Fig. 2.—Their terminal ducts from the opposite side. ²₁

Fig. 3.—Inside portion of the oviduct in part × × fig. 2.

Fig. 4.—The terminal ducts of the typical *fuscus*, Müll

Fig. 5.—The terminal ducts of *A. fuscus* v. *boettgeri*, Poll.

⁸ Boll. Mus. Zool. Anat. Comp. Torino, 1890.

⁹ Conchologist, 1893, vol. ii., pp. 113-17.

¹⁰ Loc. cit.

¹¹ Atti della R. Acc. d. Sci. Torino, 1891.

¹² Ann. Mag. Nat. Hist., 1894, vol. xiii., pp. 66-7, pl. v. A.

¹³ Trans. Roy. Dublin Soc., Ireland, 1891.

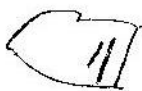
¹⁴ Abh. d. Naturf. Vereine zu Bremen, 1884.

ON TWO CLAUSILIAE FROM SANGIR AND SUMBAWA.

BY E. R. SYKES, B.A., F.Z.S.,

London.

I HAVE recently had placed in my hands through the kindness of Lieut-Col. Godwin-Austen, two species of *Clausilia*, collected by Mr. Doherty. The one from Sumbawa is, I believe, new, and I now describe it under the name of *C. recondita*. The other, which comes from Sangir and the S. Celebes, is in my opinion a form of *C. moluccensis*, von Marts.; the finding of it in Sangir extends the specific range from the Molucca Is. and S. Celebes somewhat to the north. It is perhaps worthy of remark, as bearing on faunal relations, that the Sangir form is more nearly allied to the Molucca Is. form than to that from the Celebes, which, as Prof. von Martens has pointed out,¹ is less strongly striated than the typical form from the islands which give their name to the species: it may be the variety *majuscula*, Tapparone-Canefri.² The Sumbawa shell, though a *Pseudonenia*, appears not to be very nearly related to any Javan species; the deeper water which is entered on between Bali and Lombok, on passing eastward from Java, probably accounts for the difference. The following is the description of *C. recondita*, which is chiefly remarkable for its single *plica palatalis* and very short *plica principalis*.

**Clausilia (Pseudonenia) recondita**, sp. nov.

Testa fusiformis, gracilis tenuiuscula, cornea, nitens; spira elongato-turrita; apex subacutus, non decollatus. Anfr. 10-11 plano-convexiusculi, lente accrescentes, sutura impressa, subtiliter striatuli, ultimus angustior quam antepenultimus, $\frac{1}{3}$ altitudinis testae non aequans. Apertura parva, piriformis, basi recedens, peristoma continuum solutum, expansum, vix reflexum, leviter incrassatum, albidum. Lamella superior obliqua, marginalis; inferior obliqua, spiritaliter recedens, superiori approximata. Plica principalis brevis (2 millim. approx.), plica palatalis unica,

¹ Von Martens in Max Weber, Zool. Ergebn. Reise. Niederlnd. Ind. 1891, Bd. ii, p. 245.

² Ann. Mus. Genov. (1883), xx., p. 171.

$\frac{1}{2}$ *plicæ principalis æquans*. Long. (spec. fig.) 18·8, lat. 3 millim.
 apert. alt. 3·5, lat. 2·5 millim. Long. (spec. max.) 21, lat. 3
 millim.; apert. alt. 3·6, lat. 2·6 millim.

Hab.: Tongo Mts., Sumbawa (Doherty).

The name of these mountains appears to be also spelt Dongo, but the spelling varies with different authors, as indeed does that of nearly all the localities mentioned in this paper.

The landshells known from Sumbawa are as follows:—

Nanina rareguttata, Mousson. Also from Bali, Flores, &c.

N. bimaensis, Mousson. }

N. halata, Mousson. }

These appear to be peculiar to Sumbawa.

* *N. nemorensis*, Müll. Also from Lombok and the Celebes.

* *Amphidromus contrarius*. Also from Flores, &c.

Clausilia recondita. Peculiar to Sumbawa.

NOTES ON THE SPECIES OF PALUDOMUS INHABITING BORNEO.

BY EDGAR A. SMITH, F.Z.S.,

Zoological Department, British Museum, London.

FIVE species of *Paludomus* from Borneo have already been described. Most of these present a very close family likeness; indeed, two of them, *P. luteus*, H. Adams, and *P. moreleti*, Issel, have already been united by Brot. This author's *P. isseli* is a little larger, but lacks the fine decussation of the epidermis which is present in *luteus*. *A. broti*, Issel, is still larger and remarkable for its globose form and extensive aperture. *A. lacunoides*, Aldrich, attains even greater dimensions than *A. broti*, and is distinguished by a peculiar circumscribed "flattened semilunar space" on the left of the columella, beneath the umbilical region. It also, in young examples, exhibits colour bands, a feature which is not present in other Bornean species.

A series of specimens presented to the British Museum by Mr. A. Everett, who also collected them in the Batang Lupar district of Sarawak, do not agree exactly with any of the forms referred to, and consequently it seems advisable, notwithstanding their evident relationship with *P. isseli* and *P. lacunoides*, to regard them as specifically distinct.

* I give these on the authority of Dr. O. Boettger, *in litt.*

It is a case in which we must "lump" all the various forms, considering them as variations of one and the same species, or else divide them up as best we may. Unfortunately there is a difficulty which is constantly confronting the systematic zoologist. A gigantic "lumping" is unphilosophic, but a too minute "splitting" is still worse. The "happy medium" is perhaps the safest course to tread, our decisions being the result of (as far as we can accomplish it) our careful and candid judgment. The Bornean species of *Paludomus* are as follows :—

1. *Paludomus lacunoides*, Aldrich.

P. lacunoides, Aldrich. Journ. Cincinnati Soc. Nat. Hist., 1889, vol. xii., p. 23, pl. iii, figs. 1-10.

Hab. : Borneo.

The exact locality is not stated by Mr. Aldrich, but from the introductory remarks to his paper it is probable that this species occurs at the South-eastern part of the island.

2. *Paludomus broti*, Issel.

P. broti, Issel. Ann. Mus. Civ. Storia Nat., 1874, vol. vi., p. 455, pl. vii, figs. 19, 20.

P. broti, Brot. Conch. Cab. (*Paludomus*), p. 32, pl. vii, figs. 12, 12a.

Hab. : Sarawak.

3. *Paludomus isseli*, Brot.

P. isseli, Brot. Op. cit., p. 31, pl. vii., figs. 7, 7a, 8.

Hab. : Sarawak.

This species was founded on specimens which Issel originally referred to the Indian *P. crassus*, to which it bears a very close resemblance.

4. *Paludomus luteus*, H. Adams.

P. luteus, H. Adams. Proc. Zool. Soc., 1874, p. 585, pl. lxix, figs. 5, 5a.

P. luteus, Brot, partim. Op. cit., p. 46, pl. viii., figs. 11, 11a.

Hab. : Borneo.

Distinguished by its yellow decussated epidermis, and the slightly convex whorls being without any depression or constriction below the suture.

5. *Paludomus moreleti*, Issel.

P. moreleti, Issel. Op. cit., p. 456, pl. vii., figs. 21, 22.

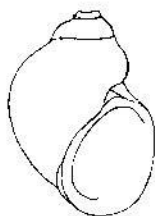
P. luteus, Brot, partim. Op. cit., p. 46, pl. viii., figs. 14, 15.

Hab. : Sarawak (Doria, Beccari, and Hose).

A series of this species presented to the British Museum by Mr. C. Hose contains three or four examples with the spire complete. In this condition it has a very acuminate appearance, the apex being minute and pellucid, if not coated with an earthy deposit.

The almost smooth whorls which are constricted below the suture, the dark olive colour and smaller size, are features which may separate this species from the preceding.

6. *Paludomus everetti*, sp. nov.



Testa globosa, turrita, crassa, epidermide fusco-olivacea induta; spira acuminata, ad apicem sæpe erosa; anfractus circiter 8, convexi, superne infra suturam concave depressi vel constricti, in concavitate lineis spiralibus impressis 2-3 striati, ultimus striis paucis aliis distantibus circa basim distinctioribus sculptus, antice paulo descendens; apertura subovata, longit. totius $\frac{1}{2}$ paulo superans, intus cæruleo-albida; peristoma continuum, subpatulum, in exemplis adultis aurantiacum, in junioribus pallidum, margine dextro obsolete crenulato. Longit. 30 millim., diam. maj. 22, min. 17. Apertura cum perist, 17 longa, 12 lata.

Hab.: Batang Lupar district, W. Sarawak, also Gomanton on the N.E. Coast at Sandakan Bay.

This is a larger and more globose form than *P. isseli*, and differs also from that species in the whorls being concave below the suture, in the spiral impressed lines and the more ovate or less acuminate aperture. Its greatly superior size distinguishes it from *P. moreleti*; the want of colour-bands, and the absence of the "flattened semi-circular space" behind "the columella," may separate it from *P. lacunoides*, which it otherwise resembles in many respects. It appears to exhibit more transverse sculpture, and the orange lip may be characteristic, although I have not seen this peculiarity in any of the specimens from Gomanton.

NOTE ON A SPECIES OF LIMAX FROM IRELAND.

By WALTER E. COLLINGS,

Mason College, Birmingham.

I HAVE recently received from Mr. Jas. N. Milne, Derry, a single example of a large *Limax* which at present I am unable to determine. I have, some short time ago, described a species of *Arion*,* at present

* Ann. Mag. N.H., 1893, vol. xii, pp. 252-4, pl. ix.

only known from Ireland, and I think this is a form of *L. maximus*, possibly sufficiently distinct to be regarded as another species. In the hope that Irish malacologists may be able to supply me with further examples I give the following particulars.

The slug alive measured 136 millim., and has a keel quite as prominent as that of *Limax marginatus*, Müll. The ground colour is a chocolate black with a light brown stripe on the keel—slightly interrupted anteriorly. The tentacles and fore part of the head are minutely spotted with brown. The ventral edges of the mantle and the parts of the body covered by the same, are of a dirty white with irregular sepia blotches. The foot-fringe is black or a very dark sepia, the foot-sole with lateral sepia coloured planes and a median white plane.

Anatomically there seems to be little doubt but that there are sufficient grounds to separate it from any other known species of the genus. I shall later describe and figure the anatomy of the reproductive organs, so will here content myself with pointing out two very prominent characters, viz., (1) the penis is long as in *L. maximus*, but twisted upon itself, and the vas deferens does not arise from the lateral wall as in many members of this genus, e.g., *L. maximus*, L., *L. ater*, Raz., *L. geographicus*, Ren., &c., but is a direct continuation of the penis; (2) the duct of the receptaculum seminalis is more than twice the length of any I have seen in *L. maximus*, the receptaculum is also larger and pyriform.

The very prominent keel and attenuated posterior portion of the body at once distinguishes it from *L. maximus*, while its size separates it from the remaining British or Irish Limaces. When I opened the box in which it was contained it reminded me somewhat of *L. subalpinus*, Less.† Unlike this species, however, it has no trace of lateral bands or marbling on the mantle.

Should I be able to procure more examples I hope to describe and figure it in detail, and name it *Limax hedleyi*, after Mr. Charles Hedley, the distinguished Australian malacologist, to whom I am much indebted for particulars of the slugs of that region.

NOTES.

Description of *Urocyclus flavescens* (Keferst.).

The following notes are based on an examination of some specimens in the British Museum:—

Length (in alcohol) 30½ mm., mantle length 13 mm.; breadth 9 mm., breadth of sole 9 mm. Medium area of sole decidedly narrower than either lateral area. Mantle oval, truncate anteriorly, bluntly angulate or rather subrostrate posteriorly:

† Atti. R. Acc. d. Lincei Mem. Sc., vol. vii., T. ii, fig. 1.

shell-aperture small, and very close to hind end of mantle, no grooves from it to the mantle edge as in *U. kirkii*. Mantle reticulate, the interstices of the reticulation mostly blackish. Respiratory orifice $7\frac{1}{2}$ mm. from anterior border. Mucous pore smallish. Body not keeled, bluish at end. Reticulations large, big blackish grooves (of which there are about eleven, counting from dorsum to sole on one side close to mantle), very little joined by transverse grooves, and not symmetrically arranged on both sides. Sole, &c., ochreous; head, back, and mantle greyish; palish lateral bands on the body, not coinciding with the grooves, but crossed by them. No lateral ridges. A slight indication of dark lateral bands on mantle. Nucleus of shell shiny, yellowish-white.

In a young specimen the bands on the mantle are more pronounced, as figured by Heynemann (*Jahrb. d. Mal. Ges.*, 1884, pl. i).

Delagoa Bay (H. A. Spencer), two specimens.

I was very glad to have an opportunity of drawing up a full description of *U. flavescens* from these specimens. I have no doubt that they are correctly referred to Keferstein's species, and to the genus *Urocyclus* in the strictest sense. *U. kirkii*, Gray from the Zambesi region, *U. pallescens*, Ckll. from Natal, and *U. flavescens*, Keferst. from intermediate localities, form a little group of three allied but distinct species. T. D. A. COCKERELL, F.Z.S., Las Cruces, New Mexico, U.S.A.

CURRENT LITERATURE.

In order to make the following Bibliography as complete as possible, the Editor invites the co-operation of British and foreign authors. All communications should be addressed to the Editor, the "Journal of Malacology," Mason College, Birmingham, England.

MALACOLOGY IN GENERAL.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. i., pt. 59 (vol. xv., pp. 133-180, pl. 18-42); ser. ii., pt. 35 (vol. ix., pp. 113-160, pl. 29-40). Philadelphia: Academy of Natural Sciences (Aug. 1894).

In the marine series, part 59 commences the *Tectibranchiata*, and contains the family *Acteonidae*, in which are included all the allied forms which possess an operculum and a radula of many rows of teeth, all of the same form. The general arrangement followed is that of Fischer. The only new species is *Bullina deshayesi* from Réunion, which may be distinguished from its nearest ally *B. vitrea* Pease, by the columella not being truncated at the base. Slips, such as "Fischer," for "Fischer de Waldheim," and printer's errors, such as "*Acteon*," are too numerous.

In the land series, Mr. Pilsbry continues his history, both conchological and malacological, of the Helicoid groups. The present part deals with fourteen genera including such important groups as *Chloritis*, *Thersites*, and *Papuina*. *Dendrotrachus* is a new section (anatomy unknown) of *Papuina*, which may be distinguished by the columella lip not being expanded or reflexed. The type is *P. helicimoides*, H. & J., and the distribution includes the Solomon Islands, New Hebrides, Admiralty Islands, and New Ireland. As their name implies, the species are arboreal.—E. R. S.

Simroth, H.—Bronn's Klassen und Ordnungen des Thier-reichs. Bd. III. Mollusca. Leipzig, July 1894, pp. 241-336, pl. ix.-xiv.

This part deals almost entirely with the *Polyplacophora* or Chitons. Dr. Simroth gives an interesting résumé of their morphology and ontogeny. The distribution in both time and space is given. Commencing in the Silurian they gradually increase in number up to the present time; the oldest forms being

most nearly related to the recent deep-water *Lepidopleurus*. Barrande's *Triopus* seems however to have escaped his observation. The system of Pilsbry is adopted practically in its entirety, though we cannot help thinking that some more recent part than No. 56 (published a year ago) might have reached Dr. Simroth. A brief general review of the *Amphineura* closes the part in which, *inter alia*, he reviews their relationship with the Annelids and Turbellarians. Printers' errors are rather numerous, and some of the plates of Chitons are lettered as "*Aplacophora*," otherwise the drawings are very clear and distinct. E. R. S.

STRUCTURE AND DEVELOPMENT.

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A description of *P. palliolum*, Fér.
- Kent, W. Saville. Notes on the Embryology of the Australian Rock Oyster (*Ostrea glomerata*). Proc. Roy. Soc., Queensland, vol. vii., pp. 33-49, pl.
- Knower, H. McE.—Pteropods with two separate sexual openings. John Hopkins Univ. Circ., 1894, vol. xiii., pp. 61-62.
- Labbe, A.—Notes de Biologie, I. Accouplement et fécondation chez l'*Octopus vulgaris*, Lam. Arch. Zool. exp. et gen., 1894, T. ii., pp. 21-49, figs.
- Sampson, Lilian V.—Die Muskulatur von *Chiton*. Jena. Zeit., 1894, pp. 460-8, 4 figs.
- Simroth, H.—Über einige Aetherien aus den Kongofällen. Abhandl. d. Senckenb. Nat. Gesell., Frankfurt, 1894, Bd. xviii., pp. 273-88, 1 pl.
- Vayssière, A.—Etude anat. sur le *Coléophysis (Utriculos) truncatula*, Brug. Ann. de la Faculté d. Sci. d. Marseille, 1893, T. iii., pp. 1-13, 1 T.
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VARIATION.

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- Jones, K. H.—Albinism in Mollusca. *Ibid.*, p. 121-2.
- Murdoch, R.—Notes on the variation and habits of *Schizoglossa novoseelandica*, Pfr. Proc. Malac. Soc. Lond., 1894, vol. i., p. 138.
- Sterki, V.—Eine merkwürdige form von *Pupa pagodula*, Desm. Nachr. Deutsch. Malak. Gesel., 1894, pp. 133-4.
- Wetherby, A. G.—A few notes on *Helix tridentata*. Naut., 1894, vol. viii., pp. 43-5.
A timely criticism of the present desire for varietal names.
- Wootton, F. W.—Varieties of *Isocardia cor*. Sci. Goss., 1894, pp. 122-3, 5 figs.

CLASSIFICATION, NOMENCLATURE, NEW GENERA AND SPECIES.

Bœttger, O. and Schmacker, B.—Descriptions of New Chinese *Clausilia*. Proc. Malac. Soc. Lond., 1894, vol. i., pp. 100-117, pls. viii.-ix.

Brazier, John.—On a new *Murex* from S. Australia. Proc. Linn. Soc., N.S.W., 1893, vol. viii., pp. 179-80, fig.

Crosse, H. et Fischer, P.—Diag. Moll. nov. reipublicæ Mexicanæ incolarum. Journ. de Conchy, 1893, pp. 293-7, pl. x.
Six new *Unionide*.

Dall, W. H.—On some species of *Mulinia* from the Pacific Coast. Naut., 1894, vol. viii., pp. 5-6, pl. i.

Hedley, C.—Descr. of *Cæcum amputatum*, an undescribed mollusc from Sydney Harbour. Proc. Linn. Soc., N.S.W., 1893, vol. viii., p. 504 and fig.

Hedley, C.—On the Australasian *Gundlachia*. *Ibid.*, pp. 505-14, pl. xxiv.

The genus *Gundlachia* contains 4 American, 2 Australian, and 1 New Zealand species. *G. beddomei*, Petterd, MS. is described as new from South Tasmania. Figures are given of the animal, lingual ribbon, jaw (now first made clear), &c., of *G. petterdi*, and of the growth stages of the undescribed New Zealand species. Mr. Hedley concludes "The distribution of *Gundlachia* agrees in part with that of the recent Marsupials, and the theory of a Mesozoic or older Tertiary migration to or from Australia across the South Pole, when a lost land with a mild climate united Tierra del Fuego to Tasmania, would explain its present position."

Hedley, C.—On the value of *Ancylastrum*. Proc. Malac. Soc. Lond., 1894, vol. i., p. 118.

Jousseaume.—Descrs. de Moll. nouv. Le Nat., 1894, pp. 167-8.
Two new species of *Cancilla*.

Martens, E. von.—Diag. neuer Arten. Nachr. Deutsch. Malak. Gesell., 1894, pp. 135-6.
A new *Helix* and a *Lippistes*.

Moellendorff, O. F. von.—On a collection of Land-Shells from the Samin Islands, Gulf of Siam. P.Z.S., 1894, pp. 146-56, pl. xvi.

The first collection from these islands, consisting of 32 species, of which 18 are new. The fauna appears to be essentially Malaccan, and consists of *Streptaxidae* (5), *Naninidae* (5), *Helicidae* (2), *Bulinidae* (1), *Stenogyridae* (2), *Pupidae* (3), *Asiculidae* (2), *Cyclophoridae* (6), *Diplommatinidae* (3), *Pupinidae* (2), *Hydrocanidae* (1).

Nobre, Augusto.—Descrip. d'uma nova especie de *Vaginula* de Angola. Ann. de Sci. Nat., Porto, 1894, vol. i., pp. 160-1, Est. viii.

Under the title of *Vaginula simrothi*, Signor Nobre describes a new African species. Figures are given of the slug and also of the nervous and digestive systems. We regret no figure is given of the reproductive organs, such always being useful for comparison. The original description is as follows:—

"Corpus elongatum, vel ovatum, dorsum convexum in speciminibus vero spiritu vine conservatis, subtilissime rugosum. Color obscure olivaceo-viridis, infra pallidore; solea anguste, postice acuminata, media leviter expansa, transverse rugosa; tentaculis anterioribus, parvis, rugosis, posterioribus, parvis, transverse striatis. (Coll. Nobre.)

Long. 42; lat. 23; alt. 12 mill.

Hab.: In Angola, Africae occidentalis.

Corps allongé presque ovale, manteau convexe sur le dos dans les échantillons conservés dans l'alcool, très finement rugueux, entièrement parsemé des petites granulations presque seulement visibles à la loupe sur les bords inférieurs; couleur vert-olivâtre sur le dos et jaunâtre inférieurement. Pied étroit, un peu conique postérieurement et un peu plus élargi vers le milieu de sa longueur, strié transversalement.

Les tentacles supérieurs sont ridés transversalement, bleuâtres, les inférieurs bifides et rugueux comme la peau de la tête.

Longeur du manteau	...	...	...	42 mm.
" " pied	...	...	...	38 "
Largeur du manteau sur le dos	...	...	...	23 "
" " pied	...	...	...	7 "
Hauteur	...	...	...	12 "
Largeur des bords du manteau	...	...	...	6½ "

—W.E.C.

Pilsbry, H. A.—Notices of new Chitons. IV. Naut., 1894, vol. viii., pp. 8-9.

Pilsbry, H. A.—Notices of new Japanese Molluscs. II. *Ibid.*, pp. 9-10.

Pilsbry, H. A.—*Perostylus*, a new genus of Fusoid gastropod. *Ibid.*, pp. 17-18.

Probably only the apex of a *Fusus*.

Pilsbry, H. A.—Notices of new Japanese Molluscs. III. *Ibid.*, p. 16.

Pilsbry, H. A.—Notices of new Japanese Molluscs. IV. *Ibid.*, p. 29-31.

Pilsbry, H. A.—Note on *Liparus*. *Ibid.*, p. 35.

Pilsbry, H. A.—Notices of new Japanese Molluscs. *Ibid.*, pp. 47-8.

Clausilia stearnsii is a new species from Loochoo Is.

Pilsbry, H. A.—Critical list of Molluscs collected in the Potomac Valley. Proc. Acad. Nat. Sci., Philad., 1894, pp. 11-31, pl. 1.

The group of shells generally called *Zonites* by American authors is critically reviewed, and Mr. Pilsbry points out that *Zonites* is confined to European faunas. He divides the American *Zonites*—so called—into *Omphalina*, Raf. (1831), [contains *fuliginosa*, the reproductive organs of which are figured], *Vitrea*, Fitz., (1833) [contains *arborescens*, *electrina*, and *indentata*], and *Gastrodonta*, Alb. (1850) [contains *suppressa* and *ligeri*]. Two new varieties are described of *Polygyra tridentata*. There is also a preliminary description of *Philomycus*.

Pilsbry, H. A.—List of Port Jackson Chitons collected by Dr. J. C. Cox, with a revision of Australian *Acanthochitida*. *Ibid.*, pp. 69-89, pls. ii.-iv.

Haploplax is a new section for *Ischnochiton smaragdinus*, Ang. *Meturoplax* is a new sub-genus of *Acanthochites*, holding the same relation to it as *Pallochiton* does to *Chatopleura*. *Loricella* is raised from a section of *Lorica* to a genus. The following are new species:—*Acanthochites bednalli* and *Chiton coxi*. The paper will be invaluable to students of Australasian Chitons.

Quadrass, J. F. and Moellendorff, O. F. von.—Diag. spec. nov. ex insulis Philippinis. Nachr. Deutsch. Malak. Gescl., 1894, pp. 113-130.

Rolle, Hermann.—Diag. neuen orientalischen arten. *Ibid.*, pp. 136-8.

Four new *Helix* and a new *Zonites*, mostly from Cyprus.

Simroth, H.—Beiträge zur Kenntniss der Kaukasisch-aramerischen Nacktschnecken-fauna. Sitz. Gescl. d. wiss. Math.-Nat., Prag., 1893, pp. 8-23, T. xvii.

Limax primitivus is described as new. Its anatomy is described and figured, and at some length compared with other species.

Simroth, H.—Beiträge zur Kenntnis der portugiesischen und der ostafrikanischen Nacktschnecken-fauna. Abhandl. d. Senckeub. naturf. Gesell., 1894, Bd. xviii., pp. 289-308, T. i.-ii.

Dr. Simroth's Studies upon the Portuguese and African slug faunas rank perhaps amongst the finest publications on Molluscan anatomy. The paper before us is equal in every detail to its predecessors, being of exceptional interest to the malacologist, beautifully printed, and illustrated by two plates bearing the name of Werner and Winter.

The following new species are described and figured:—

Geomalacus grandis.—Omnibus speciebus notes Geomalaci generis major; griseus reticulatus, dorso maculis nigris notato. Solca alba.—Ductus receptaculi seminis longus, musculo genitali in medio inserto.—Habitat: Serra Estrella.

Arion hessei.—Arioni timido similis. Atrium genitale majus, ductus receptaculi seminis brevis. Habitat: Coimbra.

Agriolimax immaculatus, Simr., *nigrescens*, var. nov.

Urocyclus rufescens.—Juvenilis griseus, tæniis duabus dorsalibus albis notatus, tæniis pallialibus nigris. Adultus pallio rubro-notato, lineis radiatis dorsalibus rufis, tæniis dorsalibus aut albis aut absentibus. Habitat: Usambara, Darenia.

Phanerophorus unicolor.—Griseus, unicolor.

Smith, Edgar A.—On the Land-Shell of Western Australia. Proc. Malac. Soc. Lond., 1894, vol. i., pp. 84-99, pl. vii.

Smith, Edgar A.—On the Land-Shell of the Natuna Islands. Ann. Mag. N.H., 1894, vol. xiii., pp. 453-65, pl. xvi.

A collection of 31 species, 18 of which are undescribed. The fauna appears to be equally related to Borneo and the Malay Peninsula. The new species belong to the following genera: *Microcystis* (1), *Trachonanina* (2), *Trachomorpha* (1), *Sitala* (1), *Patula* (1), *Tornatellina* (1), *Leptopoma* (1), *Lagocheilus* (4), *Cyathopoma* (1), *Cyclotus* (2), *Pupina* (1), *Diplommatina* (2).

Suter, Henry.—Additions and Emendations to the Reference List of the L. & F. W. Moll. of New Zealand. Proc. Linn. Soc. N.S.W., vol. viii., pp. 484-502, pl. xxii.-xxiii.

This paper contains the descriptions of the new species named but not described in his paper (reviewed *ante* vol. ii, p. 179). They are, *Lagocheilus* (2), *Paryphanta* (1), *Allodiscus* (2), *Laoma* (1), *Ptychodon* (1), and *Charopa* (2).

On pp. 502-3, Mr. Charles Hedley appends some "Notes to the above."

Suter, Henry.—List synonymique et bibliographique d. Moll. ter et fluv. de la Nouvelle-Zéland. Journ. de Conchy., 1893, pp. 220-93, pl. ix.

This list, with its introduction by M. Crosse forms the most complete summary of the known New Zealand Fauna that has yet appeared. It follows in outline that of Messrs. Hedley and Suter (P. I. S., N. S. W.), but the references and localities have been more extended, and by a comparison of specimens with Pfeiffer's types in the British Museum, the identifications have been rendered more accurate. Mr. Suter reduces *Phacusa*, *Therasia*, *Carthaea*, *Pyrrha*, *Phenacohelix*, *Allodiscus*, &c., to subgenera of *Flammulina*, instead of leaving them as genera, and a similar course is wisely pursued with the sections of *Endodonta*. The new species in P. I. S., N. S. W., vol. viii., should surely be dated 1894 and not 1893. The present number of the *Journal de Conchy.*, although dated 1893, was issued in July 1894.

Suter, Henry.—Further Contrib. to the Knowledge of the Moll. Fauna of New Zealand, with descrs. of eight new species. Trans. N.Z. Inst., 1893, vol. xxvi., pp. 121-38, pls. xiv-xxi.

A most interesting contribution. We regret that want of space will only allow but a very brief review. The use of the name *Athoracophorus*, Gould, is upheld for the genus *Janelia*. *A. papillatus* is figured with drawings of the jaw and

radula; after carefully comparing the published accounts of the anatomy of *A. verrucosus*, Von Martens, with this species, Mr. Suter is of opinion that they are "one and the same species." The much abused *Neojanella dubia*, Ckll., "is nothing else but *A. bitentaculatus*," according to Mr. Suter.

The new species are *Gundlachia*, sp., *Lagochilus fasciatum*, *Flammulina pilsbryi*, *Pyrriha subincarnata*, *Allodiscus smithi*, *A. rusticus*, *Laoma ciliata*, *L'hrigsnathus murchisoni* and *P. cheesemani*, all of which are figured, as well as many other species.—W.E.C.

Suter, Henry.—Check-list of the New Zealand L. & F. Mollusca. *Ibid.*, pp. 139-54.

A very useful list enumerating 177 species.

PHYSIOLOGY, HABITS AND CONDITIONS OF LIFE.

C[unningham], J. T.—On specialised organs seen in action. Journ. Mar. Biol. Assoc., 1894, vol. iii., pp. 166-7.

Gain, W. A.—Growth of Shells of Helices. Sci. Goss., 1894, p. 140.

Layard, E. L. Mimicry in Mollusca. Journ. Conch., 1894, pp. 386-8.

Step, Edward.—The Egg-laying of *Helix pomatia*. Sci. Gos., 1894, p. 99.

Winkley, M. H.—Hatching of *H. pomatia*. *Ibid.*, p. 140.

SPECIAL FAUNA AND DISTRIBUTION.

A.A.—*Dreissensia polymorpha*, Pallas. Journ. Conch., 1894, p. 404.

Adams, L. E.—*Hydrobia (Paludetrina) jenkinsi* at Lewes. *Ibid.*, p. 390.

Barber, H. J.—Dispersal of Shells. Sci. Goss., 1894, p. 92.

Brazier, John.—Distribution of little-known Moll. fr. Polynesia and Australia, with their synonyms. Proc. Linn. Soc., N.S.W., vol. viii., pp. 430-5.

Carrington, John T.—Freshwater Snails in Trafalgar Sq. Sci. Goss., 1894, p. 92.

Cox, J. C.—Notes on the occurrence of a species of *Plecotrema* and other Mollusca in Port Jackson. Proc. Linn. Soc., N.S.W., vol. viii., pp. 422-9.

Crosse, H.—Note préliminaire sur la Faune malac. terr. et fluv. de la Nouvelle Zélande et sur les affinités. Journ. de Conchy. (1893), p. 209-19.

Dall, W. H.—Synopsis of the *Macridæ* of North America. Naut., 1894, vol. viii., pp. 25-28.

Dautzenberg, Ph.—Liste des Moll. terr. et fluv. rec. par M. Barrois en Palestine et en Syrie. Rev. Biol. du Nord de la France, 1894, vol. vi., pp. 329-53.

Dautzenberg, Ph.—Moll. marins de St. Jean-de-Luz. Mém. Soc. Zool. France, 1894, vol. vii., pp. 235-6.

Dumas, M. l' Abbé.—Les Moll. de l' Allier (suite). Rev. Sci. Bourbonnais, 1894, pp. 17-24.

Dupuy, Gaston.—Moll. de la Nouvelle Calédonie. Feuille Jean. Nat., 1894, pp. 137-9.

- Farrer, W. J.—The Moll. of the Lake District. Sci. Goss. 1894, pp. 92 and 116.
- Fischer, P. et Crosse H.—Mission Scientifique dans l'Amerique Centrale : Mollusques, 1894, T. ii., pp. 393-488, pl. 55-58.
- Grabham, O.—*Viviparus conlectus* near Askern. Nat. 1894, p. 174.
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- Ihering, H. von.—Die Susswasser Bivalven Japans. Abh. Senck. Nat. Ges., Bd. 18, pp. 145-66, pl.
- Klika, B.—Verzeichniss der von Dr. V. Vávra während seiner Kaukasus-Reise gesammelten Binnenconchylien, 1893, pp. 1-7.
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- Nobre, Augusto.—Contrib. para a malacologia portugueza. Ann. d. Sci. Nat. Porto, 1894, vol. i., pp. 135-6.
- Nobre, Augusto.—Sur la faune Malac. d. îles de S. Thomé et d. Madère. *Ibid.*, pp. 140-44.
- Nobre, Augusto.—Estudos sobre a fauna aquatica dos rios do norte de Portugal (Molluscos, pp. 154-7). *Ibid.*, pp. 151-7.
- Patterson, R. Lloyd.—The Common Mussel (*Mytilus edulis*) in Belfast Lough. Irish Nat., 1894, pp. 136-7.
- Pearce, S. Spencer and Mayfield, Arthur.—The L. and F. Moll. of E. Norfolk. Journ. Conch., 1894, pp. 391-404.
- Pilsbry, H. A.—List of Port Jackson Chitons and Revision of Australian *Acanthochitidae*. Proc. Ac. Nat. Sci. Phil. 1894.
- Pilsbry, H. A.—On the *Orthalius* of Florida. Naut., 1894, vol. viii., pp. 37-9.
- Pilsbry, H. A.—On *Chiton hartwegii*, Cptr., and its allies. *Ibid.*, pp. 45-7.
This species and *Trachydermon nuttallii* are identical. *T. raymondi* is described from San Francisco. Why call the species a *Chiton*?
- Preston, H. B.—Dispersal of Flora and Fauna (*H. aspersa*). Sci. Goss., 1894, vol. i., p. 137.
- Sampson, F. A.—Southern shells in Missouri. Naut., 1894, vol. viii., pp. 18-19.
- Simroth, H.—Nachtrage zu die Mollusken-fauna des Königreiches Sachsen. Nachr. Malac. Deutsch. Gesel., 1894, pp. 130-33.
- Smith, Edgar A.—Note on the Variation and Distr. of *Bulinus oblongus*, Müll. Proc. Malac. Soc. Lond., 1894, vol i., p. 137.
- Smith, Edgar A.—Note on the Genus *Balea*. Journ. Conch., 1894, p. 389.
- Stearns, R. E. C.—*Helix coloradoensis*: a new locality. Naut., 1894, vol. viii., p. 29.
- Stearns, R. E. C.—Distrib., &c., of *Triadopsis* and *Mesodon*. *Ibid.*, pp. 6-8.
- Stearns, R. E. C.—*Urosalpinx cinereus* in San Francisco Bay. *Ibid.*, pp. 13-14.
- Sykes, E. R.—On the South African *Polyplacophora*. Proc. Malac. Soc. Lond., 1894, vol. i., pp. 132-6.
- Webb, W. M.—*Testacella haliotideae*, Drap. Nature, July 26th, 1894, p. 296.
- Wetherby, A. G.—A few notes on *Helix appressa*. Naut., 1894, vol. vii., pp. 14-16.
- White, F. A.—*Melongenella corona*, Gmel. *Ibid.*, 1894, vol. viii., p. 11.

PALÆONTOLOGY.

Cossman, M.—Révision sommaire de la faune du Terrain Oligocène marin aux environs d'Étampes (suite). Journ. de Conchy., 1893, pp. 297-363, pl. x.

A new family *Diastomidae* is created for *Diastoma* and allied fossil genera. The following species are new:—*Euthria dollfusi*, *Scaphander mediocris*, *Sandbergeria trimargarita*.

Jahn, J. J.—*Duslia*, eine neue Chitonidengattung aus dem Böhmisches Untersilur. Setz. Akad. wiss. Wien, 1894, Bd. cii., pp. 591-603, pl.

A remarkable new species which has twelve valves; it seems, however, hardly necessary to have created a new genus for it, as *Triopus*, Barrande (from the same formation) seems nearly enough allied to have contained *Duslia insignis*.

Lehmann, F.—Die *Lamellibranchiata* des Miocens von Dingden, ii. Theil. *Siphonida sinuipallata*. Ver. Nat. Vereins. d. pr. Rheinlande, 1894, pp. 273-94, pl. v.

Monterosato, Marquis de.—Conchiglie terr. viv. e foss. de Monte Pellegrino. Nat. Siciliano, 1894, An. xiii., pp. 165-73.

Newton, R. B.—Note on some Molluscan remains lately discovered in the English Keuper. Journ. Conch., 1894, p. 408.

Newton, R. B., and Harris, G. W. F.—A Revision of the British Eocene Cephalopoda. Pro. Malac. Soc., Lond., 1894, vol. i., pp. 119-131, pl. x.

Tate, R.—Unrecorded genera of the older Tertiary Fauna of Australia, including diagnoses of some new genera and species. Proc. Roy. Soc., N.S.W., 1893, xxvii. (pub. Mar. 1894), pp. 167-96, plates x. to xii.

Herein Prof. Tate transfers to the Eocene various Australian beds formerly held to be Miocene, correlates the Oamaru series of New Zealand with the Australian Eocene, and associates both with the oldest European Eocene deposits. The bulk of this important paper is devoted to the mollusca, the following new genera of which are proposed:—*Ataxocerithium*, *Calytropis*, *Triploca*, *Poroleda*, and *Phragmorisma*. New species figured and described are:—*Spirulirostra curta*, *Concholepas antiquata*, *Distortio interposita*, *Harpa pachycheila*, *Dolium biornatum*, *Eburnopsis tessellatus*, *Genolia fontinalis*, *G. decomposita*, *G. pritchardi*, *G. angustifrons*, *Diastoma provisi*, *Semivertagus subcalvatus*, *S. capillatus*, *Ataxocerithium concatenatum*, *Colina apicilobata*, *C. fenestralis*, *Aclepyramis olivellaformis*, *Isapis cothinus*, *I. elatus*, *Litiopa punctulifera*, *Risella alta*, *Basilissa cosmarzi*, *Triploca ligata*, *Poroleda lanceolata*, *Pholadomya australica*, *Anatina dolabriformis*, *Phragmorisma anatinaformis*, *Myochama plana*, *M. rugata*, and *Cranidia quadrangularis*. We note that the genus *Poroleda* has already appeared on p. 86 of the Macleay Memorial volume.—C. H.

BIOGRAPHICAL.

Ashford, Charles.—Journ. Conch., 1894, pp. 405 7, and portrait.

EDITOR'S NOTES.

We regret to hear of the death of Prof. Michele Lessona, of Turin, on July 20th, in his 71st year.

THE
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THE JOURNAL OF MALACOLOGY.

AFTER the present number the control of this paper will pass into the hands of Mr. W. M. Webb, F.L.S., and though Mr. Collinge will continue as co-editor, a page of the history of the "Journal of Malacology" has been turned, and a brief account of its career may be of interest to the subscribers. It is perhaps most fitting that I should be the person to write it, as I was the first Assistant Editor, and therefore, probably, am more acquainted with the working of the journal than my colleagues are.

The first number of this journal appeared in March 25th, 1891, under the title of "The Conchologist," under which name it continued until the close of 1893, and consisted of 16 pp. of letterpress, the shape being crown 4to. Mr. Collinge bore the whole burden of the editing until the close of that year, when the shape of the journal was altered to its present form, and the "Assistant Editors" commenced to join the staff. The dates of these additions are as follow: the Rev. A. H. Cooke, M.A., Dr. R. F. Scharff, and myself prior to March, 1892; Mr. W. Garstang, M.A., June, 1892; Mr. B. B. Woodward, F.G.S., June, 1893; Mr. Charles Hedley, F.L.S., September, 1893; and Lieut.-Col. H. H. Godwin-Austen, F.R.S., March, 1894. The services of Mr. Garstang and Dr. Scharff were lost at the close of 1893.

Owing to a generous desire on the part of Mr. Collinge not to clash with the newly-formed Malacological Society, an endeavour was made to confine the papers to those dealing with "the slugs and slug-like genera," and the title was accordingly altered to "The Journal of Malacology"; this endeavour has in a great measure been carried out.

Since the foundation of the paper over forty persons—in addition to the staff—have contributed papers to its columns, thus showing that it met an existing want.

These papers have dealt with the Mollusca, both recent and fossil; land, freshwater and marine; and the anatomy has received special attention. One great feature of the paper has been the exhaustive bibliography which, owing to the kindness of authors, has been carried out. It has dealt with considerably over a thousand books and papers in seven or eight languages: longer notices have by preference been given to those published out of Great Britain. The important 'Check-List of the Slugs' will cause the recollection of the journal as a land-mark in the study of those genera.

The lack of a paper which should be free and not the mere organ of a society has been long felt in England; papers on mollusca have been scattered among many journals, and the lack of some organ where they could be collected together, has been a hindrance to workers, who were unable, either owing to expense or other causes, to discover where the papers were and to procure them when traced. We therefore owe a great debt to Mr. Collinge for his pluck and liberality in founding this journal and carrying it on amongst the many troubles and difficulties which must have surrounded such an undertaking.

E. R. SYKES, B.A., F.Z.S.

WALTER EDWARD COLLINGE.

By ROBERT MACDONALD, M.A., B.Sc.,

Madras College, St. Andrews, N.B.

MR. WALTER E. COLLINGE, F.Z.S., whose portrait appears in this issue, will cease with this number of the "Journal of Malacology" to be its proprietor and editor. Mr. W. M. Webb, F.L.S., will succeed to the active control of the magazine, while Mr. Collinge will be retained as co-editor.

Mr. Collinge has been connected with this journal since its commencement as the "Conchologist" in 1890. Engaged at the time in the study of the mollusca, he was led by circumstances to establish a quarterly journal in which he could record his own observations, and those of others, and so present in compact form to his co-workers the most recent research work of all students of

malacology. At first unassisted, and in spite of rivalry, opposition, active misrepresentation, and pecuniary loss, the young editor fought his way into general favour. And now I can imagine him looking back on those cloudy days with complacency, as he hands over to his colleague the active superintendence of what is now the leading English Journal and Review of its specific subject.

Mr. Collinge is a born pioneer. Students of malacology were accustomed in 1890 to inefficient and slighting service; and were slow to believe that they need not submit themselves any longer to such. The success of a manual devoted entirely to conchology seemed very doubtful, but against prophecy, reasoning and prejudice, the "Conchologist" was produced, and brought out regularly—each number more useful and more valuable than the preceding. The success of the paper was due primarily to the need for it among workers in this field of science, but it was also largely due to the unbounded enthusiasm and capacity for work on the part of its editor. He might be said to have created the need for the journal by publishing it; previously a notice in an odd corner of a magazine of general science, or a long delayed and uncertain publication elsewhere, satisfied the student of Conchology; but the publication of the "Conchologist" drew together and crystallised the work of all, and many a new student of Zoology was encouraged by it to give more than a mere passing notice to the Mollusca.

Mr. Collinge was educated at the Yorkshire College, Leeds (Victoria University). On the completion of his course he was elected Assistant in Biology there under Professor L. C. Miall, F.R.S., and it was during this period that the "Conchologist" was first produced. In 1891 he became Demonstrator of Zoology in St. Andrews University, under Professor W. C. M'Intosh, M.D., LL.D., F.R.S., where he gained the Woodall Fisheries Prize, and turned his attention to the study of Teleostean Fishes. In the Marine Laboratory of St. Andrews—where material is never wanting—in the midst of his routine work of classifying and enumerating large quantities of pelagic ova, he found time for experiments on them in preparation for the microscope, and perfected a method for preserving them. His articles on the Mollusca in Chambers' Encyclopedia were written by him also at this time; and the "Conchologist" of this year (1892) contains amongst other articles from his pen a work entailing careful and methodical criticism, viz., "A Review of the British *Arionidae*." In 1892 he was elected Demonstrator of Biology in Mason College, Birmingham, and here under Professor T. W. Bridge, M.A., he has been enabled to pursue the study of Fishes begun in St. Andrews.

His researches on the "Relations of the Cranial Nerves to the Sensory Canal System" are published in the "Proceedings of the Birmingham Philosophical Society," the British Association Report for 1893, and are still appearing in the "Quarterly Journal of Microscopical Science."

Mr. Collinge is thus not a faddist in Conchology—but a sound scientific student of Anatomy, who has long been specially interested in this branch of it. Doubtless anyone's interest in "Snails" begins with his pleasure in contemplating the spiral covering, but it is mere dilettanteism and not science to end as a collector of shells for one's cabinet. In the "Conchologist" Mr. Collinge has always acted liberally in publishing freely the views of enthusiastic collectors, but his personal contributions to the subject are mainly anatomical, and it is on the anatomy mainly that he relies for identification of species, or for establishment of relationship.

I understand that Mr. Collinge has in MS. the first of a series of studies in Vertebrate Morphology. Text-books on types become after a time somewhat *polarized*; and if for no other reason new books on new selected types should be made welcome. But, although somewhat unkind to prejudice unseen work, we may expect from Mr. Collinge something better than mere text-books on typical animals, which may replace our present dog's-eared copies.

A LIST OF THE RECENT SPECIES OF THE GENUS *PIRULA*, LAMARCK, WITH NOTES RESPECTING THE SYNONYMY.

BY EDGAR A. SMITH, F.Z.S.,

Zoological Department, British Museum, London.

THE recent species of the genus *Pirula*, of which the *Bulla ficus* of Linné is the type, have been monographed or catalogued by Lamarck,* Deshayes,** Reeve,† the late G. B. Sowerby,†† Rousseau,‡ Kobelt,‡‡ and Tryon,‡‡‡ and reviews of the genus have been given by Petit,¹ Fischer,² and the present Mr. G. B. Sowerby.³ In describing

* Hist. Nat. Anim. Sans. Vert., 1822, vol. vii., p. 137. ** Op. cit., ed. 2, vol. ix., p. 502.

† Conch. Icon., vol. iv. †† Thesaurus Conch., vol. iv., p. 109. ‡ Chenu's Illustr. Conchyl., vol. iii. ‡‡ Conchyl. Cab., ed. 2. ‡‡‡ Man. Conch., vol. vii., p. 265.

¹ Journ. de Conch., vol. iii., p. 140. ² Op. cit., 1884, p. 5. ³ The Conchologist vol. ii., p. 73.

a new species recently received from the Bay of Bengal, I took the opportunity of examining the species contained in the collection of the British Museum and also the literature in connection with the genus.

As there appears to be considerable difference of opinion among the authors mentioned with regard to the value of Lamarck's *P. decussata*, and also a divergence of opinion respecting the synonymy of some of the other species, I was induced to study the subject somewhat carefully and so put together the following notes:—

1. *Pirula ficus* (Linn.)

Bulla ficus, Linn. Syst. nat., ed. 12, p. 1184, partim. *Sycotypus ficus*, H. & A. Adams, Gen. Moll., vol. iii., pl. xxi., fig. 1 (animal). *Ficula levigata*, Reeve, Con. Icon., fig. 4; Voy. Samarang, p. 39, pl. ix., fig. 4 (animal).

Hab.: Indian Ocean and Moluccas (Lam.); Ceylon, Aden (Brit. Mus.); Sooloo Sea, 35 fms. (A. Adams).

The identification of this species has been agreed upon by all the monographers; but Reeve, who employed the generic name *Ficula*, suggested by Swainson in 1835 for the species of this genus, in order "to avoid tautology" proposed another name, *Ficula levigata*, for this species. In the present day, however, we adopt the generic term *Pirula*, and therefore are at liberty to use the specific term *ficus* without being tautological. The genus "*Pyrula*" of Lamarck included species belonging to several genera as now understood, but it was restricted to its present limitations by Montfort in 1810, by Schumacher in 1817, and again in 1824, by Sowerby, a fact apparently unknown to Swainson or Reeve. Moreover the *only* species quoted by Lamarck, when he originally described the genus, and therefore the type (Mem. Soc. Nat. Hist., Paris 1799, p. 73) was the *Bulla ficus* of Linn.

In the twenty-fourth number of his "Genera of Recent and Fossil Shells," published in 1824, Sowerby figured three species of "*Pyrula*," and in the account of the genus observed: "The shells which, alone, in our opinion, ought to form the genus *Pyrula*, are oblong, rather thin, and generally, more or less strongly cancellated on the outside; they have a thin epidermis which is scarcely ever sufficiently adhesive to remain on the shells when brought into commerce." He gives a further careful description of the genus, leaving not the slightest doubt as to its scope and consequently the revival of Swainson's name by Reeve, Kobelt, and the late G. B. Sowerby was altogether unnecessary. For various reasons the generic

terms *Ficus*, Klein 1753, *Ficus*, Rousseau 1846, *Sycotypus*, H. and A. Adams 1853 (non *Sycotypus*, Browne 1756) and *Otus*, Risso 1826 must also be rejected. They are either prelinnean, preoccupied, or proposed after the genus "*Pyrula*" was definitely limited.

2. *Pirula papyracea*, Say.

Pyrula papyratia, Say. J. Acad. Nat. Sci., Philad., vol. ii., p. 238 (June 1822).

Pyrula papyratia, Tryon. Man. Conch., vol. vii., p. 266, pl. vi., f. 35.

Pyrula papyracea, Sowerby. Conchologist, vol. ii., p. 74.

Pyrula reticulata, Lamarck. Hist. Anim. sans Vert., vol. vii., p. 141 (August 1822).

Pyrula reticulata, Deshayes. Ency. Meth. vers., vol. iii., p. 808, pl. 432, f. 2.

Pyrula reticulata, Sowerby. Genera, pl. 221, fig. 1.

Pyrula reticulata, Kiener. Icon. Coq. Viv., p. 28, pl. xii., f. 1.

Pyrula reticulata (partim), Kobelt. Conch. Cab., ed. 2, p. 7, pl. 1, figs. 4, 5; Illus. Conchylienbuch, pl. xxvi., f. 16.

Ficus ventricosa (partim), Rousseau in Chenu's Ill. Conch., pl. ii., f. 2. Jun. = *Ficus clathrata*, Rousseau. Op. cit., pl. ii., figs. 3-31.

Ficula gracilis, Philippi. Zeitsch. f. Malak., 1848, p. 97.

Ficula gracilis, Kobelt. Conch. Cab., p. 12, pl. 2, figs. 1, 2.

Pyrula fortior, Mörch. Mal. Blät., 1877, p. 43.

Hab.: Gulf of Mexico, Florida, Campeche (Philippi); Georgia and E. Florida (Say); British Honduras (Brit. Mus.).

What is the *Pyrula reticulata* of Lamarck? That author, Deshayes and Kiener consider it distinct from the *P. ficoides*. On the contrary, Reeve, Kobelt, Tryon, and G. B. Sowerby (1892) have united them or considered them as varieties of one and the same species.

After a careful consideration of the original diagnosis, and the description given by Deshayes and Kiener from Lamarck's type, also the figures in the Encyclopédie Méthodique and in Kiener's work, I am of opinion that not only is *P. reticulata* distinct from *P. ficoides*, but that it is the same form as that previously named *P. papyratia* by Say, and afterwards *P. gracilis* by Philippi.

The size, four inches, considerably exceeds that of average specimens of *P. ficoides*, although that species at times does attain that length, and the colouration is quite different. *P. reticulata* is a pale whitish shell, with very feeble light-brown spotting upon the principal transverse ridges, and the aperture is brownish far within, becoming whitish towards the outer lip. On the contrary, *P. ficoides* is a species exhibiting a considerable amount of variegation in colour.

Five or six transverse pale zones, spotted and blotched with brown or purplish-brown, are more or less distinct in most specimens. In addition to these differences, there is one which, if I am correct in the identification of Lamarck's *P. reticulata* with Say's *P. papyratia*, at once distinguishes it from *P. ficoides*. It is the superior size of the nuclear whorls. This is pointed out both by Philippi and Kobelt in their descriptions of *P. gracilis*.

The locality, Indian Ocean, quoted by Lamarck and repeated by subsequent authors, I regard as a mistake. It is worthy of notice that neither Lamarck, Deshayes, or Kiener have mentioned any other species from the Gulf of Mexico and Florida, or from any other locality in that region. The *P. papyratia* is not an uncommon species, and was described by Say in the same year, but a month or two before the publication of *P. reticulata*.

3. *Pirula ficoides*, Lamarck.

Pyrula ficoides, Lamarck. Hist. Anim. sans Vert., vol. vii., p. 142 (1822).

Pyrula ficoides, Kiener. Icon. Coq. Viv., p. 29, pl. xiii., f. 2.

Ficula reticula, Reeve (non Lamarck). Con. Icon., fig. 1.

Ficula decussata, Sowerby (non Wood). Thes. Conch., vol. iv., pl. 423, figs. 1-3.

Ficula reticulata, var. Kobelt. Conch. Cab., ed. 2, p. 7, pl. xix., figs. 5, 6.

Ficula reticulata, Adams & Reeve. Voy. Samarang, p. 39, pl. ix., fig. 5 (animal).

Pyrula reticulata (partim), Tryon. Man. Conch., vol. vii., pl. v., f. 28.

Ficus ficoides, Chenu. Man. Conch., vol. i., p. 211, f. 1150.

Sycotypus ficoides, Troschel. Gebiss der Schnecken, vol. i., p. 238, pl. xx., fig. 12.

Hab.: China Sea, W. Borneo, Japan, Red Sea, Mauritius, Madagascar, E. Africa, Ceylon, &c.

"A small prettily coloured variety" from the Mauritius, mentioned by Mr. G. B. Sowerby,* is also remarkable for the coarse cancellation of the surface.

4. *Pirula gracilis*, Sowerby.

Pyrula gracilis, Sowerby. Tankerville Cat. Appendix, p. xvii. (1825).

Pyrula elongata, Gray. Zool. Beechey's Voy., p. 115 (1839).

Pyrula Dussumieri (Valenciennes MSS.), Kiener. Icon. Coq. Viv., p. 25, pl. xi.

* Conchologist, vol. ii., p. 74.

Pyrula Dussumieri, Tryon. Man. Conch., vol. vii., p. 266, pl. v., f. 30.

Ficula Dussumieri, Reeve. Conch. Icon., f. 2.

Ficula Dussumieri, Sowerby. Thes. Conch., vol. iv., p. 110, pl. 423, f. 5.

Ficula Dussumieri, Kobelt. Conch. Cab., ed. 2, p. 10, pl. i., f. 1.

Ficus Dussumieri, Rousseau in Chenu's Ill. Conch., pl. i., fig. 2a (animal).

Hab.: China Sea (Kiener, &c.); Bay of Bengal in 65 fms. ("Investigator" Coll. in India Mus.).

P. testa elongato ficiformi, tenui, albidâ, brunneonebulosâ, striis, longitudinalibus exilissimis, transversis eminentioribus, planulatis; aperturâ intus brunneâ, labio externo albidio; long. 4 $\frac{1}{10}$ unc. lat. 2 $\frac{3}{10}$ unc.

Obs. A shell of more slender proportions than the other *Figs.*, and apparently very distinguishable by the characters given above. There are several specimens in this collection, but the locality has not been preserved with any of them."

Such is the description given by Sowerby of his *P. gracilis*, and it seems to me that it can only apply to the species commonly known as *P. Dussumieri*. It is catalogued by M. Petit (J. de Conch., 1852, p. 149) as a distinct species with the locality "Golfe du Mexique." The only species at present known from that locality is *P. papyracea*, and Sowerby's description does not suit that shell. The term "brunneo-nebulosa" and the flattened ridges are characteristic of *Dussumieri* and not of *papyracea*, the only form with which it could possibly be confounded.

The *P. elongata* of Gray described a year previous to the publication of *P. Dussumieri*, is evidently the same species, for the description in Beechey's Voyage, although brief, is applicable to that form only.

5. *Pirula ventricosa*, Sowerby.

Pirula ventricosa, Sowerby. Tankerville Cat. Appendix, p. xvi. (1825).

Bulla decussata, Wood. Index test. supp., p. 9, pl. iii., f. 3 (1828).

Pyrula ventricosa, Kiener. Icon. Coq. Viv., p. 27, pl. xii., f. 2.

Ficula decussata, Reeve. Con. Icon., f. 3.

Ficula decussata, Kobelt. Con. Cab., ed. 2, p. 10, pl. xxiv., f. 3.

Ficula reticulata, Sowerby. Thes. Con., vol. iv., p. 110, pl. 423, f. 6, 7.

Pyrula decussata, Tryon. Man. Conch., vol. vii., p. 266, pl. vi., f. 34.

Ficus decussatus, Chenu. Man. Conch., vol. i., p. 211, f. 1151.

Hab.: Gulf of California, Panama, and other localities on the west coast of Central America.

With the exception of Kiener all the monographers have designated this species by the name *decussata*, proposed by Wood in 1828. Three years previously, however, Sowerby had described it as *P. ventricosa*, which name on account of priority should be employed.

6. *Pirula filosa*, Sowerby.

Pirula filosa, Sowerby. Conchologist, vol. ii., p. 74.

Hab.: Hong Kong.

"This species may readily be recognised by its numerous and regular transverse brown lines," and "its cancellating ridges are more prominent, regular, and distant" than in other recent species.

7. *Pirula pellucida* (Deshayes).

Ficus pellucidus, Deshayes. Journ. de Conch., 1856, p. 184, pl. vi., figs. 1, 2.

Hab. ?

This species has been regarded by Kobelt and Tryon as a variety of *P. ficus*. The marked difference of colour and form, besides the opinion of such a master in conchology as Deshayes, seem to me to indicate or almost prove the distinctness of the species.

8. *Pirula tessellata* (Kobelt).

Ficula tessellata, Kobelt. Conch. Cab., ed. 2, p. 12, pl. ii., f. 3.

Pirula tessellata, Tryon. Man. Conch., vol. vii., p. 267, pl. v., f. 31 (after Kobelt).

Ficula reticulata (partim), Sowerby. Thes. Conch., vol. iv., pl. 423, f. 2.

Hab.: Australia (Kobelt); Rosemary Is. [Dampier Archipelago], Australia (Tryon); Swan River (Mus. Cuming).

Neither of the three specimens of this species in the British Museum have the two pale brownish bands described by Kobelt. They are quite white excepting the transverse series of subquadrate brownish spots.

9. *Pirula investigatoris*, Smith.

Sycotypus sp., Wood-Mason and Alcock, Ann. Mag. Nat. Hist., 1891, vol. vii., p. 15, cut 2.

Sycotypus investigatoris iid. MSS.

Pirula investigatoris, Smith. Ann. Mag. Nat. Hist., 1894, vol. xiv., p. 367.

Hab.: Off Ganjam coast, east coast of India, in 98-102 fathoms, on a sandy bottom.

A species of thin texture, more ventricose and with a higher spire than any of the other recent forms. It is as smooth and finely sculptured as *P. ficus*.

ON THE GENERATIVE ANATOMY OF AMALIA MARGINATA, DRAP., AND SOME REMARKS UPON THE GENUS.

By WALTER E. COLLINGE,

*Demonstrator of Zoology and Comparative Anatomy,
Mason College, Birmingham.*

I AM indebted to the kindness of Lieut.-Colonel G. S. Parry for a series of examples of *Amalia* collected by him in Tenerife. They are all in beautiful condition. I am therefore able to give an account of the animal and the anatomy of its generative system in some detail. The *Amalia* which has generally been accredited to Tenerife is the *Limax (Amalia) carinata*, d' Orb., who in 1839 described and figured this species.¹ As has been pointed out by Cockerell,² the figures "suggest at first sight some *Parmacella*."

The name *carinata* being preoccupied, Bourguignat³ re-named the species from d' Orbigny's figures, terming it *Limax polyptychus*—an eminently scientific and simple method of species making, and thoroughly characteristic of the Bourguignat school!

Mabille in 1868 proposed the new genus *Lullemantia*, in which he classed it. Later malacologists, content with external appearances, only removed the species to the genus *Amalia*, classing it as a variety or synonym of *gagates*.

D' Orbigny states that it is rare and inhabits the mountains near Santa Cruz. I think there can be no doubt but that the slug of d'Orbigny figured, and upon whose figures Bourguignat exercised his ingenious imagination, is the one which Lieut.-Colonel G. S. Parry has recently collected, and which I am here describing.

***Amalia marginata*, Drap.**

Animal (in alcohol). The whole of the dorsal region of the body is a bluish sepia, shading to an ochreous colour on the sides, which are minutely peppered with fine sepia and grey points. Head and tentacles lighter. The body is more attenuated than *gagates* and the mantle is oval with a circular cap-like protuberance in the

¹ Moll. Canar., 1839, p. 47, pl. iii., figs. 4 to 8.

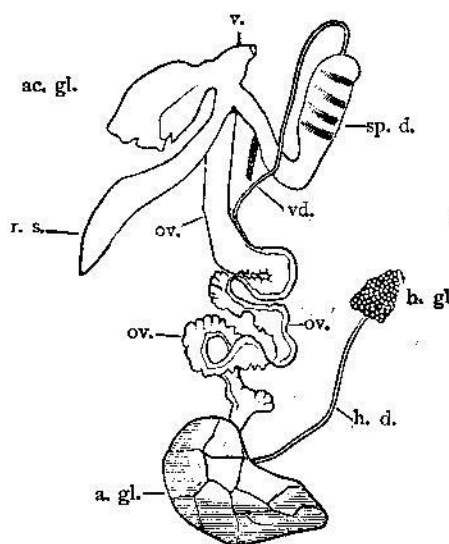
² Ann. Mag. N. H., 1891, p. 335.

³ Aménités Malacologiques, T. ii., p. 148.

posterior portion, the anterior lobe so typical of *gagates* is almost wanting. The posterior portion of the mantle is faintly marked with dark lateral bands. Keel straight and prominent. Foot-fringe yellowish-brown, with darker lineoles, foot-sole yellowish-brown with median plane distinct.

Length in alcohol 35 millim.

Habitat.—Santa Cruz and Orotava, Tenerife. "Fairly abundant under stones." (Lt.-Col. G. S. Parry).



Generative system of *Amalia marginata*, Drap.

ac. gl.—Accessory gland.	pr.—Prostate.
alb. gl.—Albumen gland.	r.—Retractor muscle.
h. d.—Hermaphrodite duct.	r. s.—Receptaculum seminis.
h. gl.—Hermaphrodite gland.	sp. d.—Sperm duct.
ov.—Oviduct.	v.—Vestibule.
ov'.—Free oviduct.	v. d.—Vas deferens.

Anatomy of Generative System.

There is a single vestibule to the side of which a large accessory gland is connected. This organ is bilobed, the inner lobe being the smaller of the two. In the example figured by Simroth* (T. x., fig. 1, xiii. B.) the two lobes are distinct from one another. These

* Zeit. f. Wiss. Zool., 1885, Bd. xlii., pp. 203-366.

accessory glands are very variable in all species of *Amalia*. Scharff⁵ records an example of *A. gagates*, Drap., in which there were as many as four glands. From the ventral surface of the vestibule the free oviduct passes off as a wide tube. Dorsally the receptaculum seminis and sperm-duct pass off. The receptaculum seminis is exceedingly large, it gradually enlarges in size from its commencement, and terminates in a blunt point. The sperm duct in all the specimens I have examined differs from that figured by Simroth. It is V-shaped as in *gagates*, but the outer arm is the larger, a series of faintly-coloured rings encircle this, which is expanded in a globose manner. The figure given in Lessona and Pollonera's Monograph⁶ (T. ii. f. 14) is poor and not at all characteristic of the species, which might be said of most of the drawings of the generative organs of the species of *Amalia* there figured. A short vas deferens passes from the apex of the sperm duct and traverses the side of the free oviduct, opening into the prostate. The common duct is richly convoluted, the oviducal and prostatic portions being very distinct. There is a large albumen gland. The hermaphrodite gland is somewhat small and very constant in all the specimens examined, consisting of a series of small glands forming a somewhat triangular mass. The hermaphrodite duct is a fine tube, but little convoluted.

Respecting the classification of the species of *Amalia*, I would place the following as well marked and distinct species, both externally and internally they are easily distinguished from one another.

1. *Amalia gagates*, Drap.
2. *Amalia marginata*, Drap.
3. *Amalia sowerbii*, Fer.
4. *Amalia gracilis*, Leyd.
5. *Amalia robici*, Simr.
6. *Amalia cretica*, Simr.
7. *Amalia cristata*, Kal.

I do not say that these are all the distinct species of the genus, but only those which at present I am able to express an opinion upon. If the external and internal character of these species were better known we should have far fewer so-called new species. Many of the *gagates* group will, as soon as their anatomy is investigated, be found to be simply varieties of that species. I refer to such forms as *plumbea*, Moq., *mediterranea*, Ckll., *maura*, Q. & G., *tasmanica* and *nigricolus*, Tate.

⁵ Trans. Roy. Dublin Soc., 1891, vol. iv., pp. 513-562, 2 pls.

⁶ Monog. d. Limacidi Italiani, 1882, pp. 1-82, T. I.-III.

The species of the *Subamalia* section of *Pollonera* are well worthy of a much more careful anatomical study than they have yet received. Such forms as *A. cretica* and *A. robici*, Simr., will probably throw much light upon the structure and affinities of the genus which is at present very desirable.

Out of seventy adult examples of *A. sowerbii* which I dissected the amount of variation was exceedingly small, and by no means so well marked as the differences found in young specimens. In *A. gagates* even slight variations were not at all common, although one or two occurred in the form and number of the accessory glands and the constrictions in the sperm-duct, neither points of great importance. The constancy in this genus of the generative organs certainly makes these a very safe character for basing specific distinctions on, and as soon as the minor differences are figured and described—if they exist—in the many doubtful forms, the sooner will the limits, &c., of the genus be better understood.

NOTES.

Mollusca as Purifiers of Water.

A use, novel to me, of pond snails by the Chinese silk growers is described in an official work which caught my eye by chance. This waif of malacological information is so certain to escape recorders that I transcribe the passage for the *Journal of Malacology*.

Report on Silk. Imperial Maritime Customs of China, ii., Special Series, No. 3; Shanghai, 1881, p. 57.

"The water used for reeling silk is taken from mountain streams, as being the cleanest; the water from wells is never used; and if mountain water cannot be had, river water is taken, which is cleaned by putting a pint of live shellfish to one jar of water. There is a special kind of shellfish, called the pure water shellfish [here follows the vernacular name in Chinese characters] (fig. xxiv.), found everywhere in ponds, wells, and creeks. They first of all sink to the bottom of the jar, and then by degrees make their way up its sides, consuming gradually all impurities in the water within half a day or so. After the clean water has been drawn from the jar, the shellfish are cleansed and put to the same duty again."

As the three coloured figures are drawn in Chinese perspective the species cannot be certainly identified. They are, however, sufficiently like Reeve's figure (*Conch. Icon.*, vol. xiv., *Paludina*, pl. iv., f. 18) of *Vivipara chinensis*, Gray, to assume that this the artist endeavoured to portray.—CHARLES HEDLEY, F.L.S., Australian Museum, Sydney.

Note on the Value of *Laimodonta*.

I regret to suggest the alteration of a generic name, but I think for the reasons appearing below that *Laimodonta* can hardly stand, and therefore propose:

Enterodonta, nom. nov.

- 1855 (Jan.). *Laimodonta*, H. and A. Adams, P.Z.S., 1854, p. 34.
Non. 1841. *Laimodon*, G. R. Gray, *Genera of Birds*, ed. 2, p. 49.
Non. 1846. *Læmodonta*, Philippi, *Zeitschr. für Mal.*, p. 98.
Non. 1847. *Laimodonta*, Bronn, *Preisver. Ausl. Konch. Mus. Heidelberg*,
 iv., p. 4.
Non. ? *Laimodonta*, Nuttall, MS.

Gray's name was only a new name for an already preoccupied genus of the *Picidae*, and so would stand on its bare publication; it was, however, fully described in his subsequent larger work, which also antedates Messrs. Adams. The paper by these authors appeared in the P.Z.S. eight months prior to the part of their "Genera of Recent Mollusca," which contained the name. Bronn's *Lammodonta* was never described, and the name only appeared in a sale catalogue, the type is probably *Plecotrema striatum*, Phil. (sp.). Philippi used, and misspelt, the name in consequence of shells that he received from Bronn; he did not describe it. I cannot find that Nuttall ever published the name, though most authors seem to have given him credit for it.—E. R. SYKES, B.A., F.Z.S., London.

Reviews of the "Manual of Conchology."

In looking over the reviews of the Manual of Conchology in the "Journal of Malacology," I have been forcibly struck by the widely different conceptions of the functions of a reviewer held by "E. R. S." and myself. I have believed that such notices as these should primarily give an idea of the new or original views advanced in the publications noticed, and the more faithfully these are mirrored, the better the review; typographical errors and misprints being (secondarily) indicated. "E. R. S." seems to act on the theory that original views (except in so far as these are expressed in *new names*—a very different thing from *new ideas*) are not worth space, which is given up largely to the correction of supposed "slips" and "printers' errors." Even these would be of use were they well founded, but to attempt corrections without being familiar with the subjects treated is dangerous, and should not lightly be essayed. "Don't monkey with the buzz saw," as the sign reads in a Western saw-mill. In the March Journal, "E. R. S." says "*Hedleyconcha*, a horrible name"; but was the name as I wrote it as bad as this incorrect spelling? And then "E. R. S." adds a syllable to *Thaumatodon*, making it *Thauminatodon*, a name I never proposed, and a stumbling-block to future nomenclators. Again, in the June issue he says that the key to *Sagda* would "be of more use if *S. jayana* and *S. laminiifera* did not appear in more than one section of it," which is not true, as provision had to be made for the wide variation of certain species; and, moreover, "*S. laminiifera*" is E. R. S.'s name, not mine. I wrote *lamellifera*. I never heard of "*S. laminiifera*" before. Can it be a "slip" of my worthy critic, like "*Hedleyconcha*," "*Thauminatodon*," &c.? In the September Journal, "E. R. S." says: "Slips such as 'Fischer' for 'Fischer de Waldheim,' and printers' errors such as 'Acteon' are too numerous." The first of these was no "slip," but an intentional contraction supposed to be allowable in view of the fact that the full name appears in the generic caption on the same page. As to "*Acteon*," if "E. R. S." had looked up the reference in which I use this spelling, he would see that I quote it faithfully. And so I could go on, showing many more errors on the part of "E. R. S." but *cui bono*? As long as human nature remains what it is, critics will shoot their little arrows; and if this target of mine affords them amusement, surely I should not complain, but rather be grateful if sometimes a true shot nails error in view of the scientific field.—H. A. PILSBRY, Academy of Natural Sciences, Philadelphia.

It is a popular superstition with authors that critics who do not agree with them are incompetent, and Mr. Pilsbry is no exception to the general rule. He complains that I do not refer to his "new or original views"; if, however, I consider that there are none in a particular work, I cannot mention them. As to what constitutes "original views," each critic must form his own opinion. A review such as he seems to desire would take up more space than can be spared. Mr. Pilsbry must remember that, saying that I am not familiar with subject, does not prove that he is. "No case, abuse your adversary," is a good old saying. Seriously, however, I have much admiration for the good work Mr. Pilsbry has done and is doing. The point of my remark as to *Hedleyconcha* is that a modern surname combined with a Greek word is not a good generic name. The key to *Sagda* is, in my opinion, founded on an insecure basis; the two species do undoubtedly occur in more than one section of it, namely in (a a) and (a a a), and, if Mr. Pilsbry cannot fit the species in without this occurring, he can hardly expect me to praise it. That is the point of the criticism to which

he should address himself. The deliberate use of "Fischer" for "Fischer de Waldheim" cannot be right, as it would lead readers to believe that Dr. Paul Fischer was intended; the contraction could serve no useful purpose, as there is plenty of room at the close of the paragraph in which it occurs. The name of "Fischer" occurring after the family name on the page before would increase the confusion. If it were allowable to contract the name, then the full name should be printed before the contraction and not after. If readers will refer to the use of "*Acteon*" (ser. I. part 59, p. 153), they will see that it is not referred to as a quotation, as Mr. Pilsbry states in error; the full sentence is, "This species is the type of the genera *Acteon*, *Tornatella*, and *Speo*." Really Mr. Pilsbry should not expect me to be better acquainted with his works than he is himself. I shall not carry on this controversy further, for, as he wisely remarks, *Cui bono*? It is a pity that this did not occur to him earlier.—E. R. S.

CURRENT LITERATURE.

In order to make the following Bibliography as complete as possible, the Editor invites the co-operation of British and foreign authors. All communications should be addressed to the Editor, the "Journal of Malacology," Mason College, Birmingham, England.

MALACOLOGY IN GENERAL.

Taylor, John W.—A Monograph of the L. and F. M. of the British Isles. Part I., pp. 1-64. 1 pl., 138 figs.; Leeds: Taylor Bros., Oct. 1894.

A work on the L. and F. Mollusca of the British Isles, which would incorporate the latest views of all schools of workers, has long been wanted, and that the present publication, when complete, will form a valuable addition to the literature of the subject, there can be little doubt.

Part I deals with the History, Classification, Nomenclature, Synonymy, and Shell.

The views of most authors are set forth in a fair and concise manner, a feature which we trust will continue to characterise the work. Even should there be much in the systematic portion to which we shall be unable to assent, or however adversely we regard the same, we feel the amount of time and energy that has been expended, the care and patience with which material has been collected, and the manner in which the same is now arranged, well merit the support of all who are interested in this section of the mollusca. Mr. Taylor is to be congratulated upon the style of production and illustration, which leave nothing to be desired.

We trust we shall not have to wait long for future parts, but that the support given to the present issue will stimulate the author to a speedy publication.

W. E. C.

STRUCTURE AND DEVELOPMENT.

Babor, J. F.—Über den Cychus der Geschlechtentwicklung der Stylommato-phoren. Verhandl. d. Deutsch. Zool. Gesell., 1894, pp. 55-61, figs. 1-10.

This interesting paper details some very valuable observations upon the variation of the generative organs of certain molluscs. A large number of cases are reported where either the male or female organs were absent, e.g., those of Biérix (*H. pomatia*), Giard (*Pterotrachea*), Fewkes and Barrois (*Paludina*), Collinge (*H. aspersa* and *Arion intermedius*), Simroth (*Vitrina* and *Agr. levis*).

The author describes a number of cases of variation in *Agr. levis* and many other molluscs.

Such observations as these only emphasise how important it is to establish really sound anatomical features for purposes of classification, and the absurdity of making new species upon slight variations.—W.E.C.

Baker, F. C.—Further notes on the Embryonic whorls of the *Muricide*. Proc. Acad. Nat. Sci. Philad., 1894, pp. 223-4.

Fischer, H.—Note sur le bras hectocolylisé de l'*Octopus vulgaris*, Lamarck. Journ. de Conchy., 1894, pp. 13-19, 1 fig.

Kishinouye, K.—Note on the eyes of *Cardium muticum*, Reeve. Journ. Coll. Sci. Imp. Univ. Japan., 1894, vol. vi., pp. 279-86, pl. ix.

Pace, S.—Notes on the Anatomy of *Bulinulus auris-sciuri*, Guppy. Proc. Malac. Soc. Lond., 1894, vol. i., pp. 151-2, figs.

Toel, K.—Poznamky o Bojanovu organu Trachovky *Sphærium rivicola*, Leach. Sitz. Gesel. d. wiss. Math.—Nat., Prag., 1894, pp. 1-7, T. vii.

Vayssière, A.—Etude de la *Scissurella costata*, var. *lævigata*. Journ. de Conchy., 1894, pp. 19-29, pl. ii.

Woodward, M. F.—On the Anatomy of *Pterocera*. Proc. Malac. Soc. Lond., 1894, vol. i., pp. 143-50, pl. xi.

CLASSIFICATION, NOMENCLATURE, NEW GENERA AND SPECIES.

Ancey, C. F.—Résultat des recherches malacologiques de Mgr. Lechaptois sur les bords du lac Nyassa et de la rivière Shiré. Mém. Soc. Zool. France, 1894, T. vii., pp. 217-34.

New species of *Achatina*, *Unio*, *Spathella*, and *Mutela*.

Brot, A.—On some new species of *Melania* from Palawan and the neighbourhood. Proc. Malac. Soc., Lond., 1894, vol. i., pp. 175-77, figs. 1-6.

Collinge, Walter E.—Description of a New Species of Slug of the genus *Janella*. Proc. Zool. Soc., Lond., 1894, pp. 526-30, fig. 5.

"*Janella maculata*, sp. nov.

Animal much flatter than *J. bitentaculata*. Dorso-median groove distinct and continuous to the tip of the tail. Ground-colour dirty yellow, with numerous irregular black spots and dashes; a large, black, oval-shaped mark immediately behind the pulmonary orifice. Head slightly lighter than the rest of the body. Foot dirty yellow, marginal portions distinct from median plane. Pulmonary orifice small and inconspicuous. Length in alcohol 33 millim.

Habitat.—Forty Mile Bush, North Island, New Zealand (H. Suter)."

This species differs from *J. bitentaculata* in the form and length of the free oviduct and penis, the shortness of the common duct, the form and divisions of the hermaphrodite gland, the distinct form of the albumen-gland, and the minor differences in the liver, colour of the animal, and general flattened form of the whole of the body.

Coutagne, G.—Les Cyclostomes de la Faune Française. Feu. Jeun. Nat., 1894, No. 287, pp. 170-2.

The author states there are three species of *Cyclostoma* in France, viz., *C. asteum*, Bgt., *C. elegans*, Müll., and *C. sulcatum*, Drap. [*C. asteum* appears to be only a smooth form of *C. elegans*.]

Dautzenberg, Ph.—Descr. d'un Hélicéen nouv. prov. de la cote occidentale du Maroc. Bull. Soc. Zool., France, 1894, T. xix, p. 17.

Fleck, Ed.—Notiz zu *Helix (Dorcasia) alexandri*, Gray.

Ber. Senck. Nat. Ges. Frankf., 1894, pp. 94-5.

Hedley, C.—On some naked Australian Marine Mollusca, pt. i. Proc. Linn. Soc. N.S.W., vol. ix., pp. 126-8, pl. vii.

Oscanius hilli is a new species, most nearly allied to *O. tuberculatus* from the Mediterranean.

Hedley, C.—*Calliostoma purpureocinctum*, n. sp. *Ibid.*, pp. 35-36.

Henn, Arnold U., and Brazier, John.—List of Mollusca found at Green Point, Watson's Bay, Sydney. *Ibid.*, pp. 165-182, pl. xiv.

A very remarkable collection of 1,376 specimens of 155 species, all from one bottle full of shingle and sand! The following are new species: *Peristernia* 1, *Clathurella* 1, *Vanikoro* 1, *Turbonilla* 1, *Eulimella* 1, *Odostomia* 2 [*indistincta* is already preoccupied in *Odostomia*], *Bittium* 1, *Triferis* 1, *Rissoia* 2, *Homalogyra* 1, *Glyphis* 1, *Puncturella* 1, and *Marginella* 1.

Jousseau, F.—Description d'une coquille nouvelle. Le Nat., 1894, p. 186.
A new *Axina*.

Jousseau, F.—Descriptions des coquilles nouvelles. *Ibid.*, pp. 201-2.

Jousseau, F.—Descriptions des Mollusques nouveaux. *Ibid.*, pp. 228-9.
Two new Japanese bivalves.

Jousseau, F.—Moll. recueillis à Ceylan par M. E. Simon, et revision générale des espèces terr. e. fluo.-lacustres de cette île. Mém. Soc. Zool. France, 1894, T. vii., pp. 264-300, pl. iv.

A general review of the described forms. The following are new: *Vitrea* 1, *Trichia* 1, *Microcystis* 1, *Euplectella* 1, *Plectophyllis* 2, *Hygromia* 1, *Opeas* 1, *Glossula* 1, *Phengus* 1, and *Cyathopoma* 1.

Kobelt.—Systematisches Conchylien—Cabinet, Lief 409 (Oct. 1894).

Contains part of the *Achatinidae* (vol. i., Heft. cxxiv., pp. 73-104, T. 24-29).

Melville, J. C.—Description of a new sp. of *Engina* (*E. epidromideae*) from Bombay. Proc. Malac. Soc. Lond., 1894, vol. i., p. 162, fig.

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EDITOR'S NOTES.

I trust that those malacologists who have so generously supported my efforts in the past will continue to support those of Mr. Webb and myself in the future, so that volume iii. when complete may be a great advance upon either of its predecessors.

One of the main features of the Journal—the "Bibliography"—will be continued and made even more complete than in the past. To those authors who have assisted in the past I am deeply grateful, and especially to Mr. E. R. Sykes for his labours in this department.



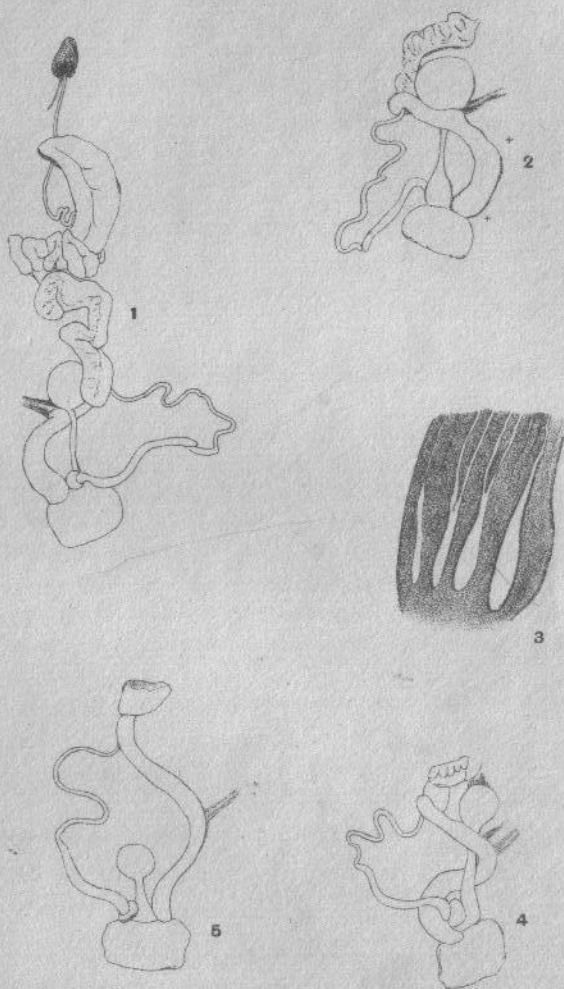


Fig. 1.—Reproductive organs of *Arion citrinus*, Westerl. ♂
 Fig. 2.—Their terminal ducts from the opposite side. $\frac{2.5}{1}$
 Fig. 3.—Inside portion of the oviduct in part $\times \times$ fig. 2.
 Fig. 4.—The terminal ducts of the typical *fuscus*, Müll.
 Fig. 5.—The terminal ducts of *A. fuscus*, v. *boettgeri*, Poll.